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Emotional intelligence, self-regulated learning, and academic achievement in technology-mediated learning: a systematic literature review

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ABSTRACT

This study aims to synthesize empirical evidence on the role of emotional intelligence (EI) in supporting academic achievement within technology-mediated learning environments, addressing the current gap in fragmented findings and the lack of comprehensive reviews connecting EI with digital learning demands. Using the PRISMA 2020 protocol, a systematic literature review was conducted across Scopus, Web of Science, ERIC, and Google Scholar, covering empirical studies published between 2014 and 2024. From an initial pool of 500 records, 15 studies met the inclusion criteria and were analyzed thematically, with meta-analytic insights incorporated where effect-size data were available. The results indicate that EI enhances academic performance by strengthening self-regulated learning, motivation, emotional regulation, and collaborative engagement across online, blended, and asynchronous modalities. Challenges include inequitable digital access, insufficient teacher preparedness, and cultural constraints on emotional expression. The review contributes theoretically by proposing an integrated understanding of EI as both a cognitive facilitator and an affective buffer in digital learning ecosystems, highlighting its relevance for instructional design, teacher training, and policy development.

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1. Introduction

The digital transformation in education has significantly impacted how students interact with knowledge. Learning, which was previously centered in physical classrooms, has now shifted to more flexible and open learning spaces through online platforms. In this context, academic success no longer depends solely on intellectual ability but also on students' capacity to manage themselves emotionally and socially when facing the challenges of technology-based independent learning. However, various reports show that the shift to digital learning has introduced substantial emotional and psychological burdens for students. National surveys conducted during and after the transition to online learning reveal that more than 60% of students experienced increased stress and academic anxiety, primarily due to the lack of direct teacher support and overwhelming digital workloads [1]. Similarly, a study by UNICEF reported that 1 in 3 Indonesian learners struggled with motivation loss, and over 40% had difficulty maintaining focus and self-regulated learning habits during remote learning. Research conducted by the OECD (2021) further indicates that student engagement dropped significantly in digital settings, with many reporting fatigue, emotional exhaustion, and reduced peer interaction. These phenomena highlight that the emotional demands of online learning are not only real but also widespread, affecting students' academic performance and psychological

well-being. Emotional intelligence is defined as an individual's ability to recognize, understand, manage, and express emotions effectively in various situations. According to Mayer [3], emotional intelligence comprises four main components: emotional perception, emotional facilitation of thinking, emotional understanding, and emotional management. Furthermore, emotional intelligence also refers to an individual's ability to recognize, comprehend, and regulate their own emotions as well as those of others, and to utilize them in adaptive thinking and decision-making [4]. In the educational context, students with high emotional intelligence are generally better at adapting to academic pressure, communicating effectively, building healthy social relationships, and sustaining motivation. This is especially crucial in digital learning, where students must study independently, manage their time, and stay focused without physical teacher or peer presence. For students with weak emotional regulation, the digital environment often triggers stress, boredom, frustration, and feelings of isolation, which in turn reduce engagement and learning persistence. Thus, emotional intelligence becomes a key determinant of academic success in technology-mediated learning environments.

The importance of non-cognitive aspects in education has also drawn the attention of the Indonesian government. Through the Pancasila Student Profile policy, the Ministry of Education, Culture, Research, and Technology [1] has established six core competency dimensions for 21st-century learners: faith and noble character, independence, critical thinking, creativity, collaboration, and global diversity. Several of these dimensions, such as independence, collaboration, and noble character, are closely aligned with indicators of emotional intelligence, including empathy, interpersonal skills, and self-regulation. This alignment reinforces the relevance of emotional intelligence in shaping students' adaptability and resilience within today's digitally mediated learning ecosystem. The results of the National Assessment released by Kemendikbudristek show that schools with positive socio-emotional climates tend to achieve higher academic learning outcomes. This finding strengthens evidence that learning environments supporting emotional regulation, healthy interpersonal relationships, and intrinsic motivation play a key role in enhancing students' academic achievement.

The data in Table 1 reveal a consistent relationship between the quality of a school's socio-emotional climate and students' numeracy achievement. Schools with a high socio-emotional index generally foster a more supportive and inclusive learning environment, which encourages the development of interpersonal skills. In such environments, students experience psychological safety, feel their opinions are valued, and have space to express emotions healthily. This cultivates a conducive learning atmosphere that indirectly enhances academic performance. A positive socio-emotional environment has also been shown to strengthen students' intrinsic motivation. When students feel emotionally supported, they demonstrate better focus, take greater responsibility for their learning process, and exhibit increased perseverance in completing tasks. This is particularly crucial in the era of digital learning, where social interactions are often limited, and students must exercise greater self-regulation.

Table 1. Average Numeracy Scores Based on the School's Social-Emotional Climate Index

Socio-Emotional Index Category	Average Numeracy Score
Low	495
Medium	520
High	545

Source: Center for Assessment and Learning, Kemendikbudristek (2021).

Previous studies consistently show a positive correlation between emotional intelligence and academic achievement. Research by Ernawati et al., cited in Nurul Fadhilah & Mukhlis [5], indicates that emotional intelligence influences student learning outcomes. The findings demonstrate a significant relationship between emotional intelligence and academic performance, reinforcing the idea that emotional intelligence motivates students to explore their potential and seek personal growth. Additionally, research by Salovey, Mayer, and Goleman suggests that students with high emotional intelligence are more effective in managing stress, maintaining strong learning motivation, and building social relationships that support academic success [6]. Furthermore, a study by Iqbal [7] reveals that emotional intelligence plays a vital role in shaping students' learning attitudes. Students with high empathy and intrinsic motivation are more likely to collaborate effectively in groups and take responsibility for their learning, an aspect of emotional self-regulation often overlooked in academic discussions. EI

encourages emotional regulation and social skills, and transforms emotional energy into positive strength that supports consistent and adaptive learning attitudes during challenging online learning situations.

However, the shift toward digital learning has introduced new emotional demands that were less prominent in traditional classrooms. While online platforms offer flexibility and accessibility, they often lack emotional cues, immediate feedback, and peer support that help regulate students' affective experiences [8]. Students engaged in digital learning frequently report feelings of isolation, boredom, and emotional exhaustion, particularly during prolonged periods of distance learning. These challenges are exacerbated by the absence of spontaneous teacher-student interactions, which traditionally serve as a buffer against academic anxiety and disengagement. Moreover, according to Nur *et al* [9], digital learning impacts students' mental health, increasing academic pressure and feelings of isolation, leading to psychological issues such as stress, anxiety, mild depression, and even academic burnout. This phenomenon highlights that while technology brings progress, there are hidden consequences that must be addressed, particularly concerning students' mental health and emotional intelligence. In this context, emotional intelligence becomes even more critical, as students must self-regulate, maintain motivation, and cope with frustration without their usual social support systems. Iqbal *et al* [7] found that self-awareness and self-motivation, as core dimensions of emotional intelligence, have a direct and positive relationship with students' learning habits in a blended learning environment. These traits enable learners to regulate their emotions, maintain focus despite digital distractions, maintain a consistent independent study schedule, and recover from unexpected technical issues factors that collectively enhance academic performance in a technology-mediated learning context.

However, existing studies remain limited in scope, with many focusing on traditional classroom settings and failing to consider the distinct emotional demands of technology-mediated learning. Digital environments present challenges such as higher distraction, reduced social cues, and increased reliance on self-regulation, conditions that require more advanced emotional management skills. In addition, variations in how emotional intelligence is defined, measured, and analyzed across studies have resulted in fragmented findings that make it difficult to establish a coherent understanding of its role in digital learning. This review contributes by integrating these disparate results into a clearer conceptual explanation of how emotional intelligence influences academic achievement across online, blended, and asynchronous contexts. Methodologically, it maps variations in research designs and measurement practices, highlighting inconsistencies that future studies must address. Practically, the synthesized evidence provides guidance for digital instructional design, teacher emotional competence development, and policies aimed at strengthening socio-emotional support in technology-mediated education.

2. Method

Before This study employed a Systematic Literature Review and meta-analysis approach to collect and analyze previous research findings addressing the relationship between emotional intelligence and academic performance. This method enabled the systematic identification, synthesis, and quantitative integration of results through structured and replicable procedures, providing a comprehensive understanding of the association across different educational contexts [10]. All review stages were structured according to the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, which structure the systematic review process into several core processes, including search strategy, study selection, and article eligibility and inclusion assessment [11]. Details of each stage are presented in tabular form to facilitate reading and thorough analysis. The search strategy was conducted through Scopus, Web of Science, ERIC, and Google Scholar databases, using specific keyword combinations and predetermined inclusion and exclusion criteria. The selected articles were then analyzed thematically, and the process flow is presented in the PRISMA diagram in Fig. 1.

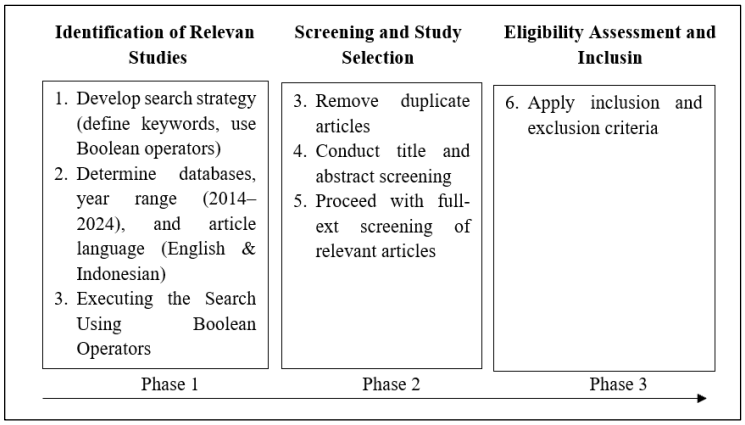

Fig. 1. Three Phases of the Systematic Literature Review Process

2.1 Identification of Relevant Studies

The first step in the Systematic Literature Review (SLR) process is to develop a search strategy for identifying scientific articles relevant to the research topic. This strategy is systematically designed to identify studies that directly examine the relationship between emotional intelligence and academic achievement within the context of digital learning. At this stage, researchers formulate primary keywords based on core theoretical concepts and research variables. These keywords are then expanded into search strings using Boolean operators such as AND and OR to produce search combinations that are both broad and precise. This technique is intended to capture various synonyms and term variations commonly used in academic literature. With this strategy, researchers can ensure that the identified articles not only include the main but also account for terminological variations frequently found across education and educational psychology literature. This is essential to minimize the risk of overlooking relevant studies due to differences in terminology among authors or journals. To ensure replicability, the search strategy was explicitly defined prior to the screening phase and applied consistently across all targeted academic databases. In this step, the researcher selected several academic databases to ensure the comprehensiveness and credibility of the literature search. The databases used in this study were Scopus**,** Web of Science, ERIC**,** and Google Scholar**.** These platforms were chosen due to their wide indexing coverage, relevance to educational research, and accessibility of peer-reviewed publications. The search was limited to articles published between 2014 and 2024 to ensure the relevance and currency of the findings. Only articles written in English and Indonesian were considered, with a focus on empirical research that had undergone a peer-review process. This limitation was intended to maintain consistency in language comprehension and methodological rigor across the selected studies. After determining the keywords and selecting the databases, the search was executed using Boolean operators such as AND and OR**.** These operators were used to combine the main variables of the study: emotional intelligence**,** academic achievement**,** and digital learning to produce structured search strings. The search strings were applied consistently across all selected databases, including Scopus, Web of Science, ERIC, and Google Scholar. This strategy ensured that the articles retrieved were both broad in scope and relevant to the research focus. The complete search structure is presented in Table 2.

Table 2. Search Strings and Parameters Used in Literature Search

Conceptual Focus	Keywords / Search Strings
Emotional Intelligence	"emotional intelligence" OR "EQ" OR "emotional awareness" OR "self-regulation"
Academic Achievement	"academic achievement" OR "academic performance" OR "learning outcome"
Digital Learning	“digital learning" OR "online learning" OR "blended learning" OR "distance education"
Boolean Combination	("emotional intelligence" AND "academic achievement") AND ("digital learning" OR "online learning")
Year Range	2014 – 2024
Language	English and Indonesian
Conceptual Focus	Keywords / Search Strings

2.2 Screening and Study Selection

After executing the search across four academic databases, a total of 500 articles were collected. Some of these entries were duplicated across different sources. To ensure the accuracy and validity of the dataset, duplicate articles were carefully identified and manually removed by comparing titles, authors, and publication information. As a result, 37 duplicate articles were eliminated, leaving 463 unique articles to be evaluated in the next screening phases. Following the removal of duplicate entries, a total of 463 unique articles remained. In this stage, the researcher conducted an initial screening by reviewing the titles and abstracts of all articles to assess their relevance to the research topic, which focused on the relationship between emotional intelligence, academic achievement, and digital learning. During this process, articles that were not aligned with the core variables, context, or research scope were excluded. As a result, 448 articles were eliminated due to irrelevance, and only 15 articles were deemed potentially eligible for full-text screening and further analysis. After the initial screening of titles and abstracts, 15 articles were identified as potentially relevant and were subjected to a full-text review. In this stage, the researcher carefully read and analyzed the entire content of each article to ensure that it met the predefined inclusion criteria. This included checking the clarity of the research objectives, the alignment of variables (emotional intelligence, academic achievement, and digital learning), the methodological rigor, and the contextual relevance to the study. The full-text screening confirmed that all 15 articles met the requirements and were suitable for qualitative synthesis. No additional exclusions were made during this phase, as each article provided sufficient empirical data and relevance to the research questions.

2.3 Eligibility Assessment and Inclusion

To ensure the relevance and quality of the studies included in the final synthesis, the researcher applied predefined inclusion and exclusion criteria during the selection process. The inclusion criteria consisted of: (1) empirical research with clear methodology, (2) studies published between 2014 and 2024, (3) articles discussing the relationship between emotional intelligence, academic achievement, and digital or online learning, (4) peer-reviewed journal publications, and (5) articles written in English or Indonesian. On the other hand, the exclusion criteria included: (1) non-empirical articles such as reviews, conceptual papers, or opinion pieces, (2) studies not focused on the main variables, (3) articles lacking access to full text, and (4) duplicate studies or publications with unclear findings. After applying these criteria, 15 articles were confirmed to meet all inclusion standards and were included in the final review. After going through the seven-step Systematic Literature Review process, the number of articles used in the final analysis was determined. The identification, screening, and selection process was carried out systematically and transparently based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The following PRISMA flowchart summarizes the article selection process, from the initial search to the final selection of 15 articles used in this study.

Fig. 2 illustrates the flow of the article selection process used in this study, following the PRISMA 2020 guidelines. A total of 500 records were identified through initial database searches. After removing 25 duplicate entries and 10 irrelevant articles, 495 unique records remained for further screening. During the title and abstract screening phase, 440 records were excluded due to a lack of relevance. Fifty-five full-text articles were assessed for eligibility, but only 52 could be retrieved. Of these, 37 were excluded based on predefined criteria such as irrelevant variables, non-empirical approaches, or unsuitable contexts. As a result, 15 final articles were included in the review and used as the core material for analysis:

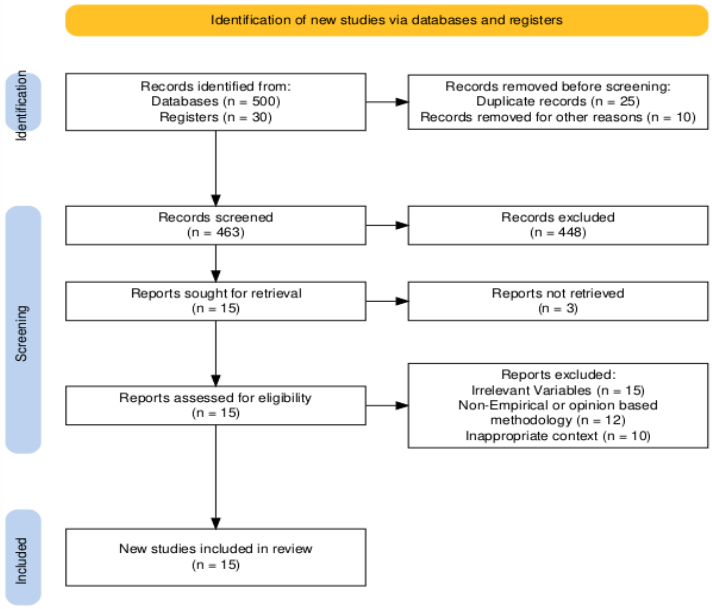

Fig. 2. Study selection flow diagram (a model of PRISMA 2020)

3. Results and Discussion

The systematic review of 500 articles initially identified through database searches ultimately resulted in the selection of 15 empirical studies that met the inclusion criteria. These studies form the basis of the analysis and provide a focused understanding of how emotional intelligence influences academic achievement in digital learning settings. The selected literature spans multiple discipline including education, psychology, and health sciences, and covers diverse regional and institutional contexts. This section synthesizes the main findings from the reviewed studies by organizing them into five key thematic categories: (1) the contributions of emotional intelligence to digital learning, (2) contextual challenges to its implementation, (3) methodological and disciplinary characteristics, and (4) strategic interventions to enhance EI. A summary of the selected studies is presented in Table 3.

Table 3. Reference List for Systematic Literature Review

Title	Author(s) and Year	Digital Learning Context	Scientific Findings	Accreditation
Emotional Intelligence Predicts Academic Performance: A Meta-Analysis [12]	MacCann et al. (2020)	Various digital learning platforms	EI predicts academic performance beyond IQ and personality (ρ≈.20)	Scopus Q1
Emotional Intelligence and Academic Performance in First and Final Year Medical Students [13]	Yusoff et al. (2013)	Blended learning in medical education	EI is positively associated with GPA under stress conditions	Scopus Q2 (BMC Med Educ)
Emotional Intelligence and Academic Performance of Medical Undergraduates [14]	Wijekoon et al. (2017)	Digital and conventional learning	EI and stress significantly affect academic outcomes	Scopus Q2
Emotional Intelligence and Academic Achievement in	Halimi, Al Shammari & Navarro (2021)	Higher education e-learning	EI significantly predicts GPA through engagement	Scopus Q2

Title	Author(s) and Year	Digital Learning Context	Scientific Findings	Accreditation
Higher Education [15]				
Emotional Intelligence Impact on Academic Achievement and Psychological Well-Being [16]	Shengyao et al. (2024)	Fully online learning	EI improves GPA through self-efficacy and motivation	Scopus Q2
The Impact of Emotional Intelligence on Study Habits in Blended Learning [17]	Zhang et al. (2022)	Blended learning in health sciences	EI improves study habits through cognitive engagement	Scopus-indexed
Relationship Between Emotional Intelligence and Learning Motivation During COVID-19 [18]	Tang & He (2023)	Online learning during the COVID-19 pandemic	EI increases learning motivation through self-efficacy and social support	Scopus Q1
Effect of Emotional Intelligence and Academic Social Networking Sites on Academic Performance During COVID-19 [7]	Iqbal et al. (2021)	Digital learning via social networking	EI and ASNS usage positively impact academic performance	PubMed / Scopus Q2
Emotional Intelligence and Self-Regulated Learning Among High School Students [19]	Sukma et al. (2023)	Online mathematics learning	EI contributes 58.5% to students' SRL ability	National Journal
Effect of Emotional Intelligence on Self-Regulated Learning [20]	Dianah & Oktariza (2024)	Junior high school online learning	EI explains 28.6% of SRL variance	SINTA 3
The Influence of Emotional Intelligence and Learning Behavior on Motivation and Learning Outcomes [21]	Rauf et al. (2024)	General e-learning context	EI and learning behavior significantly influence motivation and performance	SINTA 2
The Effects of Intellectual and Emotional Intelligence on Academic Achievement [22]	Yuditasari et al. (2023)	Digital and traditional medical education	EI + IQ explain 81.5% of academic performance variation	SINTA 2
Academic Self-Management and Emotional Intelligence in Distance Learning [23]	Risnawati et al. (2024)	Distance learning at Universitas Terbuka	EI explains 32.1% of academic self-management variance	SINTA 2
The Influence of Emotional Intelligence on Learning Motivation at a Buddhist College [24]	Seneru et al. (2024)	Online learning in higher education	EI significantly influences students' learning motivation	Peer-reviewed National

Title	Author(s) and Year	Digital Learning Context	Scientific Findings	Accreditation
The Effect of Emotional Intelligence and Online Learning on Academic Performance in Batam City [25]	Tanjung et al. (2022)	Online learning during COVID-19	EI and e-learning both positively impact academic achievement	SINTA 2

3.1. Emotional Intelligence Contribution in Digital Learning

Emotional Intelligence (EI) has emerged as a significant psychological resource that supports academic success in digital learning contexts. The 15 reviewed articles consistently point to the essential role of EI in enhancing students' ability to self-manage, engage, and persist in remote education.

- Key Emotional Competencies: Studies identified emotional regulation, self-awareness, and interpersonal understanding as the most influential EI domains in digital learning. MacCann *et al*., [12] demonstrated that students with strong emotion regulation skills maintained better focus and task persistence in asynchronous learning environments. Similarly, Yusoff et al[13] emphasized the predictive power of EI on academic performance across multiple disciplines, especially when digital distractions were high. In local contexts, Dianah & Oktariza[20] found that students with high self-awareness were better equipped to adjust to online workloads and maintain learning motivation despite minimal supervision.
- Academic Outcomes and Psychological Benefits: The reviewed studies consistently associated high EI levels with positive learning outcomes. According to Tang & He[18], Zhang et al [17] reported that students with greater emotional control experienced lower academic anxiety and higher achievement scores in fully online courses. These findings were echoed by Wijekoon et al [14], who observed that emotionally intelligent students were more resilient and adapted more quickly to the demands of hybrid learning platforms. Emotional Intelligence (EI) enables individuals to motivate themselves and others. The presence of EI also changes interpersonal dynamics in online group work and reduces feelings of digital isolation [7].
- Pedagogical Implications: Several studies highlighted the potential of integrating EI-enhancing activities into online instruction. Halimi et al [15] recommended using emotionally reflective writing or peer support forums to help students articulate and process emotional stress. Meanwhile, Rauf et al [21] emphasized the value of training teachers to recognize and respond to students' emotional needs in digital contexts. In Indonesia, Yuditasari et al[22] advocated for blended learning strategies that offer both cognitive structure and emotional scaffolding, which proved effective in maintaining engagement among high school students.

3.2. Contextual Challenges to Emotional Intelligence in Online Learning

Despite the positive influence of emotional intelligence (EI) on academic outcomes, its impact in digital learning environments is often moderated by various contextual barriers. These include differences in technological access, cultural expectations, and the structure of instructional delivery.

- Technological Limitations and Infrastructure Gaps: One recurring theme is the unequal distribution of digital infrastructure, which affects students' ability to fully exercise their emotional competencies. Dianah & Oktariza [20] found that students from low-income backgrounds, who often lacked stable internet access or personal devices, experienced higher stress and reduced emotional self-regulation. Similarly, Rauf *et al* [21] and Shengyao *et al* [16] observed that in regions with weak ICT infrastructure, even emotionally resilient learners struggled with technical disruptions that diminished their motivation and focus. These infrastructural constraints can blunt the practical value of EI in sustaining engagement during online study.

- Cultural and Social Norms Affecting Emotional Expression: Cultural expectations also influence how students regulate and express emotions in learning contexts. In collectivist societies, for example, expressing emotional difficulties may be seen as a weakness. This was highlighted by Fuad Saifuddin & Dwanda Putra [27], Iqbal *et al* [7], who found that students in certain Asian educational cultures were hesitant to disclose emotional struggles in online forums, thereby limiting the social skill and empathy aspects of EI. Yuditasari *et al* [22] further noted that this suppression of emotional communication can weaken group cohesion and reduce student participation in collaborative tasks.
- Instructional Design Constraints: Another limiting factor is the structure of the digital learning experience itself. Rona Tanjung *et al*[25], Yuditasari *et al* [22] argued that fully asynchronous models lacking real-time peer or teacher interaction reduce the opportunities for students to practice emotional self-awareness and relational skills. In contrast, synchronous or blended approaches, such as those described by Zulqaidah *et al* [4], allowed learners to actively manage peer relationships, resolve group conflict, and receive immediate emotional feedback, all of which fostered stronger EI engagement.

3.3. Methodological and Displinary Characteristics of Reviewed Studies

The 15 studies analyzed in this review exhibit diversity in both their methodological approaches and academic disciplines, reflecting the interdisciplinary nature of emotional intelligence (EI) research in digital learning contexts.

- Research Methods Used: The reviewed literature included both quantitative and qualitative approaches, with a predominance of survey-based research. MacCann *et al* [12], for example, employed standardized EI assessment instruments such as the MSCEIT and EQ-i questionnaires combined with academic performance indicators like GPA. These studies used statistical analysis (*e.g*., regression models, ANOVA) to measure the strength of the relationship between EI and academic achievement. On the other hand, Wijekoon *et al* [14] utilized a case study design to explore students' lived experiences in emotionally demanding online learning environments, yielding rich narrative data. This methodological diversity highlights the multidimensional character of EI as both a measurable trait and a lived experience.
- Disciplinary Scope: The studies span a variety of academic fields, including education**,** psychology, and medical sciences. Shengyao et al[16] explored EI in medical education, where emotional self-regulation was linked to clinical simulation performance. In contrast, Mukhlisa *et al* [6], Nur *et al* [9] focused on university students in general education and language learning, investigating how EI influenced self-paced study and virtual group interaction. This disciplinary breadth illustrates the widespread applicability of EI theory, yet also introduces variation in how EI is defined, measured, and applied.
- Geographic and Cultural Coverage: The reviewed studies cover diverse cultural and regional settings from Australia Fadhilah & Mukhlis [5]; MacCann *et al* [12] to Indonesia Dianah & Oktariza [20], Yuditasari *et al* [22], Pakistan Iqbal *et al*. [7] and China Zhang *et al* [17]. This variation allows for broader generalizability but also underscores the need to interpret EI findings within specific sociocultural frameworks. For example, the expression and role of EI in collectivist contexts may differ substantially from that in individualist settings.

3.4. Strategic Interventions to Enhance Emotional Intelligence in Online Learning

To maximize the benefits of emotional intelligence (EI) in digital learning environments, several studies proposed targeted interventions. These strategies focus on strengthening students' emotional competencies through both instructional design and institutional support.

- Embedding EI in Curriculum Design: Some researchers advocated for integrating EI development directly into the curriculum. Dianah and Oktariza [20] introduced structured reflection activities and journaling tasks that encouraged students to express and analyze their emotional experiences during online learning. This method not only improved self-awareness but also increased emotional resilience. Likewise, Sukma *et al* [19] proposed embedding empathy-based case discussions into virtual classes, especially in group assignments, to enhance students' social and emotional engagement.

- Teacher Training and Support System: Several studies emphasized the importance of equipping educators with tools to foster EI among students. Halimi *et al* [15] designed a teacher training module focused on recognizing students' emotional cues in virtual classrooms and providing responsive feedback. Rauf *et al* [21] found that when teachers incorporated EI-sensitive practices, such as emotional check-ins and conflict mediation, student participation and emotional regulation improved significantly. This highlights the role of the instructor as both a content deliverer and emotional facilitator in digital settings.
- Blended and Interactive Learning Models: The use of synchronous and blended learning formats emerged as a consistent recommendation. Yuditasari *et al* [22] found that interactive learning environments such as live discussions, peer feedback sessions, and role-playing activities provided real-time opportunities for students to practice emotional management and relational skills. Shengyao *et al* [16] implemented emotional awareness prompts during video-based simulations in medical education, which resulted in improved clinical empathy and stress handling.

The scientific insights drawn from this review reveal that emotional intelligence (EI) plays a pivotal yet context-dependent role in shaping students' success in digital learning environments. Its significance extends beyond academic performance, functioning as both a cognitive enabler and an emotional buffer that helps students navigate the complexities of remote learning. However, the effectiveness of EI is not universal; it is fundamentally shaped by the sociotechnical and pedagogical landscape in which digital learning takes place. In low-resource contexts, the value of EI often lies in its protective function, helping students maintain emotional regulation and motivation amidst infrastructural limitations, such as unstable internet access or limited peer interaction. In such environments, interventions that embed emotional reflection, teacher empathy, and asynchronous peer feedback have emerged as compensatory tools to sustain engagement. These findings, as seen in studies by Dianah & Oktariza [20], Iqbal *et al* [7], and Rauf *et al* [21], show how EI can counterbalance deficiencies in technological or institutional support. In contrast, in more advanced digital ecosystems, the focus shifts from emotional survival to optimization. Here, EI is leveraged to enhance collaborative learning, student autonomy, and instructional feedback loops, particularly through synchronous models and emotionally intelligent pedagogy. Studies such as Zhang *et al* [17] and Sukma *et al* [19] suggest that emotionally aware learners thrive better in online group tasks, exhibit greater adaptability, and form stronger learning communities, particularly when instructors consciously support emotional development.

Across both contexts, three key conditions consistently determine whether EI can fulfill its potential in online learning, (1) Teacher Emotional Competence Educators must be trained not only in digital tools, but also in emotionally responsive teaching techniques; (2) Contextually Sensitive Instructional Design Curricula must integrate opportunities for students to reflect, collaborate, and receive emotional feedback; (3) Technological Accessibility Without equitable access to platforms and devices, even highly emotionally intelligent students face significant barriers. Ultimately, this review shows that developing EI in digital learning is not an optional enhancement; it is a critical component of inclusive, resilient, and student-centered education. As the digital transformation of learning continues, embedding EI into pedagogical design and policy frameworks will be essential to ensure that technology does not alienate but empowers all learners.

4. Conclusion

This systematic review explicitly addresses the research question by clarifying how emotional intelligence contributes to academic achievement within technology-mediated learning environments. The synthesis of 15 empirical studies shows that emotional intelligence consistently predicts academic performance through cognitive mechanisms that strengthen focus, self-regulated learning, and persistence, as well as through affective mechanisms that support emotional regulation, resilience, and social engagement in online, blended, and asynchronous settings. These findings demonstrate that emotional intelligence is a central element in sustaining student success under the unique conditions of digital learning. The novelty of this review lies in providing an integrated understanding of emotional intelligence within digital learning ecosystems, an area where previous evidence has been fragmented and

methodologically inconsistent. By consolidating diverse findings, this study offers clearer theoretical insights into how emotional and cognitive processes interact during technology-mediated learning. The review also contributes methodologically by identifying variations in conceptual definitions, measurement tools, and analytic approaches that have limited comparability across studies. In practical terms, the review highlights the importance of incorporating emotional competence development into digital instructional design, teacher preparation, and educational policy. It also identifies promising strategies such as reflective learning activities, emotionally responsive pedagogy, and structured peer interaction, which have been shown to enhance student performance and well-being. Future research should further refine these approaches and develop scalable models for integrating emotional intelligence into digital education to create more adaptive, equitable, and emotionally supportive learning environments.

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