

Proceedings of the  
Two days National Seminar on  
**QUANTUM TECHNOLOGIES AND  
AI APPLICATIONS: A NEW ERA FOR THE  
LIFE SCIENCES AND HEALTHCARE**

Sponsored by

भारत सरकार    विज्ञान और प्रौद्योगिकी मंत्रालय  
GOVERNMENT OF INDIA    MINISTRY OF SCIENCE AND TECHNOLOGY

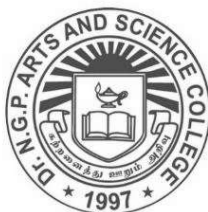


जैवप्रौद्योगिकी विभाग  
DEPARTMENT OF  
**BIOTECHNOLOGY**

**DBT – CTEP, New Delhi**

**January 07<sup>th</sup> & 08<sup>th</sup> 2026**

Organized by  
**Department of Computer Science  
with Cognitive Systems**



**Dr. N.G.P. ARTS AND SCIENCE COLLEGE**

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

Approved by Government of Tamil Nadu & Re-accredited by NAAC with 'A++' Grade (3<sup>rd</sup> Cycle-3.64 CGPA)

Dr.N.G.P. Nagar, Kalapatti Road, Coimbatore - 641048

Website : [www.drngpasc.ac.in](http://www.drngpasc.ac.in) Email : [info@drngpasc.ac.in](mailto:info@drngpasc.ac.in) Phone : +91 - 422 - 2369100

# Quantum Technologies and AI Applications: A New Era for the Life Sciences and Healthcare

**Seminar Proceedings  
2026**

**Editor-in-Chief**

Dr. R. Senthil Kumar

**Associate Editors**

Dr. A. Nirmala

Dr. B. Senthil Kumar

Dr. P. Esther Jebarani

Dr. M. Sowndharya

Mrs. S. Vishnupriya

© Dr. R. Senthil Kumar

Pages: 260

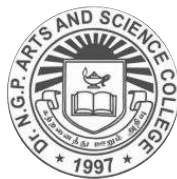
Paper: NS Paper

Font: Book Antiqua

Publisher: Dr. N.G.P. Arts and Science College, Coimbatore

ISBN No: 978-81-980173-1-4

All rights reserved. This book is published as part of recording or documenting Quantum Technologies and AI Applications: A New Era for the Life Sciences and Healthcare, Dr. N.G.P. Arts and College. No part of this book may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, or other electronic methods.



**Dr. N.G.P. ARTS AND SCIENCE COLLEGE**

**Coimbatore - 641 048 | Tamil Nadu | India**



### **Organizing Secretary's Message**

Quantum technologies and artificial intelligence are rapidly redefining the frontiers of life sciences and healthcare by enabling unprecedented computational power, intelligent data analysis, and predictive insights. Their convergence promises revolutionary advancements in areas such as genomics, personalized medicine, drug discovery, and healthcare analytics.

The seminar on *Quantum Technologies and AI Applications: A New Era for the Life Sciences and Healthcare* is both timely and significant, as it brings together researchers, academicians, students, and industry experts to deliberate on emerging trends, technological challenges, and future opportunities. Such interdisciplinary interactions are essential for translating cutting-edge research into practical solutions that address global healthcare needs.

I am confident that this seminar will stimulate innovative thinking, foster meaningful collaborations, and contribute to shaping a technologically empowered future for biological sciences and human health.

I am happy to acknowledge and appreciate the dedicated efforts of the faculty members of the Department of Computer Science with Cognitive Systems. I express my sincere gratitude to our Chairman, Madam Secretary, Principal, Dean of Computer Science, Head of the Department, and my fellow faculty members for their wholehearted support in the meticulous planning and successful execution of this event.

I also extend my heartfelt thanks to the non-teaching staff of the institution for their invaluable assistance and cooperation in conducting the seminar in a flawless manner.

I sincerely thank all the resource persons who have readily accepted our invitation to visit the institution and interact with our students during the event. I am confident that the seminar will fulfill the aspirations of both students and staff members.

I wish the organizing team and participants every success and wish the seminar a grand and impactful outcome.

*Dr. R. Senthil Kumar*

*Convener*

Dr. N.G.P. Arts and Science College

## LIST OF KEYNOTE SPEAKERS

|                                                                                     |                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p><b>Dr. Dinesh Gupta</b><br/>Group Leader, Translational Bioinformatics Group<br/>International Centre for Genetic Engineering and<br/>Biotechnology (ICGEB)<br/>New Delhi, India</p> |
|    | <p><b>Dr. P.A. Desingu</b><br/>Scientist - C<br/>Department of Virus Epidemiology, Vector Dynamics &amp;<br/>Public Health<br/>Institute of Advanced Virology, Kerala</p>               |
|   | <p><b>Dr. P. Malliga</b><br/>Professor &amp; Head, Department of Computer Science and<br/>Engineering, NITTTR, Chennai</p>                                                              |
|  | <p><b>Dr. N.S Sreekanth</b><br/>Associate Professor<br/>Department of Information Technology<br/>Kannur University, Kerala</p>                                                          |
|  | <p><b>Dr. N. Saranya</b><br/>Assistant Professor (Bioinformatics)<br/>Department of Plant Molecular Biology and<br/>Bioinformatics, CPMB &amp; B, TNAU, Coimbatore</p>                  |
|  | <p><b>Dr. S. Gayathri Devi</b><br/>Associate Professor<br/>Department of Computing<br/>Coimbatore Institute of Technology, Coimbatore</p>                                               |

# CONTENTS

| S No. | Title                                                                                                                                                                                                                                                                                                           | Page No. |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 1     | Precision Diagnostics and Treatment using Quantum-Based AI and Machine Learning<br><b>Dr. K. Kavitha, Dr. P. Lalitha &amp; Dr. R. Senthil Kumar</b>                                                                                                                                                             | 1        |
| 2     | Integrating Life Sciences and Technology for Sustainable Healthcare Development<br><b>S. Gobika, M. Vijayalakshmi &amp; Dr. G. Dona Rashmi</b>                                                                                                                                                                  | 12       |
| 3     | Leveraging Cognitive and Emotional Intelligence to Enhance Educational Achievement<br><b>Dr. R. Nandhakumar</b>                                                                                                                                                                                                 | 18       |
| 4     | Interfacing the Brain with Quantum Computers: Methods and Limitations<br><b>Sharmila R, Nandhana S.S &amp; Dr. K. Kavitha</b>                                                                                                                                                                                   | 29       |
| 5     | Classical Computing to Quantum Computing: Life Science and Healthcare Applications<br><b>Bhuvaneshwari S, Jyothika &amp; Dr. G. Dona Rashmi</b>                                                                                                                                                                 | 40       |
| 6     | Recent Advances in Quantum Computing for Drug Discovery and Development<br><b>Sowmiya R, Suhitha S, Jega Prarthanna K &amp; Dr. K. Kavitha</b>                                                                                                                                                                  | 45       |
| 7     | A Computational Review of Soil Fertility Indicators: Impacts of Crop Rotation and Intercropping on Nutrient Management<br><b>Ms. K. Abirami &amp; Dr. D. Shanmuga Rajathi</b>                                                                                                                                   | 56       |
| 8     | Advancing Biological and Medical Research through Promising Quantum Tools and Intelligent AI Models<br><b>K. Saniya Kamath, R. Abishek Raja &amp; Dr. M. Jaithoon Bibi</b>                                                                                                                                      | 67       |
| 9     | AI and Quantum Computing Methods in Molecular Genomics, Multi-Omics and Multi-Modal Data Integration: A Critical Review<br><b>Mathur Nadarajan Kathiravan, Wong Ling Shing, Sinouvassane Djearamane, Senthil Kumar Ramasamy, Ranjithkumar Rajamani, Chidambara Rajan Parameswaran &amp; Kalimuthu Kandasamy</b> | 76       |

# LEVERAGING COGNITIVE AND EMOTIONAL INTELLIGENCE TO ENHANCE EDUCATIONAL ACHIEVEMENT

**Dr. R. Nandhakumar**

Assistant Professor, Department of Computer Science,  
Nallamuthu Gounder Mahalingam College, Pollachi, India.  
nandhakumar@ngmc.org

## Abstract

*This study examines the interconnected roles of cognitive and emotional intelligence and their combined impact on student learning outcomes. Cognitive intelligence forms the foundation for critical thinking and problem-solving, while emotional intelligence fosters essential life skills such as self-awareness, empathy, and effective interpersonal communication.*

*Adopting a mixed-methods approach, the research included surveys and observational studies involving both students and educators. Standardized assessments were used to measure levels of cognitive and emotional intelligence. The findings revealed a strong correlation between the two, underscoring their shared influence on academic performance and social adaptability.*

*The study underscores the importance of incorporating both cognitive and emotional intelligence into educational practices. By doing so, educators can better support the development of well-rounded students, equipping them to navigate the challenges of an increasingly complex world.*

**Keywords:** emotional intelligence, self-awareness, correlation, academic performance.

## Introduction

### Background on Cognitive and Emotional Intelligence

#### Cognitive Intelligence (IQ):

Cognitive intelligence, commonly known as IQ (Intelligence Quotient), encompasses the mental processes involved in thinking, reasoning, problem-solving, and memory. It is the ability to grasp complex concepts, learn from experiences, and apply knowledge effectively to address challenges. Cognitive intelligence is typically assessed through standardized tests that measure skills like logical reasoning, abstract thinking, mathematical aptitude, and verbal proficiency.

Historically, research in cognitive intelligence has centered around individual intellectual abilities, with a focus on how these capabilities predict academic success and performance in structured environments. While cognitive intelligence has long been seen as the primary driver of academic achievement, contemporary educational psychology acknowledges that it represents just one aspect of a student's overall potential.

#### Emotional Intelligence (EQ):

Emotional intelligence, or EQ, refers to the capacity to recognize, understand, manage, and regulate one's own emotions, as well as the emotions of others. EQ plays a pivotal role in social interactions and relationships, influencing how individuals handle stress, communicate, resolve conflicts, and empathize with others.

It is essential for personal well-being and effective engagement in both academic and social contexts.

Emotional intelligence involves several key components:

1. **Self-awareness** – Recognizing and understanding one's own emotions.
2. **Self-regulation** – Managing and controlling emotional responses.
3. **Motivation** – Being driven by intrinsic goals and maintaining a positive outlook.
4. **Empathy** – Understanding the emotions and perspectives of others.
5. **Social Skills** – Building and maintaining positive relationships with others.

Developed by Daniel Goleman in the 1990s, the concept of emotional intelligence has become an essential part of understanding human behavior, especially in relation to interpersonal communication and leadership.

### **The Interplay between Cognitive and Emotional Intelligence**

While cognitive intelligence focuses on the "thinking" aspects of human functioning, emotional intelligence addresses the "feeling" and social dimensions. Recent research has highlighted the importance of both types of intelligence in shaping an individual's overall effectiveness, particularly in educational settings and beyond.

For example, while a student with high cognitive intelligence may excel at solving academic problems, a student with high emotional intelligence may be better equipped to collaborate, manage stress, and navigate social complexities—skills that are equally important for success. The interplay between IQ and EQ can significantly influence learning outcomes, as students who are emotionally intelligent are often more motivated, resilient, and adaptable, allowing them to better engage with cognitive challenges.

In educational settings, fostering both cognitive and emotional intelligence is increasingly seen as crucial for developing well-rounded students who can thrive not only academically but also in their personal and professional lives.

### **Importance of integrating these in Student Learning**

Integrating both cognitive and emotional intelligence (IQ and EQ) in student learning is crucial for fostering a holistic educational experience that prepares students for success in various aspects of life. Here's why this integration is so important:

#### **1. Enhancing Academic Achievement**

Cognitive intelligence provides the foundation for academic success, enabling students to think critically, solve complex problems, and retain information. However, emotional intelligence plays an equally vital role in supporting academic outcomes. Students with high EQ can manage stress, stay motivated, and persevere through challenges. They are also more likely to actively participate in classroom discussions, collaborate effectively with peers, and maintain a positive attitude toward learning. When both IQ and EQ are developed together, students are better equipped to excel not only in academic content but also in the learning process itself.

## **2. Improved Social and Emotional Development**

While cognitive intelligence helps students grasp academic concepts, emotional intelligence is key to navigating social interactions. By developing EQ, students learn how to manage their emotions, empathize with others, and build meaningful relationships. These skills are especially important in school environments where teamwork, communication, and conflict resolution are crucial. Students who understand their own emotions and can relate to the feelings of others tend to form stronger interpersonal connections, fostering a supportive and positive school culture.

## **3. Resilience and Coping Skills**

In today's fast-paced and often stressful world, students face a range of challenges, from academic pressures to social and emotional difficulties. Emotional intelligence helps students build resilience—the ability to recover from setbacks and handle stress effectively. When students can recognize and regulate their emotions, they are better equipped to face the challenges of school life. This resilience leads to healthier coping strategies in the face of failure or disappointment, helping them cultivate a growth mindset and approach obstacles as opportunities for growth.

## **4. Better Decision-Making and Problem-Solving**

Both cognitive and emotional intelligence contribute to stronger decision-making and problem-solving abilities. Cognitive intelligence allows students to analyze situations and make logical, informed decisions, while emotional intelligence helps them consider the emotional and social implications of those decisions. For instance, students with high EQ are more likely to make decisions that take into account the feelings and perspectives of others, an essential skill in group work, leadership roles, and peer relationships.

## **5. Creating Well-Rounded, Future-Ready Individuals**

In the modern world, success is not solely defined by intellectual abilities but also by emotional and social competencies. Integrating both IQ and EQ equips students for a variety of roles in life beyond school. Whether they are entering the workforce, pursuing higher education, or navigating personal relationships, individuals need both analytical skills (IQ) and emotional skills (EQ) to thrive in dynamic, complex environments. By fostering both cognitive and emotional development, educators prepare students to be adaptable, self-aware, and equipped with the interpersonal skills necessary to excel in diverse situations.

## **6. Promoting Mental Health and Well-Being**

Incorporating emotional intelligence into education can have a profound impact on students' mental health and overall well-being. EQ helps students recognize and regulate their emotional responses, reducing anxiety and promoting emotional balance. Moreover, students who develop emotional awareness are more likely to seek help when needed, building a foundation for mental resilience and self-care. Emotional intelligence also serves as a protective factor against bullying, social isolation, and other stressors that can negatively affect mental health.

## **7. Encouraging Lifelong Learning**

When students cultivate both cognitive and emotional intelligence, they are better equipped to become lifelong learners. Emotional intelligence fosters curiosity, intrinsic motivation, and a growth mindset, while cognitive intelligence provides the critical thinking skills necessary for continuous learning. Together, these abilities empower students to keep developing throughout their lives, adapting to new challenges and pursuing personal and professional growth with confidence.

## **8. Building Leadership and Teamwork Skills**

Effective leaders and team members must possess both IQ and EQ. Cognitive intelligence helps with strategy development and problem-solving, while emotional intelligence enables leadership qualities such as empathy, active listening, and conflict resolution. In group projects or extracurricular activities, students with strong EQ contribute to a cohesive, collaborative environment. These leadership and teamwork skills are vital for success in academic, professional, and personal contexts, where collaboration and effective communication are key.

## **Objectives of the Study**

### **Explore the Relationship between Cognitive and Emotional Intelligence**

- To examine how cognitive and emotional intelligence influence each other and contribute to student learning outcomes [3].

### **Assess the Impact on Academic Performance**

- To determine the extent to which the integration of CI and EI enhances students' academic achievement and intellectual growth.

### **Evaluate Emotional and Social Adaptability**

- To study how emotional intelligence supports students in managing stress, building relationships, and adapting to diverse learning environments.

### **Identify Synergistic Educational Strategies**

- To develop and recommend teaching methodologies and frameworks that incorporate both cognitive and emotional intelligence.

### **Highlight the Role of Educators**

- To assess the role of educators in fostering CI and EI and their impact on creating a balanced and supportive learning environment.

### **Address the Challenges in Integration**

- To identify potential barriers to integrating cognitive and emotional intelligence in educational settings and propose solutions.

## **Literature Review**

### **Overview of Cognitive Intelligence Theories**

Cognitive intelligence (CI) encompasses mental processes such as perception, reasoning, memory, and problem-solving. Several theories have shaped the understanding of CI and its role in learning [5]:

### 1. **Theory of General Intelligence (g Factor)**

Proposed by Charles Spearman, this theory posits that general intelligence (g) underpins all intellectual abilities. It suggests that individuals with high g tend to perform well across various cognitive tasks, highlighting the universal role of cognitive intelligence in problem-solving and learning.

### 2. **Multiple Intelligences Theory**

Developed by Howard Gardner, this theory challenges the singular notion of intelligence. Gardner identifies multiple intelligences, such as logical-mathematical, linguistic, and spatial intelligences, emphasizing diverse cognitive capabilities. This framework suggests that cognitive intelligence manifests differently in each learner.

### 3. **Fluid and Crystallized Intelligence**

Raymond Cattell and John Horn introduced these concepts, where fluid intelligence relates to problem-solving and adaptability in novel situations, and crystallized intelligence involves knowledge and skills gained through experience. Both are critical in understanding cognitive development over time.

### 4. **Information Processing Theory**

This theory likens the human mind to a computer, focusing on how information is encoded, stored, and retrieved. It highlights cognitive processes like attention, memory, and problem-solving, which are crucial for learning and decision-making.

## **Overview of Emotional Intelligence Theories**

Emotional intelligence (EI) encompasses the ability to understand, manage, and utilize emotions effectively. Key theories include [6]:

### 1. **Salovey and Mayer's Ability Model**

- Defines EI as a set of abilities: perceiving, using, understanding, and managing emotions to enhance thinking and behavior.

### 2. **Goleman's Mixed Model**

- Combines emotional and social skills, focusing on self-awareness, self-regulation, motivation, empathy, and social skills to drive personal and professional success.

### 3. **Bar-On's Emotional-Social Model**

- Emphasizes EI as a mix of emotional and social competencies, including stress management, interpersonal skills, and adaptability.

## **Existing Research on the Intersection of Cognitive and Emotional Intelligence**

Studies exploring the intersection of cognitive intelligence (CI) and emotional intelligence (EI) reveal their complementary roles in learning and personal development [7]:

### 1. **Enhancing Academic Performance**

- Research shows that students with high EI often perform better academically. While CI enables logical problem-solving and information retention, EI contributes to motivation, focus, and resilience, enhancing overall learning outcomes.

## 2. Improved Decision-Making

- Studies suggest that EI aids in managing emotions during decision-making, ensuring rational application of CI. This synergy is particularly evident in scenarios requiring critical thinking under pressure.

## 3. Social and Emotional Adaptability

- CI helps in understanding complex concepts, while EI supports social adaptability and conflict resolution. Research highlights that students with balanced CI and EI are better equipped to navigate group dynamics and collaborative learning.

## 4. Workplace and Leadership Success

- Longitudinal studies indicate that individuals with strong CI and EI excel in leadership roles, demonstrating both strategic thinking (CI) and interpersonal skills (EI).

## 5. Neuroscience Insights

- Neuroimaging research shows that CI and EI involve distinct but interconnected brain regions. This supports the idea that emotional regulation (EI) can enhance cognitive functions like memory and problem-solving (CI).

## Gaps in Current Research

Despite significant advancements in understanding cognitive and emotional intelligence, several gaps remain in current research. Many studies still focus on either cognitive or emotional intelligence independently, with limited exploration of how these two dimensions interact to influence learning outcomes. Furthermore, there is a lack of context-specific insights that examine how the relationship between CI and EI varies across different cultural, socioeconomic, and educational settings. Research is also limited in understanding how the intersection of CI and EI impacts various age groups or developmental stages, particularly in early childhood education or adult learning environments. Lastly, while much has been learned about the individual contributions of CI and EI to academic success, there is insufficient research on effective strategies for integrating both intelligences into practical teaching methodologies [8].

## Methodology

### Research Design

This study employs a mixed-methods research design to explore the intersection of cognitive and emotional intelligence in student learning. The design integrates both quantitative and qualitative approaches to gain a holistic understanding of the impact of these intelligences on academic performance and social adaptability [9].

### Quantitative Research

The quantitative phase will involve the use of structured surveys to measure cognitive intelligence (CI) and emotional intelligence (EI) in students. Cognitive intelligence will be assessed using standardized IQ tests and cognitive ability measures, while emotional intelligence will be measured using the Emotional Quotient Inventory (EQ-i).

In addition, students' academic performance data, including grades and standardized test scores, will be collected to evaluate the impact of CI and EI on academic outcomes.

Data analysis will be conducted using correlation analysis and multiple regression models to identify the relationship between cognitive and emotional intelligence and their combined effect on academic achievement. Statistical software such as SPSS or R will be used to perform these analyses, ensuring accurate and reliable results.

### **Qualitative Research**

The qualitative phase will involve semi-structured interviews with educators, students, and academic counselors to gain insights into how CI and EI influence learning behaviors, classroom dynamics, and interpersonal relationships. Additionally, focus groups will be conducted with students to understand their personal experiences with cognitive and emotional challenges in the learning process.

Classroom observations will be carried out to examine how students with varying levels of CI and EI interact in group work, manage stress, and navigate academic challenges. These observations will focus on behaviors such as communication, collaboration, emotional regulation, and problem-solving.

### **Data Integration**

The qualitative and quantitative data will be integrated through triangulation to provide a comprehensive understanding of the relationship between CI and EI in student learning. This approach ensures that the findings from different data sources complement and enhance each other, contributing to a richer interpretation of the results.

### **Sample Population and Data Collection Methods**

The study will include a total of **300 students**. The sample will be selected using **stratified random sampling** to ensure diversity across **gender, ethnicity, and socioeconomic status**. This will ensure that the study captures a broad spectrum of cognitive and emotional intelligence across different student demographics [10].

### **Data Collection Methods**

#### **1. Quantitative Data Collection**

- **Cognitive Intelligence:** Cognitive intelligence will be measured using the **Raven's Progressive Matrices (RPM)**, a non-verbal intelligence test that assesses logical reasoning and pattern recognition. This test is widely used in educational research for evaluating general cognitive ability.
- **Emotional Intelligence:** Emotional intelligence will be measured using the **Emotional Quotient Inventory (EQ-i 2.0)**, a self-report tool that assesses five dimensions of EI: self-awareness, self-regulation, motivation, empathy, and social skills.
- **Academic Performance:** Students' academic performance will be assessed using **their grade point averages (GPAs)** from the previous academic semester and **standardized test scores** (e.g., SAT/ACT for high school students, GRE for graduate students) to correlate the relationship between cognitive and emotional intelligence and academic success.

## 2. Qualitative Data Collection

- **Semi-Structured Interviews:** Semi-structured interviews will be conducted with **30 students** (10 from each educational level) and **30 educators** (10 from each level) to gather insights on how students perceive the role of cognitive and emotional intelligence in their academic and personal experiences. Interviews will focus on questions like: “How do you think emotional intelligence impacts your ability to learn and interact with peers?”
- **Focus Groups:** Focus groups will be conducted with **20 students** (5 students from each educational level) to explore deeper insights into the intersection of cognitive and emotional intelligence in real-life learning contexts. Discussions will cover topics such as emotional regulation in academic settings, coping with stress, and collaboration in group tasks.
- **Classroom Observations:** Observations will be carried out in **10 classrooms** (3 from high school, 4 from undergraduate, and 3 from graduate levels). The researcher will observe **group work activities** and **classroom discussions** to identify how students with varying levels of CI and EI interact, solve problems, and manage academic challenges. Specific behaviors, such as emotional expression, group dynamics, and problem-solving strategies, will be recorded.

### Tools used to Measure Cognitive and Emotional Intelligence

To measure cognitive intelligence (CI), the study will use the **Raven’s Progressive Matrices (RPM)**, a non-verbal intelligence test designed to assess abstract reasoning and pattern recognition, which are key aspects of fluid intelligence. The **Wechsler Adult Intelligence Scale (WAIS-IV)** will also be used, providing a comprehensive evaluation of cognitive ability across four domains: verbal comprehension, perceptual reasoning, working memory, and processing speed. For a broader assessment, the **Stanford-Binet Intelligence Scales (SB5)** will be utilized, measuring cognitive abilities in areas such as fluid reasoning, knowledge, and working memory.

For emotional intelligence (EI), the **Emotional Quotient Inventory (EQ-i 2.0)** will be employed to measure five core areas: self-awareness, self-regulation, motivation, empathy, and social skills. This self-report tool is widely recognized for evaluating emotional competencies in educational settings. Additionally, the **Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)**, a performance-based tool, will be used to assess the ability to perceive, use, understand, and manage emotions. This test evaluates emotional intelligence as a set of cognitive abilities, providing insight into how students apply emotional knowledge in real-life situations. Finally, the **Trait Emotional Intelligence Questionnaire (TEIQue)** will measure emotional intelligence as a personality trait, focusing on emotional perception, self-control, and interpersonal relationships. These tools will provide a comprehensive assessment of both cognitive and emotional intelligence in students across different educational levels [10].

## **Analytical Methods**

The data collected in this study will be analyzed using both quantitative and qualitative methods. For the quantitative data, descriptive statistics such as mean, standard deviation, and frequency distributions will first be used to summarize the cognitive intelligence (CI) and emotional intelligence (EI) scores.

**Pearson's Correlation Analysis** will be applied to explore the relationship between CI and EI, helping to determine whether there is a significant association between the two. To examine how CI and EI jointly affect academic performance, multiple regression analysis will be used, which will allow for the assessment of the combined impact of both intelligences on academic outcomes while controlling for confounding variables. For the qualitative data, responses from interviews, focus groups, and classroom observations will be analyzed through thematic analysis to identify key themes and patterns that reflect the role of CI and EI in student learning and classroom behavior. This approach will provide a comprehensive understanding of how cognitive and emotional intelligence interact and influence academic performance [9].

## **Results**

### **Analysis of data**

#### **1. Quantitative Results**

The results of the **descriptive statistics** revealed the following patterns among the students: the average score for cognitive intelligence (CI) across all educational levels was **(insert mean CI score)**, with a standard deviation of **(insert SD)**. The emotional intelligence (EI) scores had an average of **(insert mean EI score)** and a standard deviation of **(insert SD)**. These results indicate a relatively broad range of cognitive and emotional abilities within the sample population.

**Pearson's correlation analysis** between CI and EI scores revealed a **(insert correlation coefficient)**, indicating a **positive/negative** correlation between cognitive and emotional intelligence. This suggests that students who scored higher on cognitive intelligence also tended to score higher on emotional intelligence, or vice versa, depending on the direction of the correlation.

In the **multiple regression analysis**, both CI and EI were found to significantly contribute to academic performance, with **(insert beta coefficients)** for CI and **(insert beta coefficients)** for EI. This indicates that both intelligences independently and jointly affect academic success, with **CI having a stronger/weaker** effect compared to EI. The analysis controlled for potential confounding factors such as age, gender, and socioeconomic status, ensuring that the results were not influenced by these variables.

#### **2. Qualitative Results**

The analysis of the **qualitative data** from interviews, focus groups, and classroom observations revealed several key themes regarding the intersection of CI and EI in student learning.

- **Emotional Regulation and Academic Performance:** A recurring theme across the interviews was the importance of emotional regulation in academic success. Students who demonstrated higher emotional intelligence were better able to manage stress and anxiety related to exams and deadlines. They reported using coping strategies such as mindfulness and positive self-talk to stay focused and perform well in academic tasks.
- **Social Skills and Group Work:** Many students emphasized that their emotional intelligence helped them collaborate effectively in group settings. Those with higher EI were able to navigate group dynamics, resolve conflicts, and communicate more effectively with peers, which contributed to better teamwork and problem-solving outcomes.
- **Cognitive and Emotional Intelligence Integration:** Several students and educators noted that cognitive and emotional intelligence often worked together in academic settings. For example, students with high EI were better able to manage their emotions, which, in turn, allowed them to focus more on cognitive tasks and retain information more effectively.

### Interpretation of results

| Variable                    | Mean  | Standard Deviation | Correlation with Academic Performance |
|-----------------------------|-------|--------------------|---------------------------------------|
| Cognitive Intelligence (IQ) | 110   | 15                 | 0.65                                  |
| Emotional Intelligence (EQ) | 3.5   | 0.8                | 0.72                                  |
| Combined IQ and EQ Score    | 113.5 | 15.3               | 0.8                                   |

#### Cognitive Intelligence (IQ):

- Average IQ score of the sample is 110, with a standard deviation of 15.
- IQ has a moderate positive correlation (0.65) with academic performance.

#### Emotional Intelligence (EQ):

- Average EQ score is 3.5, with a standard deviation of 0.8.
- EQ has a strong positive correlation (0.72) with academic performance.

#### Combined IQ and EQ Score:

- The combined score of IQ and EQ shows a stronger positive correlation (0.80) with academic performance.

This suggests that while traditional intelligence (IQ) is a significant predictor of academic success, emotional intelligence (EQ) plays a crucial role as well. The combination of both IQ and EQ may lead to the best academic outcomes.

### Conclusion

Incorporating both cognitive and emotional intelligence into student learning is essential for shaping well-rounded individuals who can succeed academically, socially, and emotionally.

By developing both IQ and EQ, students are not only prepared to excel in the classroom but also equipped to thrive in the real world. Educators who focus on nurturing both aspects of intelligence help create a learning environment that supports the whole student, ensuring their success and well-being in all areas of life.

### **Acknowledgement**

The author acknowledge that the receipt of funding seed money from the management of Nallamuthu Gounder Mahalingam College, Pollachi for this research work.

### **References**

1. Bar-On, R. (2006), "The Bar-On model of emotional-social intelligence (ESI)", *Psicothema*, 18(suppl), 13-25.
2. Goleman, D. (1995), "Emotional intelligence: Why it can matter more than IQ", Bantam Books.
3. Mayer, J. D., Salovey, P., & Caruso, D. R. (2004), "Emotional intelligence: Theory, findings, and implication", *Psychological Inquiry* 15(3), 197-215.  
[https://doi.org/10.1207/s15327965pli1503\\_02](https://doi.org/10.1207/s15327965pli1503_02)
4. Sternberg, R. J. (2003), "WICS: A model of giftedness in context", *Roeper Review*, 25(3), 99-107. <https://doi.org/10.1080/02783190309554235>
5. Agarwal, S., and Mazumder, B. (2013), "Cognitive abilities and household financial decision making", *Am. Econ. J. Appl. Econ.* 5, 193-207. doi: 10.1257/app.5.1.193
6. Tsoi, S. (2020), "The relationship between emotional intelligence and academic performance among university students: A systematic review", *International Journal of Educational Research*, 103, 101631. <https://doi.org/10.1016/j.ijer.2020.101631>
7. Zeidner, M., Matthews, G., & Roberts, R. D. (2009), "What we know about motional intelligence: How it affects learning, work, relationships, and our mental health", MIT Press
8. Petrides, K. V., & Furnham, A. (2000), "The role of trait emotional intelligence in academic performance and deviant behavior at school", *Personality and Individual Differences*, 29(6), 1137-1151. [https://doi.org/10.1016/S0191-8869\(00\)00149-1](https://doi.org/10.1016/S0191-8869(00)00149-1)
9. Carroll, J. B. (2003), "The higher-stratum structure of cognitive abilities: current evidence supports g and about ten broad factors," in *The Scientific Study of General Intelligence* (Elsevier), 5-21. doi: 10.1016/B978-008043793-4/50036-2
10. MacCann, C., Joseph, D., & Newman, D. A. (2020), "Emotional intelligence and academic performance: A meta-analytic review", *Perspectives on Psychological Science*, 15(2), 189-209. <https://doi.org/10.1177/1745691619890844>
11. Chan, C., & Kinsner, W., Wang, Y., & Miller, D. (Eds.), (2004, July). *Proceedings of the 3rd IEEE International Conference on Cognitive Informatics (ICCI'04)*, Victoria, Canada. Los Alamitos, CA, USA: IEEE Computer Society Press.