EMOTIONAL INTELLIGENCE IN OPEN, DISTANCE, ONLINE AND DIGITAL EDUCATION

Dr. Yavuz TUNA

ORCID: 0000-0003-2181-2393
Faculty of Communication Sciences
Anadolu University
Eskisehir, TURKIYE

Dr. Levent OZKOCAK

ORCID: 0000-0002-0500-5244
Faculty of Communication Sciences
Anadolu University
Eskisehir, TURKIYE

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ABSTRACT

This bibliometric mapping study intended to explore research trends, key contributors, pioneering studies, predominant reach areas and topics as well as possible gaps related to emotional intelligence in the fields of open, distance, online and digital education. A total of 117 publications were included into analysis indexed in WoS and SCOPUS databases. The results have revealed that research in the field of emotional intelligence in ODODE is dynamic and growing. However, to realize its full potential, it needs to grow not only quantitatively, but also in terms of conceptual depth, methodological rigor and practical integration. By responding to the opportunities and challenges highlighted in this report, the field can make an important contribution to more humane, effective and inclusive digital learning environments. This research addresses questions concerning emotional intelligence in open, distance, online, and digital education, including the evolution of research over time, key contributors, seminal studies, dominant research domains and emerging topics, as well as unexplored areas for future investigation.

Keywords: Emotional intelligence, open education, distance education, online education, digital education, bibliometric analysis, PRISMA.

INTRODUCTION

The rapid expansion of open, remote, digital online education (ODODE) has transformed the global educational landscape, opening up unprecedented access to learning opportunities for diverse populations (Bozkurt et al., 2020). However, the unique challenges of ODODE, such as physical isolation, self-directed learning, and limited interaction, have highlighted the importance of non-cognitive skills, particularly emotional intelligence (EI), to student success and well-being (Richardson et al., 2017). Emotional intelligence defined as the ability to recognize, understand, manage and influence emotions in oneself and others (Salovey & Mayer, 1990). It has been shown to be an important factor in managing the complexity of ODODE (Williams, 2020). As research on EI in ODODE continues to grow, there is an urgent need to summarize existing findings to identify trends, gaps and practical implications. This bibliometric mapping aims to address this need by comprehensively analyzing the role of EI in ODODE and its impact on learning objectives, engagement and satisfaction.

Bibliometric mappings play a crucial role in advancing knowledge in a field by providing a rigorous, transparent and reproducible synthesis of existing research (Gough et al., 2017). In contrast to other types of reviews, bibliometric mappings use structured methods to minimize bias and provide a detailed exploration of the literature. In the context of EI and ODODE, bibliometric mapping is particularly valuable for several reasons. First, it provides a clearer understanding of how EI affects online learning by allowing researchers to identify consistent patterns and inconsistencies between studies (Zembylas, 2008). Second, it points to future research directions by identifying gaps in the literature (Kahu & Nelson, 2017). Finally, it provides evidence-based insights for educators, policy makers and teachers who want to improve the quality and effectiveness of ODODE (Means et al., 2013).

Salovey and Mayer (1990) are the first researchers introduced the concept of emotional intelligence; later Goleman (1995) expanded it which has evolved considerably over the last three decades. Originally conceptualized as a set of abilities to perceive and regulate emotions, emotional intelligence has since been expanded to include traits such as empathy, motivation and social skills (Mayer et al., 2008). In education, emotional intelligence is recognized as a key factor in academic achievement, interpersonal relationships and general well-being (MacCann et al., 2020). Research has shown that emotionally intelligent students are better able to cope with stress, collaborate with peers, and persevere in the face of challenges; these skills are particularly important in ESL contexts where students often face additional obstacles such as lack of time, technical issues, and limited social support (Artino & Jones, 2012).

The application of emotional intelligence in education goes beyond individual student outcomes to include the role of teachers and the design of learning environments. Educators with emotional intelligence are more effective at creating supportive and inclusive online spaces, building meaningful connections with students, and addressing the emotional dimensions of learning (Brackett et al., 2012). Furthermore, integrating EI principles into curriculum design and pedagogical practices has been shown to increase learner engagement, motivation and retention in ESL environments (Fredricks et al., 2016).

Despite the growing body of research on EI in education, there is still a lack of bibliometric summaries on its role in ODODE. This review intends to fill this gap by examining the development of EI concepts and their application in ESL, exploring the interaction between EI and key outcomes such as academic achievement, engagement and well-being, and identifying strategies for using EI to enhance online learning experiences. In this way, this review aims to contribute to a deeper understanding of the affective dimensions of ODODE and provide actionable insights for stakeholders in the field.

The rapid development of educational technologies has led to the emergence of various learning methods, including open education, distance learning, online education and digital education. Although these terms are often used interchangeably, they represent different approaches to teaching and learning, each with their own characteristics, objectives and methods.

Open education is based on the philosophy of removing barriers to learning such as cost, location and time. Although it is most delivered through distance learning, there are also applications of open education that take place face-to-face. *Distance education,* as the name suggests, refers to any form of learning where learners and teachers are separated in time and/or space. Historically, it was based on postal courses but has evolved to include digital technologies such as video conferencing, email and learning management systems (LMS). Distance learning is often institutionally driven and structured, focusing on access to students who are unable to attend traditional face-to-face classes (Moore & Kearsley, 2012). The COVID-19 pandemic has accelerated the adoption of ODODE and highlighted its potential for resilience in times of crisis (Hodges et al., 2020). Online education is a subset of distance education and specifically utilizes the internet as the primary medium for delivering content and facilitating interaction. It includes synchronous and asynchronous learning experiences, often supported by LMS platforms such as Moodle, Canvas or Blackboard. *Online education* is characterized by its flexibility and scalability, making it a popular choice for both formal and non-formal learning contexts (Allen & Seaman, 2017). Research has shown that well-designed ODODE courses can achieve learning outcomes comparable to traditional face-to-face education (Means et al., 2013). *Digital education* is a broad term that covers the use of digital tools and technologies to support teaching and learning. It encompasses not only online and distance learning, but also blended learning, hybrid classrooms and the integration of digital resources into traditional classrooms. Digital education emphasizes the transformative potential of technology to improve pedagogical practices and student engagement (Selwyn, 2016).

Open education, distance education, online education and digital education are different but interrelated approaches to modern learning. While they share the common goal of expanding access and utilizing technology, their unique characteristics and methods meet different learner needs. As research and practice evolve, these methods will likely continue to converge with technological advances and the increasing importance of lifelong learning. Understanding their similarities and differences is crucial for educators, policy makers and researchers if they are to realize their full potential in shaping the future of education.

EMOTIONAL INTELLIGENCE IN EDUCATION

Emotional intelligence (EI) has been shown to be a critical factor influencing student achievement, teacher effectiveness, and the overall learning environment in educational contexts. This review summarizes the key research findings on emotional intelligence in education and focuses on the interaction between emotional intelligence and academic achievement, student engagement, teacher-student interaction as well as the design of an emotionally supportive learning environment.

Numerous research studies have shown a positive relationship between emotional intelligence and academic achievement. MacCann et al. (2020) meta-analyzed 158 studies and found that emotional intelligence consistently predicts academic performance at different levels of education. The study emphasized that students with higher emotional intelligence are better able to cope with stress, be motivated and adapt to challenges, all of which contribute to better academic outcomes. Similarly, Parker et al. (2006) found that high school students with higher EI scores received better grades and were more likely to successfully transfer to university. These findings revealed that emotional intelligence plays a significant role in academic achievement by promoting self-regulation and resilience.

Student engagement, an important determinant of learning outcomes, is also closely related to emotional intelligence. Fredricks et al. (2016), in reviewing studies on emotional intelligence and engagement, found that emotionally intelligent students are more likely to actively participate in class, collaborate with peers and struggle with challenges. In online learning environments, where students often face isolation and seclusion, emotional intelligence has been shown to reduce these challenges. Artino and Jones (2012) found that students with high emotional intelligence are more likely to participate in online courses because they are better able to manage their emotions and maintain motivation in self-directed learning contexts.

The emotional intelligence of teachers is equally important for creating positive learning experiences. Brackett et al. (2012) have shown that teachers with high emotional intelligence create supportive and inclusive lessons that lead to better learning outcomes. These teachers are able to recognize and respond to students' emotional needs and provide a sense of belonging and safety. In a study by Jennings and Greenberg (2009), teachers with emotional intelligence were found to have stronger relationships with their students, leading to fewer behavioral problems and better academic performance. This emphasizes the importance of emotional intelligence in building effective teacher-student interactions.

The integration of emotional intelligence into social-emotional learning (SEL) programs has been studied extensively and with promising results. According to a meta-analysis of 213 SEL programs (Durlak et al., 2011) students who participated in these programs showed significant improvements in emotional intelligence, academic achievement and social skills. SEL programs typically include activities to develop self-awareness, empathy and emotion regulation, which are the core components of emotional intelligence. The RULER program developed by Brackett and Rivers (2014), for example, has been shown to improve the emotional climate in schools and increase the well-being of students and teachers.

Research has also examined the impact of cultural and contextual factors on the role of EI in education. Kim and Lee (2021) found that students from collectivist cultures, where emotional interdependence is valued, exhibited higher levels of EI and reported greater satisfaction in collaborative learning environments. In contrast, students from individualistic cultures tended to prioritize their self-confidence, which affected the impact of EI on their learning experience. These findings emphasize the need for a culturally sensitive approach to EI in education.

Despite the growing body of research, some challenges remain. First, there is a lack of standardized instruments to measure EI, particularly in the educational context (Mayer et al., 2008). Second, most studies are cross-sectional, which limits our understanding of the long-term effects of EI on educational outcomes (MacCann et al., 2020). Future research should focus on longitudinal studies and the development of context-specific EI assessments. In addition, more attention should be paid to the role of intelligence in diverse populations, including non-traditional students and students with disabilities. The role of intelligence in online and distance learning has received particular attention during the COVID-19 pandemic.

Emotional Intelligence in Open, Distance, Online and Digital Education

The rapid growth of open, distance, online and digital education (ODODE) has transformed the educational landscape by offering flexibility and accessibility to students worldwide. However, the unique challenges of these environments, such as physical isolation, self-directed learning and limited face-to-face interaction, have highlighted the importance of emotional intelligence (EI) in promoting student success and well-being. This review summarizes key research findings on the role of emotional intelligence in ESL and focuses on its impact on academic performance, engagement, stress management and the design of emotionally supportive learning environments.

Emotional intelligence has been consistently associated with academic success in online and distance learning contexts. Parker et al. (2021) conducted a longitudinal study of university students enrolled in online degree programs and found that those with higher EI scores achieved better grades and were more likely to persevere despite difficulties. The study attributed this success to students' ability to cope with stress, stay motivated and adapt to the self-paced nature of online learning. Similarly, Artino and Jones (2012) examined the relationship between emotional intelligence and self-directed learning in online courses and found that students with emotional intelligence were better able to set goals, monitor their progress and seek help when needed. These results emphasize the importance of emotional intelligence in meeting the requirements of self-directed online learning environments.

Engagement is a critical factor in the success of online learners, and EI plays an important role in promoting active engagement. Richardson et al. (2017) conducted a meta-analysis of studies on student engagement in online learning and found that students with EI were more likely to participate in discussions, collaborate with peers and complete assignments on time. The study emphasized the role of EI in creating an emotional presence in virtual classrooms, which helps to reduce feelings of isolation. In addition, Zembylas (2008) emphasized the importance of EI in building meaningful relationships in online environments, noting that students with EI are better able to express empathy and build relationships with peers and faculty.

The self-directed nature of ODODE can be stressful, especially for students who need to balance their education with work or family commitments. Research has shown that EI is an important factor in coping with stress and maintaining psychological well-being in online learning environments. Fernandez-Martinez et al. (2019) surveyed online learners and found that those with higher EI reported lower levels of stress and anxiety. The study identified emotion regulation and self-awareness as crucial skills for coping with the challenges of online education. Similarly, Parker et al (2021) found that students with EI were more resilient in the face of technical difficulties and other setbacks, enabling them to stay focused and motivated.

The emotional intelligence of teachers and curriculum leaders also plays an important role in creating positive online learning experiences. Brackett et al. (2012) showed that teachers with emotional intelligence are better able to create supportive and inclusive virtual classrooms. These teachers can recognize and respond to students' emotional needs and provide a sense of belonging and safety. Studies by Rodriguez-Ardura and Meseguer-Artola (2016) and Zhang (2022) have shown that integrating EI principles into the design of online courses, such as providing empathic feedback and encouraging peer support, increases student satisfaction and engagement. These findings emphasize the importance of incorporating EI into the design and delivery of online courses.

The integration of emotional intelligence into social-emotional learning programs has been extensively studied and has shown promising results for online and digital education. Durlak et al (2011) conducted a meta-analysis of emotional learning program and found that students who participated in these programs showed significant improvements in emotional intelligence, academic performance and social skills. Within ODODE, social-emotional learning programs that focus on self-awareness, empathy and emotion regulation have been shown to improve student outcomes. For example, the RULER program developed by Brackett and Rivers (2014) was adapted to online environments and was effective in improving emotional climate and well-being in virtual classrooms.

Research has also investigated the influence of cultural and contextual factors on the role of EI in CLODE. Kim and Lee (2021) found that students from collectivist cultures, where emotional interdependence is valued, exhibited higher levels of EI and reported greater satisfaction in collaborative online learning environments. In contrast, students from individualistic cultures tended to prioritize their self-confidence, which affected the impact of EI on their learning experience. These findings emphasize the need for a culturally sensitive approach to EI in online teaching.

Despite the growing body of research, some challenges remain. First, there is a lack of standardized instruments to measure EI, particularly in online and digital contexts (Mayer et al., 2008). Second, most studies are cross-sectional, which limits our understanding of the long-term effects of EI on educational outcomes (MacCann et al., 2020). Future research should focus on longitudinal studies and the development of context-specific EI assessments. In addition, more attention should be paid to the role of intelligence in diverse populations, including non-traditional students and students with disabilities.

To summarize, emotional intelligence is an important component for success in open, distance, online and digital education. Research has consistently demonstrated the benefits of emotional intelligence on academic performance, engagement, stress management and the design of supportive learning environments. Educators can create more inclusive and effective learning experiences by integrating EI into online education practices. However, further research is needed to identify the current gaps in EI research and practice in open, remote, online digital education.

PURPOSE OF THE STUDY

This study intended to explore research trends and possible gaps related to emotional intelligence in the fields of open, distance, online and digital education. More specifically, the answers to the following questions related to emotional intelligence in open, distance, online and digital education were sought:

1. How has the body of research on emotional intelligence in ODODE evolved over time?
2. Which researchers, institutions, or countries have been the most influential in this field?
3. Which studies are considered foundational or landmark contributions to the literature?
4. What are the dominant thematic areas and emerging topics in the current research landscape?
5. What gaps remain in the literature, and what directions should future research explore?

METHOD

In this study, bibliometric mapping was used as a descriptive cross-sectional research method. Bibliometric mapping is a quantitative research method for assessing the structure, trends and impact of scientific publications in a particular field. As a descriptive cross-sectional study, it provides a snapshot of existing research at a specific point in time by analyzing aspects such as publication trends, citation networks, author collaborations and thematic developments. By using bibliometric indicators (e.g. number of publications, citation impact, coincidence of keywords), this method helps researchers to identify influential studies, emerging topics and gaps in the literature, making it a valuable tool for mapping knowledge structures in different disciplines (Zupic & Cater, 2015).

The bibliometric mapping process usually begins with data collection. Researchers collect data from academic databases such as Scopus, Web of Science, etc., focusing on specific topics, time periods or areas. Once the data is collected, specialized software such as VOSviewer, CiteSpace or R-based tools such as Bibliometrix are used to analyze the data. These tools help to identify trends such as the most frequently cited articles, influential authors or emerging topics. Visualization techniques such as network maps, heat maps or diagrams are often used to show relationships and trends and make the results more accessible and interpretable. Finally, researchers interpret the results and draw conclusions about the state of the field, research gaps and future directions (Aria & Cuccurullo, 2017).

The research was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, which emphasize transparency and reproducibility in bibliometric reporting. Figure 1 illustrates the application of the PRISMA guidelines.

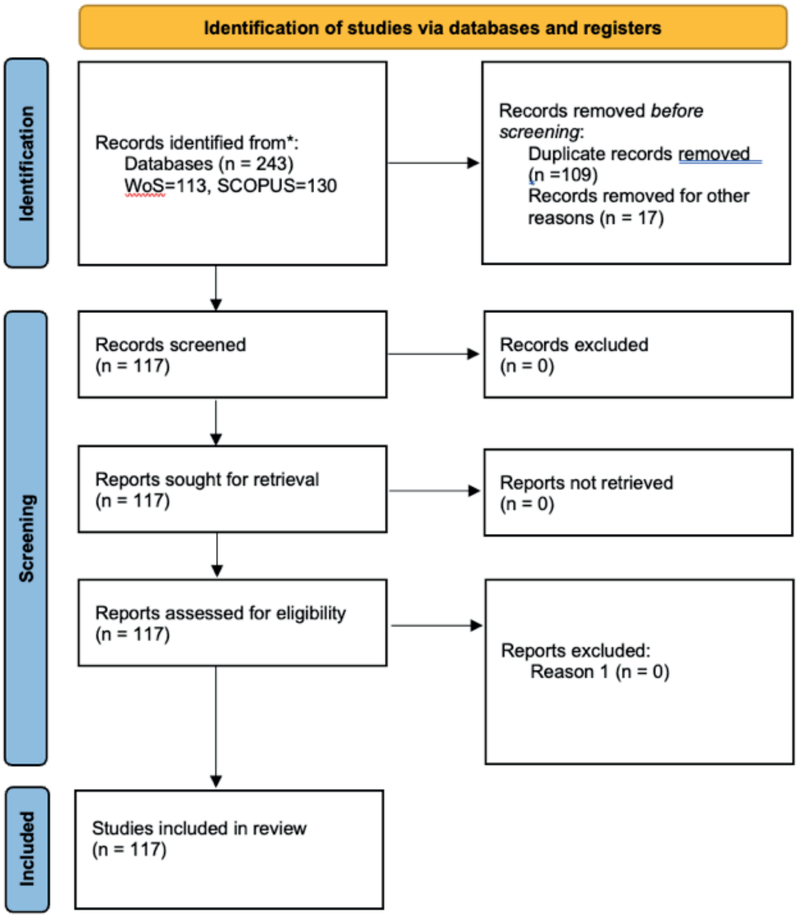


Figure 1. PRISMA flow chart for the inclusion of articles

A comprehensive search of the Web of Science and Scopus databases was conducted in January 2025, focusing on articles published in the last three decades. The following main keyword phrases were included in the Boolean search: “emotional intelligence” AND “online learning”, “online education”, “distance learning”, “distance education”, “open education”, “open learning”, “open and distance learning”, “digital education” and “distance learning”.

The initial search yielded 113 publications in WoS and 130 in Scopus, which were screened for overlap and relevance, resulting in a final dataset of 117 publications suitable for analysis. Due to the small number of publications, the criteria for identifying academic publications were limited to (1) publication and (2) availability in full-text format. These 117 articles from 95 sources were analyzed using the programs bibliometrix and biblioshiny. Aria and Cuccurullo (2017) describe bibliometrix as “an open-source tool for conducting a comprehensive science mapping analysis of the scientific literature. It is programmed in the R language to be flexible and to facilitate integration with other statistical and graphical packages (p. 973)”.

During the data collection and analysis no AI tools has been used. The data was drawn from WoS and Scopus by using these databases on tools (not AI based) and later data from both databases compared by the researchers. Also, the analysis was done via biblioshiny and the results were also examined by the researchers.

The procedures employed in this bibliometric mapping study demonstrate a high degree of reliability and validity through the use of systematic and transparent methods. Reliability was supported by the consistent application of bibliometric techniques using well-established tools such as Bibliometrix and Biblioshiny, which allow for reproducible analysis of publication trends, citation impact, and co-authorship networks. To ensure validity, the study adhered to the PRISMA guidelines, enhancing transparency in the selection and screening of articles. Data were collected from two reputable databases—Web of Science and Scopus—using comprehensive and relevant keyword combinations to maximize coverage. Furthermore, the inclusion criteria focused on peer-reviewed publications available in full text, ensuring the relevance and academic quality of the data set. The combination of methodological rigor, transparent reporting, and the use of validated analytical tools contributes to the overall robustness and trustworthiness of the study's findings.

FINDINGS

The report on the results is divided into five sections in which the research questions are addressed.

Research Growth

The development of emotional intelligence research in ODODE shows a clear temporal trend. The earliest identified publication dates to 1997 (Boverie et al. 1997), indicating the first conceptual interaction with emotional intelligence in ODODE settings. However, this area remained relatively stagnant until the late 2000s. A notable increase in scientific publications began around 2010, indicating a growing scientific interest with the proliferation of e-learning platforms and virtual learning environments.

The data in the "Annual scientific publications" table (Figure 2) shows a significant increase in articles after 2020, a trend that is consistent with the global response to the COVID-19 pandemic, which has caused a massive shift to online education. The increased use of digital platforms has drawn attention to the affective dimensions of learning, including the importance of students' emotional and social wellbeing in distance learning environments. The peak of publications during this period reflects the response of the academic community to this shift.

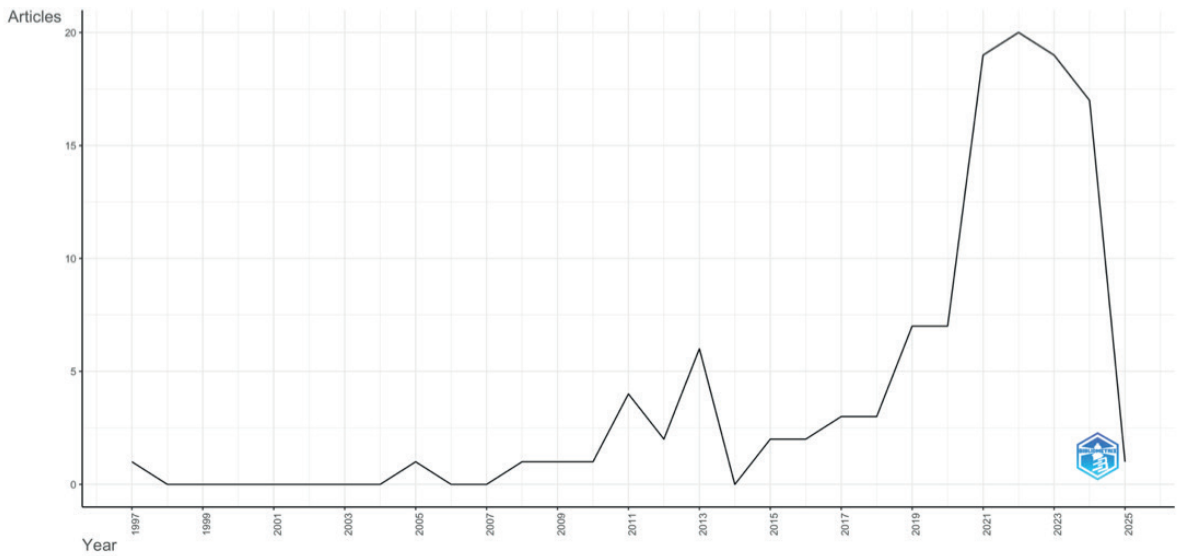


Figure 2. Annual scientific publications

In addition to the increase in publication volume, Figure 3 (Annual Citation Count) shows that articles published in the last five years have received an increasing number of citations. This shows that new studies are not only more numerous, but also more influential. For example, papers published in 2021 have a higher average citation rate compared to earlier studies, emphasizing their validity and resonance in the academic community.

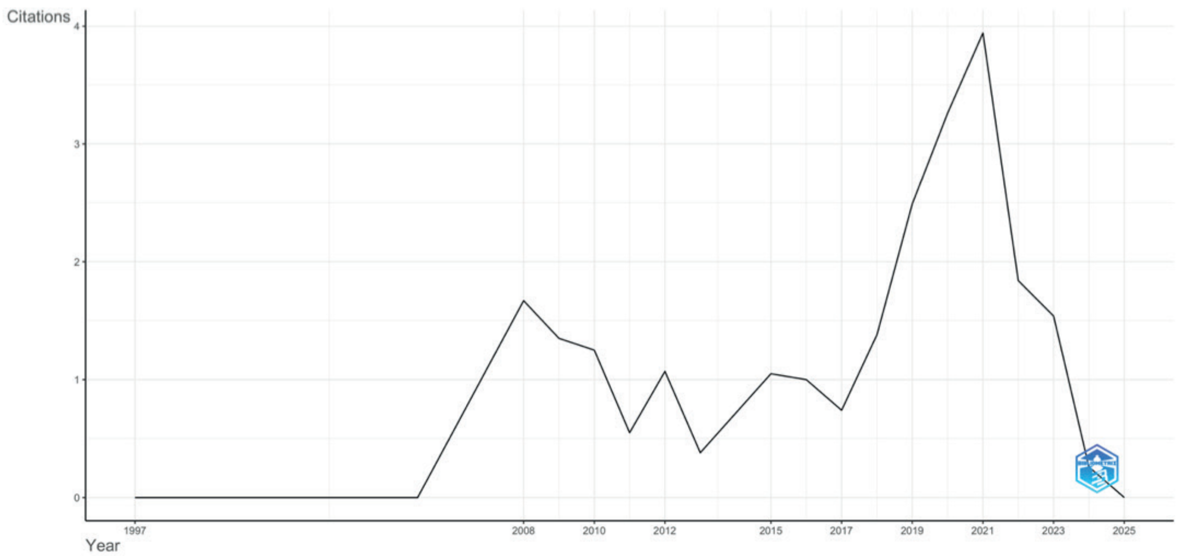


Figure 3. Number of citations per year

As a result, the growth of research is accelerating, with significant fluctuations linked to technological advances, global changes in education and a growing awareness of the psychological dimensions of learning. This upward trend indicates a mature field ready for further development.

Key Players

An interesting situation arises regarding authorship. It should be noted that there are no researchers with more than two publications. These authors include Ferreira et al. (2013), Hensley et al. (2020), Kumar et al. (2019), Emirtekin et al. (2019). The work of these authors has received attention through citation and co-authorship networks. However, the level of fractional authorship indicates that their contributions are often part of collaborative projects, a sign of the increasing interdisciplinary work in this field.

The contributions of the institutions are also remarkable, as can be seen in Figure 4. University Sains Malaysia, Ural State Pedagogical University and Lebanese American University emerge as leading research centers. These institutions have produced several studies and have shown a consistent interest in the topic. Their geographical diversity, spanning Asia, Eastern Europe and the Middle East, indicates a global interest in emotional intelligence in online learning.

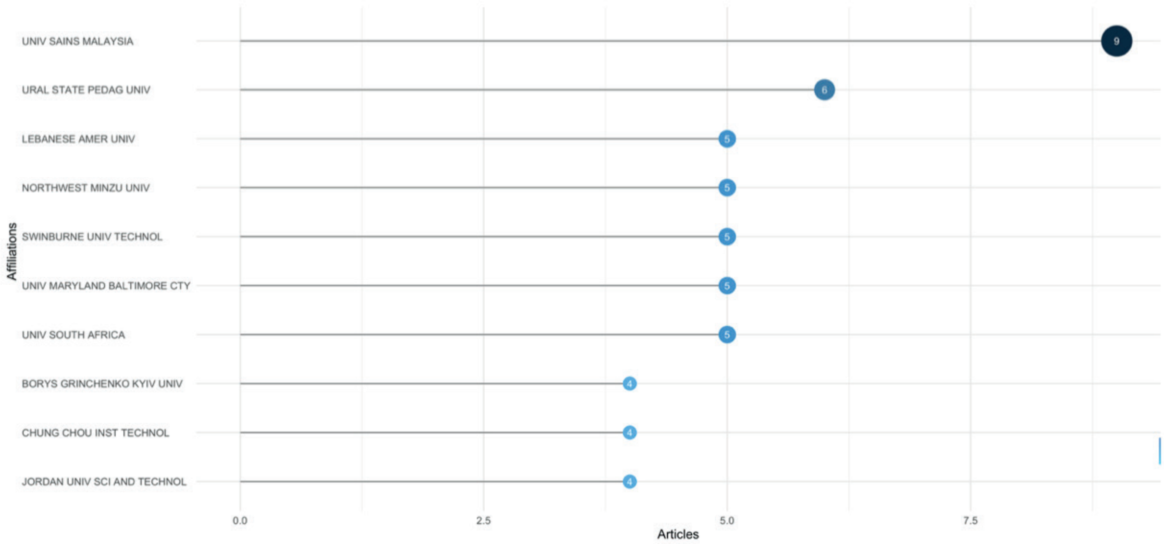


Figure 4. The most frequently contributed institutions

At a national level (Figure 5), it is interesting to note that the United States, China and the United Kingdom dominate in terms of both the number of publications and citations. The USA, especially on, is not only the leader in terms of quantity, but also has a high average citation frequency, which is indicative of both productivity and quality. While India does not lead in the number of publications, it has an impressive ratio of citations to publications, which emphasizes the global importance of its scientific contributions.

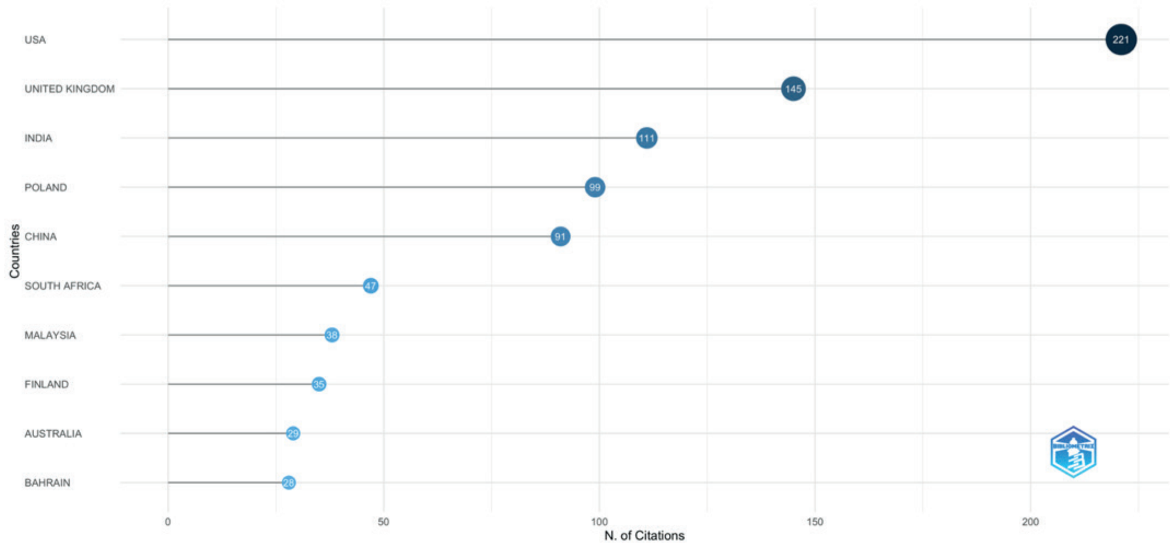


Figure 5. List of countries with the most contributions

Figure 6 shows the academic journals and conference proceedings that contribute the most publications to the ODODE' EI bibliometric dataset. The journal "Frontiers in Psychology" stands out with 4 publications and is the most productive source. This indicates that the journal is an important source for empirical and theoretical research on emotional and psychological dimensions in digital learning contexts. Journals such as "Amazonia Investiga", "Behavioral Sciences" and "Obrazovanie i Nauka-Education and Science" contributed 3 papers each, showing a moderate but focused interest in the interface of EI and educational technologies. The presence of conference proceedings (e.g. 6th International Conference on Education, Research...) and journals on adult education and education and development emphasizes the interdisciplinary nature of the field, which integrates perspectives from psychology, pedagogy, technology and lifelong learning. This distribution implies a scattered but growing body of literature with contributions from journals in the fields of psychology, education and professional development. This distribution also reflects a global academic engagement, with contributions from both high-ranking international journals and regional or thematic publications.

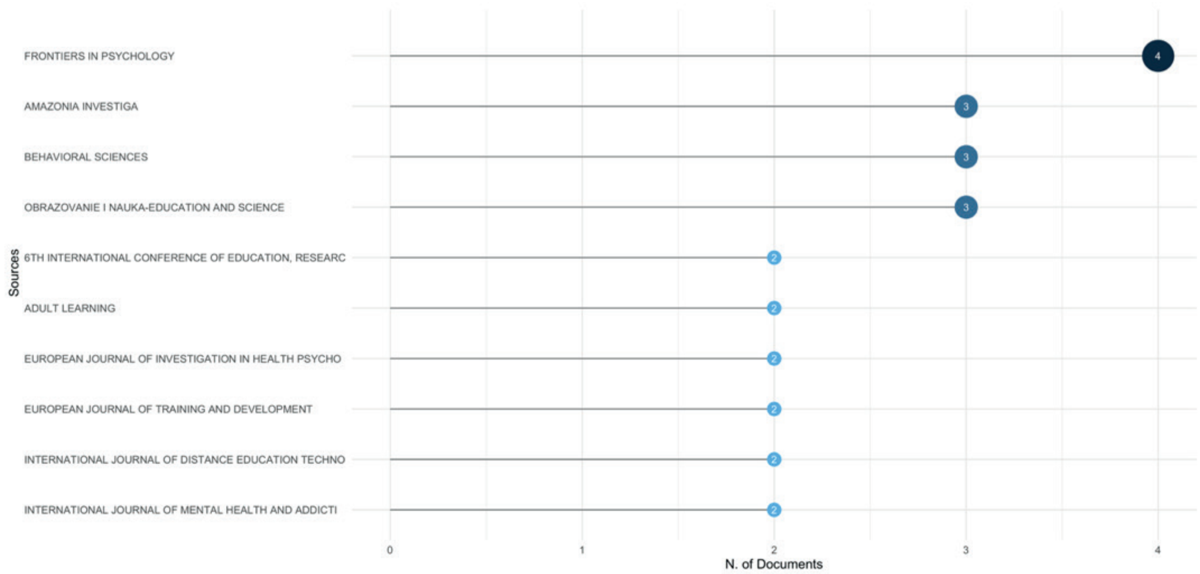


Figure 6. Sources that contribute the most publications

Figure 7 shows the most frequently cited sources in the dataset of 117 studies - an indication of foundational or highly influential studies in a particular area of EI in ODODE. Personality and Individual Differences (PERS INDIV DIFFER) tops the list with 101 local citations, emphasizing its importance in the literature on emotions and personality traits, which are central constructs of EI research. Frontiers in Psychology is again in first place with 72 citations, emphasizing its dual role as an important author and highly cited source, further confirming its influence in this area of research. Other frequently cited sources include Computers in Human Behavior, Nurse Education Today and Computer Education, suggesting a strong overlap between emotional intelligence, educational technology and applied psychology. The presence of Psychological Bulletin and Journal of Personality and Social Psychology, both high impact journals in psychology, suggests that the work in digital education is grounded in theoretical and empirical foundations from the core psychological sciences. The inclusion of Internet and Higher Education (27 citations) is consistent with the study's focus on online and digital learning environments and emphasizes the importance of this journal in shaping debates about student engagement, presence and emotional support in virtual contexts. This pattern shows that while the field is interdisciplinary, it is grounded in sound psychological theory, with extensions into the areas of technology-enhanced education and health-related education.

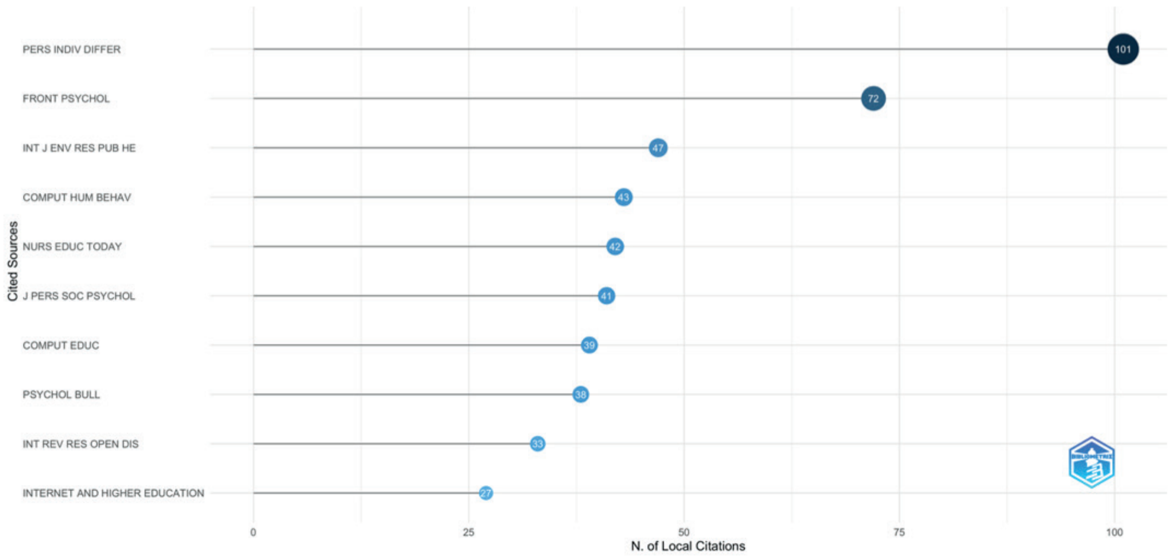


Figure 7. Most cited sources

Milestone Studies

Landmark studies were identified based on the total number of citations, normalized citation values and their inclusion in co-citation networks. As can be seen in Figure 8, the three most frequently cited documents are worldwide:

1. Chandra, Y. (2021), Asian Education and Development Studies - 100 citations.
2. Jakubowski T.D & Sitko-Dominik M.M. (2021), PLOS ONE - 80 citations.
3. Yuan, Y. (2021), Personality and individual differences - 51 citations.

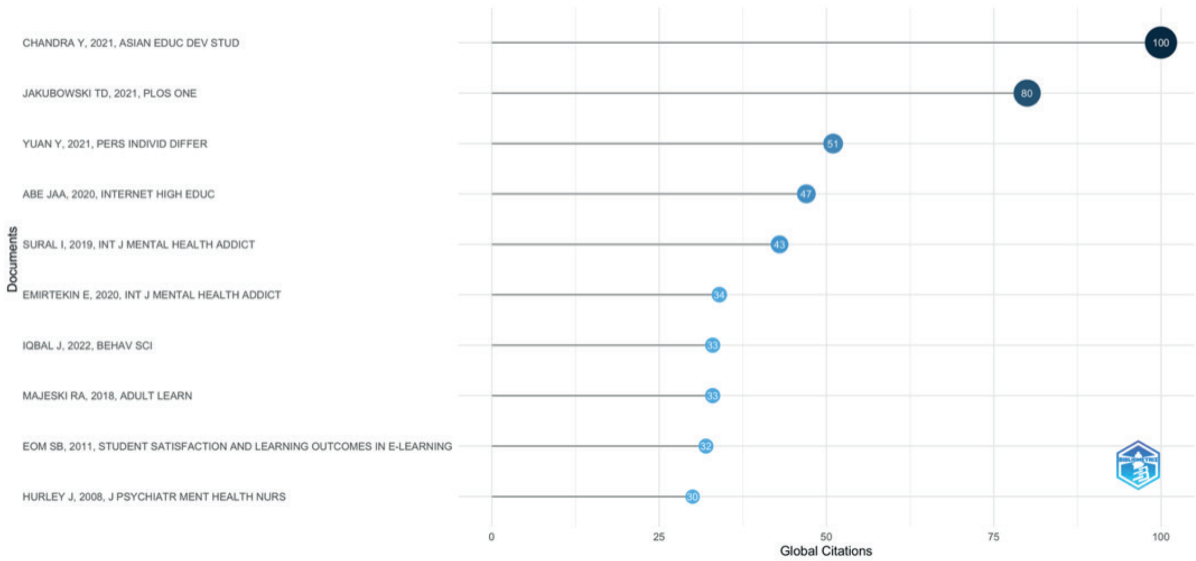


Figure 8. Most frequently cited publications worldwide

These studies address critical topics such as emotion regulation in digital learning environments, psychological adjustment in online transitions, and the interaction between emotional intelligence and student engagement. Their high citation frequency reflects their widespread use in current academic discourse. In addition, the seminal works of Salovey & Mayer (1990), Mayer et al. (1997) and Goleman (1995) remain the most frequently cited references. These classic texts form the theoretical backbone of the field, although new empirical studies are expanding their application in the context of digital learning. In citation networks, scholars such as Petrides (Petrides, Furnham, & Mavroveli, 2007) frequently appear and emphasize their influence on measurement models and scales for emotional intelligence. Their methods and theoretical frameworks continue to shape the way researchers assess emotional intelligence in education. These important studies represent both theoretical and applied perspectives, combining foundational knowledge with modern applications of the digital age.

Predominant Research Areas and Emerging Topics

The frequency of keywords, the analysis of trending topics and common word networks provide a comprehensive picture of prevailing and emerging topics.

Figure 9. Most frequently used words

The most frequently used keywords include "emotional intelligence", "education", "achievement", "students" and "personality". It is clear from these terms that the literature primarily focuses on the characteristics and outcomes of students in the context of online education.

Figure 10 contains a trend analysis that shows that from 2020, topics such as 'affect', 'self-regulation' and 'student performance' are coming to the fore. This reflects a shift towards examining how emotional intelligence impacts measurable learning outcomes and how students manage their emotions and behaviors in virtual environments. The joint word network analysis reveals strong clusters around terms such as 'language', 'teacher' and 'EFL student'. This suggests that a significant amount of the literature is in language education, possibly due to the emotionally challenging nature of language learning and communication in online environments. The factorial and thematic analyses reinforce these trends. The clusters focus on self-regulation, digital literacy, teacher presence and academic motivation. Taken together, these themes suggest that cognitive, affective and technological considerations intersect in digital education endeavors.

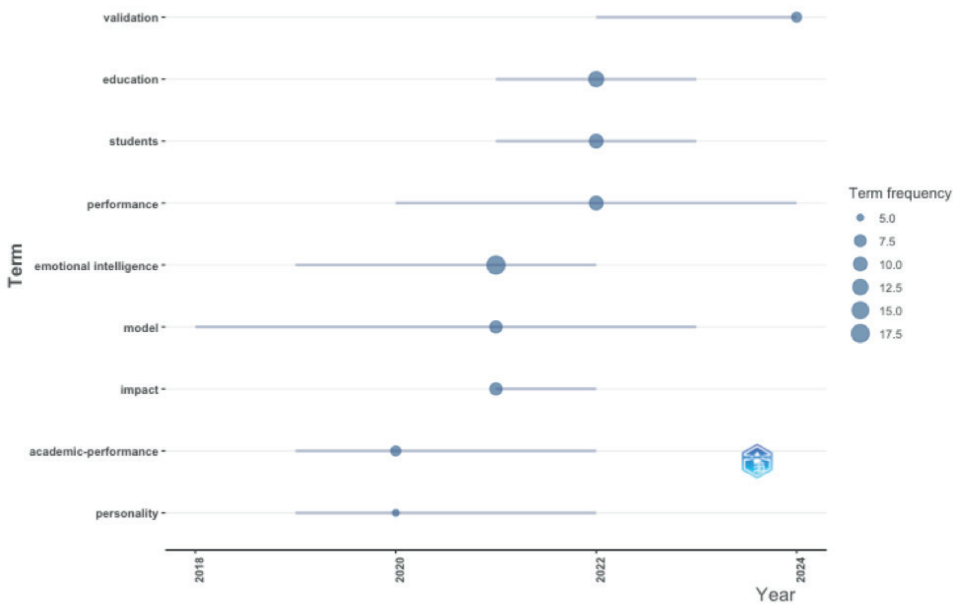


Figure 10. Trends in the most frequently used keywords

Predominant areas include student achievement, affective engagement, teacher-student interaction and language learning. Emerging areas reflect a growing interest in empirical results and context-specific applications.

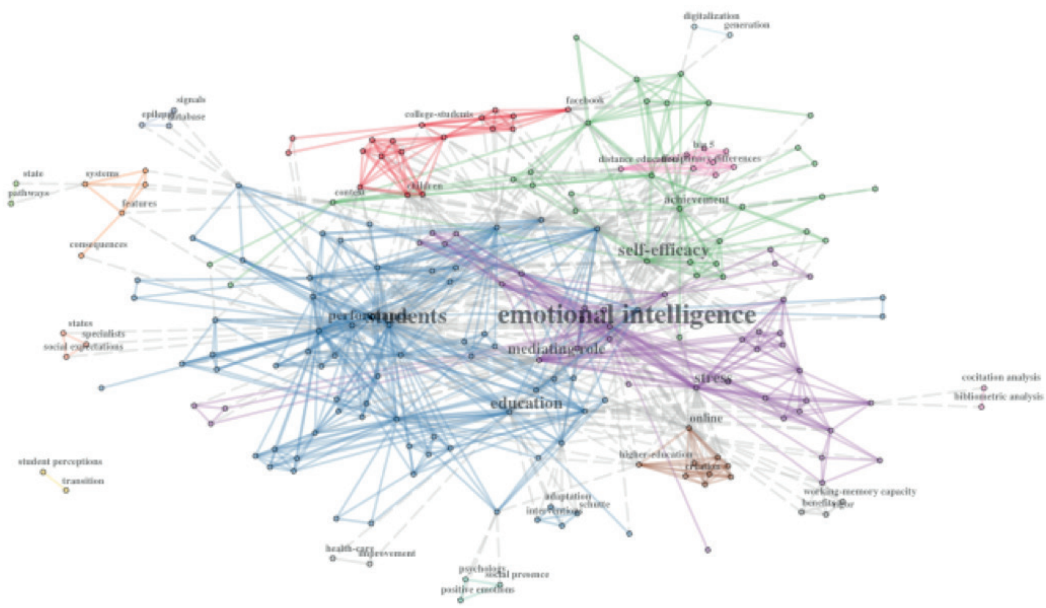


Figure 11. Network analysis of the keyword

Unexplored Areas for Future Research

Although the field has grown rapidly, several areas have not yet been sufficiently researched. Firstly, the emotional intelligence of teachers in online environments has been relatively neglected. Most studies focus on students and neglect the emotional labor and regulation strategies that teachers need in digital environments. Secondly, technological integrations such as the use of artificial intelligence and emotion recognition software are on the rise but are still barely addressed in the literature. These technologies have the potential to change the way emotional states are monitored and managed in online learning. Third, the role of emotional intelligence in inclusive education and in supporting diverse learners, including those with disabilities or socio-emotional issues, is another gap. Few studies directly address how emotional intelligence can be used to promote equity and accessibility in online education. Fourth, regional differences are evident. While Asia and North America are well represented, contributions from Africa, Latin America and smaller European countries are limited. Expanding research in these areas could lead to more culturally diverse perspectives. Finally, longitudinal and experimental studies that go beyond correlative results are needed. Understanding the causal effects of emotional intelligence interventions on academic outcomes over time would significantly advance the field.

DISCUSSIONS AND CONCLUSION

Through five targeted research questions, this bibliometric mapping provides an in-depth understanding of the research landscape on emotional intelligence (EI) in open, digital, online and distance education (ODODE). There has been a steady increase in both academic output and citation impact in this area, particularly since 2020. This growth is linked to the global shift to distance learning, which emphasizes the importance of emotional competencies for student engagement and wellbeing.

The results of this study reveal a complex but promising research ecosystem driven by different participants, important theoretical frameworks and emerging themes related to digital transformation. However, the study also highlights some under-researched areas that require academic attention. The key research areas are as follows:

Other types of review: This bibliometric mapping is used to track research trends, networks and thematic developments over time. However, there are other types of reviews that can be conducted to develop a better understanding of EI in ODODE. For example, a scoping review can map the breadth of EI-related interventions in ODODE contexts, while a systematic review can rigorously assess their effectiveness. An integrative review is ideal for synthesizing mixed methods findings, and a critical review can challenge underlying theoretical assumptions. This multi-method approach will deepen theoretical understanding, guide evidence-based practice, and identify gaps for targeted research in the emerging field of emotionally intelligent digital learning.

Expanding theoretical coverage in digital contexts: While the classic emotional intelligence models of Goleman (1995) and Mayer and Salovey (1997) remain the foundation of the field, there is a pressing need to extend these frameworks to better fit digital educational environments. Studies such as Petrides et al. (2007) on emotional intelligence and Bar-On's (2006) model of emotional-social intelligence offer alternative conceptualizations that can be integrated into digital pedagogy research. Researchers should investigate how these models work in online-only, asynchronous and hybrid contexts, where the cues for recognizing and expressing emotions differ significantly from those in face-to-face contexts.

Investigating teachers' EI in virtual spaces: While relatively little research has been done on the EI of teachers who design the learning environment, disproportionate attention has been paid to the EI of students. Teacher EI has been associated with better classroom management, student motivation, and instructional quality (Jennings & Greenberg, 2009), but its role in online environments remains unclear. Future studies should examine how teacher EI influences student engagement, especially in environments where there is no face-to-face interaction.

Using artificial intelligence and emotion analysis ethically: Technologies for recognizing emotions by analyzing facial expressions, recognizing emotions or biometric feedback are gradually finding their way into online education (e.g. emotion informatics). However, their introduction raises concerns about privacy, bias and consent. Research should not only evaluate the effectiveness of these tools to improve EI-based feedback, but also critically examine the ethical implications (Calvo & D'Mello, 2010).

Promoting diversity in geographical and cultural contexts: Much of the literature has focused on high-income Anglophone countries. Extending the studies to low- and middle-income regions may contribute important socio-cultural nuances on how EI emerges and is promoted in digital spaces. For example, Hofstede's cultural dimensions could serve as a framework to examine how collectivist and individualist societies influence EI in online learning.

Application of advanced methodological approaches: Many studies are cross-sectional and correlational. To advance the field, longitudinal studies can track emotional development throughout a course or program. Experimental and design-based research can help assess the causal impact of EI training or emotionally supportive learning environments on students' academic performance, retention and satisfaction.

The findings of this bibliometric mapping study align with and extend the existing literature on emotional intelligence in ODODE. The observed growth in scholarly output since 2010, and especially the surge after 2020, corresponds with earlier reports that noted a renewed interest in the affective dimensions of online learning during and following the COVID-19 pandemic (Chandra, 2021; Hodges et al., 2020). These studies similarly emphasized the psychological strain brought by emergency remote teaching and the subsequent recognition of EI as a critical component for learner resilience and well-being.

The predominance of research focusing on students, rather than instructors, mirrors earlier findings by Parker et al. (2021) and Fernandez-Martinez et al. (2019), who highlighted the role of student emotional intelligence in academic success, motivation, and stress management in digital learning contexts. Like these studies, the current analysis confirms that EI is a strong predictor of student engagement and performance in ODODE environments. However, the present study also confirms the ongoing underrepresentation of research into teacher EI in virtual settings, a gap previously noted by Brackett et al. (2012) and Jennings and Greenberg (2009), who stressed the importance of emotionally competent educators for creating supportive digital learning climates.

The mapping of emerging keywords—such as "self-regulation," "affect," and "engagement"—reinforces the thematic emphasis observed in an earlier study by Artino and Jones (2012), which identified these as key mediators between EI and academic success in online environments. Furthermore, the clustering of research in language learning contexts, especially involving EFL learners, aligns with Zembylas (2008), who suggested that emotionally challenging disciplines such as language acquisition are particularly fertile ground for EI research.

Finally, the finding that contributions remain concentrated in high-income countries and select regions echoes earlier concerns raised by Kim and Lee (2021) about the limited cultural diversity in EI studies. This lack of representation from under-researched regions points to the need for more globally inclusive approaches, particularly since cultural norms significantly influence emotional expression and interpretation in digital education settings.

In sum, while the results of this study support and reinforce prior research into the role of emotional intelligence in ODODE, they also highlight persistent gaps—particularly related to teacher EI, regional diversity, and longitudinal research designs—that future studies must address to further develop the field.

The results of this research also provide important practical information. Some of these are listed below:

Professional development for trainers: As distance and hybrid learning become the norm, teachers need targeted training on digital emotional literacy. Modules should include strategies for recognizing and responding to students' emotions through text, tone of voice and digital artefacts (Derakhshan et al., 2020). Simulated scenarios and role-plays can help teachers to practice these skills.

Emotion-orientated learning design: Platforms such as Moodle and Canvas can integrate emotionally appealing functions such as real-time feedback, reflection prompts or emotional controls. Gamification elements (e.g. progress badges, supportive messages) can also increase emotional motivation and reduce anxiety during assessments.

Support at institutional and policy level: Institutions should recognize emotional intelligence as part of academic success. Policies should promote emotional well-being through student services, peer mentoring, and faculty support groups. Institutions such as the University of Toronto and MIT have piloted emotional check-in applications and virtual counselling that can serve as models for scalable interventions.

Equality and inclusion: Emotional intelligence training should also be inclusive. Learners from marginalized or underserved backgrounds may face additional emotional barriers in digital environments. Specialized EI support, culturally sensitive pedagogy and inclusive design principles can help to achieve equitable learning outcomes.

Cross-sector collaboration: Collaboration between educators, technologists, psychologists and curriculum developers is essential. Partnerships between education faculties and AI labs could, for example, lead to the development of empathetic chatbots or intelligent teachers capable of providing emotional support.

To summarize, research in the field of emotional intelligence in ODODE is dynamic and growing. However, to realize its full potential, it needs to grow not only quantitatively, but also in terms of conceptual depth, methodological rigor and practical integration. By responding to the opportunities and challenges highlighted in this report, the field can make an important contribution to more humane, effective and inclusive digital learning environments.

Limitations

Although, this bibliometric mapping provides an in-depth understanding of the research landscape on EI in ODODE, it has several limitations provided below:

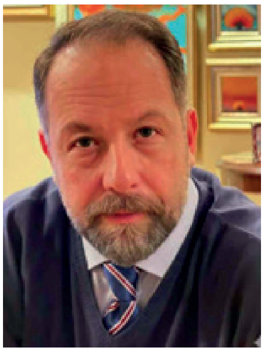
Scope of the studies - This study is limited to the studies included in the WoS and Scopus databases. Covering other databases like Google Scholar might provide more comprehensive dataset and results.

Language - This study included articles published in English only. There might be valuable studies on the topic published in other languages, such as Spanish and Chinese. Future research might also focus on those studies too for a better coverage.

Tool for analysis – In this study, R Studio based bibliometrix and biblioshiny programs were employed for the analysis. Different programs may also be used to compare the results.

Authors' Note: In this manuscript, *ChatGPT* was used for search purposes about some part of the literature. More specifically, free version of the *ChatGPT* was used to locate the previous review of research studies on EI in ODODE. A list of studies was accessed and then double checked by the researchers to eliminate hallucination. Additionally, after completing the writing of the manuscript some parts, such as Introduction, Discussions and Conclusions, were uploaded to the *Paperpal* application for language corrections.

BIODATA and CONTACT ADDRESSES of AUTHORS



Dr. Yavuz TUNA is an associate professor of New Media and Communications at Faculty of Communication Sciences, Anadolu University. Dr. Yavuz Tuna gained his Ph.D. in Communication Design and Management in January, 2008. His academic interest areas are emotions and emotional intelligence, psychology, sports communication, project design and management, open and distance learning, emotional AI. Tuna contributed to Anadolu University's open education initiatives by authoring 10 modules and two editing volumes. He has over than 10 journal articles published in international indexes, 2 international book chapters and other national and international articles, papers submitted to international meetings.

Yavuz TUNA
New Media and Communication Department, Faculty of Communication Sciences
Address: Anadolu University Yunus Emre Campus, 26470, Eskisehir, Turkiye.
Phone: +905323631232
E-mail: yavuzt@anadolu.edu.tr

Dr. Levent OZKOCAK is an assistant professor of Public Relations and Advertising Department at Faculty of Communication Sciences, Anadolu University. Dr. Levent Ozkocak gained his Ph.D. in Public Relations and Advertising at March, 2015. His academic interest areas are learning analytics, uses and grafitications, public relations and advertising, open and distance learning, education futures and e-learning. Ozkocak contributed to Anadolu University's distance and open education processes by writing 12 units and one edited book in the fields of communication and public relations. He served as the Assistant Coordinator in the Public Relations Program at Anadolu University's Open Education Faculty for 4 years.

LEVENT OZKOCAK
Department of Public Relations and Advertising, Faculty of Communication Sciences
Address: Anadolu University Yunus Emre Kampusu, 26470, Eskisehir, Turkiye.
Phone: +905325136968
E-mail: leozkocak@anadolu.edu.tr.edu.tr

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