

ONLINE STUDENT ENGAGEMENT IN THE TURKISH CONTEXT: A PRISMA-BASED SYSTEMATIC REVIEW

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Received: 15/05/2023 **Accepted:** 03/11/2023

ABSTRACT

The ability to interact or engage with the instructor, other students, and the content i.e., to experience online student engagement, is one main difference between traditional and digital media employed in teaching and learning processes. As literature on this topic in the Turkish context has proliferated, to date, virtually no systematic reviews of this research have been carried out in order to identify potential gaps in the literature. To address this issue, this study investigated previously conducted research in chronological order on student engagement at the post-secondary level in the Turkish context using a PRISMA-based systematic review screening process. The results show that online engagement research and practices have clearly increased and diversified over time. Specifically, online engagement research in the Turkish context has tended to focus on computer science students studying in online-only, LMS-supported environments where their behavioral engagement has been investigated quantitatively. Considering these findings, this systematic review suggests that future studies in the Turkish context should examine other fields besides computer science education, focus more on collaborative tools and the social dimension of engagement, use more qualitative methods, and investigate blended environments as well as online-only.

Keywords: Online engagement, engagement, distance education, e-learning, systematic review.

INTRODUCTION

For more than two decades, numerous studies have been conducted to reveal the effectiveness of teaching approaches comparing distance education and face-to-face education in terms of different variables. Most of these studies have investigated the extent to which classroom learning and teaching processes can be transferred to technology-supported environments. While most of the studies have shown that distance education is at least as successful as education in a face-to-face classroom environment, it is generally understood from many of these studies, that the difference between these two types of learning environments is not particularly meaningful or significant (see Nguyen, 2015; Ramage, 2002). In this regard, simply using technology to facilitate a lecture or presentation-based learning process in the classroom, i.e., a teacher-centered approach, adds little, if anything, to the educational environment. In contrast, a learning process in which technology has been used to facilitate a student-centered approach has often yielded more promising findings (Trinidad & Ngo, 2019; Bates, 2015). The most problematic aspect of distance education has always been the inability to foster adequate two-way classroom communication in digital environments, namely, the “interaction” variable. However, advances in technology in recent years have impacted this variable positively, making this criticism less valid than it once was, especially with enhancements in the quality of such two-way communication.

ONLINE STUDENT ENGAGEMENT

The main differentiating factor between traditional and digital media used in teaching and learning processes is the ability to interact, or engage with the educator, other students, and the content. The basic process of communication for learning processes is a two-step process: First, the messenger (educator) sends a message through a medium. Second, the message is received and decoded by the learners. In face-to-face environments, where traditional media like blackboards, smart boards or computer-projection systems are used, the process is primarily one-way. In contrast, in online environments, where digital media like video conferencing and learning management systems are used, users have greater abilities to interact and respond to the message—in other words, they can ‘engage’ with the message and messenger (eCampusOntario, 2018).

Ultimately, all instructional activities are communication processes and, in this process, the message, that is, the teaching content, is as important as the tools and methods. Online interaction not only occurs between instructors and learners, but also with the content (Anderson, 2009). Hence, as also stated by Anderson (2003), “Differentiating between high and low levels of interactivity is largely a quantitative exercise in which a researcher, developer, or the participants themselves, count the number of times they are actively engaged with the other participants or content” (p. 7). With these insights in mind, one can conclude that interaction causes an increase in engagement. However, just as there are various interaction types that cause engagement, it is clear that there

are also different types of engagement. Thus, Redmond, Abawi, Brown, Henderson, and Heffernan (2018) proposed a five-part “Online Engagement Framework for Higher Education” (Figure 1 below). Their purpose was to provide a conceptual framework for student engagement to be used as a planning and auditing tool to guide educators in order to improve engagement among online learners. Redmond and his colleagues (2018) proposed a theoretical view of student engagement including five interrelated elements that provide a tool for instructors, instructional designers, and researchers to facilitate and evaluate online student engagement.

To begin with, social engagement refers to students’ actions and investments leading to collegiate experience as defined by Knight (2013) which has been previously mentioned in the community of inquiry model as “social presence” by Garrison, Anderson, and Archer (2000). This type of engagement can be witnessed in the use of social forums, and open communication platforms like social media. Here, informal, and social interactions are addressed beyond formal study requirements such as work and study relationships. Thus, indicators of social engagement are building community, creating a sense of belonging, developing relationships, and establishing trust. *Cognitive engagement* refers to students’ involvement in the learning process to create meaning out of content, reflect on it, and break down complex ideas and difficult skills in a detailed way (Fredricks, Blumenfeld, and Paris, 2004). These ideas have been previously mentioned in the community of inquiry model as “cognitive presence” by Garrison, Anderson, and Archer (2000). This type of engagement can be observed as the use of mental abilities like judgement, justification, integration, exploration, decision making, and deriving conclusions. Thus, indicators of cognitive engagement are thinking critically, activating metacognition, integrating ideas, justifying decisions, developing deep discipline understandings, and distributing expertise.



Figure 1. Engagement Framework for Higher Education (adopted from Redmond, Abawi, Brown, Henderson & Heffernan, 2018, p. 189)

Behavioral engagement refers to students’ observable actions and evidence for involvement in the learning tasks such as adhering to rules and norms, asking questions, contributing to discussions (Fredricks, Blumenfeld & Paris, 2004), demonstrating high effort and persistence as well as self-regulating behaviors (Cheng, Liang, & Tsai, 2013; Young, 2010). This type of engagement shows similarity with “teaching presence” which also appears in the community of inquiry model by Garrison, Anderson, and Archer (2000). This type of engagement can be observed in academic reading, writing, and listening, planning, time management, and goal setting (Pittaway & Moss, 2014). Thus, indicators of behavioral engagement are developing academic skills, identifying opportunities and challenges, developing multidisciplinary skills, developing agency, upholding online learning norms, and supporting and encouraging peers.

Collaborative engagement refers to students' interaction with their peers, instructors, and other educational stakeholders to build networks and relationships to support the learning process. The use of supportive learning environments for students to collaborate is extremely important for effective integration of group activities and assessment in learning processes. This type of engagement can be observed in the collaborative use of tools for data sharing, image editing, idea exchange and discussion where many of the web 2.0 tools provide support. Thus, indicators of collaborative engagement are learning with peers, relating to faculty members, connecting to institutional opportunities, and developing professional networks.

Emotional engagement refers to students' involvement in subjective and objective variables of the learning process through a complex set of interactions which is also mentioned as "emotional presence" by Cleveland-Innes and Campbell (2012). Students' feelings and attitudes play an important role in learning since emotions not only modulate virtually every aspect of cognition but also motivate social behaviors (Tyng, et. al., 2017). This type of engagement is discernible in the form of interests, values, and emotions (Fredricks, Blumenfeld, & Paris, 2004). Thus, indicators of emotional engagement are managing expectations, articulating assumptions, recognizing motivations, and committing to learning.

Although there are different terms and definitions (including ones not mentioned here) used for addressing the engagement of students in their learning processes, the merging of these concepts in order to define human aspect in learning is quite obvious. Thus, in addition to the many other variables that affect the learning ecosystem, it is important to understand the role and importance of the term "engagement" in achieving effective and efficient learning outcomes.

WHY IS ONLINE ENGAGEMENT IMPORTANT FOR LEARNING?

Since every learning process is based on the exchange of information in the form of two-way interactions, it is obvious that each student has to maintain presence in these interactive learning situations through engaging in the activities. Hence, there are many studies that aim to reveal how this engagement occurs in different virtual environments, attempting to provide evidence in support to demonstrate that such engagement has occurred. We know from many studies that interactivity promotes active collaborative learning and engagement which has great potential to improve students' learning performance. Consequently, active collaborative learning improves students' engagement and learning performance (Blasco-Arcas, et. al., 2013).

In the literature, various instruments and methods that aim to measure different types of online engagement can be seen. These include self-report scales, interviews, observations, experience sampling, teacher ratings, eye-tracking, physiological sensors, log files, and content analysis (Greene, 2015; Fredricks & Mccolskey, 2012). Each instrument and each method have its own strengths and weaknesses. Different measurements can be used in combination to allow researchers to triangulate and establish the validity of the data (Greene, 2015).

The most utilized approach in assessing cognitive engagement is self-report scales. According to the literature, three streams of self-report measures exist. These include scales that measured: 1. motivations related to the school (e.g., students' beliefs about the value of schooling or control of schoolwork) 2. learning strategy use (i.e., self-regulatory, cognitive, and metacognitive strategies) 3. mental involvement or psychological investment of the students, including effort, persistence, and dedication (Fredricks & Mccolskey, 2012).

The next method that has been used to measure students' cognitive engagement is interviews. Researchers often asked the students for further explanations of their prospective or retrospective behaviours in structured interviews in order to obtain information about students' strategy use (Dent & Koenka, 2016). Another method for measuring cognitive engagement is observational methods at both the individual and classroom levels (Fredricks & Mccolskey, 2012). Some research (Helme & Clarke, 2001; Greene, 2015; Lee & Anderson, 1993) verifies that cognitive engagement can be reliably recognized by specific behavioral and linguistic indicators.

Experience Sampling Method (ESM) is yet another method for assessing student cognitive engagement, generally involving the use of electronic or digital devices to interrupt students in order to examine their thoughts and feelings during a specific learning moment (Xie et al., 2018). This method's most important characteristic feature is that students' feelings, thoughts, actions, etc. are measured regularly during an experience in an authentic context (Zirkel et al., 2015).

Teacher ratings are another measurement method for assessing students' cognitive engagement. The Reading Engagement Index (REI) developed by Wigfield et al. (2008) can be given as an example. It was developed for teachers to rate the engagement of each student in a reading task. Yet another measurement method is eye-tracking, which collects the eyes' positions and movements of students to infer their cognitive engagement (Antonietti, Colombo, & Nuzzo, 2015; D'Mello et al., 2017; Miller, 2015). Physiological methods such as electrodermal activity (EDA), electroencephalograph (EEG), electromyogram (EMG), etc. aim to measure the electrical signals produced in the skin. This also provides researchers with physiological data to make inferences about the cognitive and emotional states of the participants (Stevens, Galloway, & Berka, 2007; D'Mello et al., 2017). Since the log files provide information about students' learning activities in computer-based learning environments, cognitive engagement can also be assessed by extracting the students' cognitive and metacognitive strategies through logs of learners' behaviors (Chen & Pedersen, 2012; Bernacki et al., 2012). Content analysis is the last method of measurement of students' cognitive engagement. It detects the students' use of verbal languages or written materials (Tausczik & Pennebaker, 2010; Ireland & Henderson, 2014).

Even though the notion of behavioral engagement is well developed and has been explored in numerous studies in face-to-face settings, student behaviors in online settings are shown to be different (Louwrens & Hartnett, 2015). The nature of involvement in online learning, however, does not differ much from that defined by fundamental definitions of the term in traditional educational environments (Casimiro, 2015). The most used tool for measuring behavioral engagement is scales. Behavioral engagement scales, in which several of the items, such as attention and participation, reflect domain specific aspects of engagement, including emotional disengagement indicators such as frustration, anxiety, confusion; deep strategy use such as solving problems in various ways; and social engagement such as sharing ideas, building ideas, and collaborating with others. There are many other classroom observation instruments and protocols for measuring engagement of the students such as the Reformed Teaching Observation Protocol (RTOP; Piburn et al., 2000), VaNTH Observation System (VOS; Harris & Cox, 2003), STROBE (O'Malley et al., 2003), and the Classroom Observation Protocol for Undergraduate STEM (COPUS; Smith, Jones, Gilbert, & Wieman, 2013). In their article, Lane, and Harris (2015) developed a new measurement tool for Measuring Student Behavioral Engagement in Large University Classes, titled 'Behavioral Engagement Related to Instruction' (BERI) protocol, which can provide timely and formative feedback to the course instructor in the form of a graphical representation of student engagement.

Online learning allows students to interact and cooperate with other students while also engaging in active learning with the course content. Students willingly share their learning with other students in collaborative learning activities. This participation, in turn, stimulates and fosters interactions among students, who share their perspectives and explore new ideas while building on their existing knowledge, resulting in deeper learning. There are some tools that are used to measure the quality of collaboration. For instance, in their study, Lyndall and Elspethth (2015) utilized the two tools for assessing the quality of students' participation in the online learning process. These pedagogical tools are the Conservational Framework and Social Network Analysis (SNA).

The engagement scales assess the behavioral, emotional, and cognitive engagement aspects including persistence, disaffection, anxiety, planning, study management and so on. For instance, Motivation and Engagement Scale (MES), utilized by Martin (2009) comprises 11 scales, which assess indicators of students' engagement and motivation including study management, self-confidence, learning focus, persistence, planning, school valorization, disaffection, anxiety, self-sabotage, failure avoidance, and uncertain control. The Engagement Rating Sheet, developed by Reeve, Jang, Carrell, Jeon & Barch (2004) for trained raters to visit classrooms during learning process in the classroom to observe students' engagement, aimed to assess behavioral, emotional, cognitive, and agentic engagement.

Another tool of measurement is Engagement vs. Disaffection with Learning (EDL; Skinner, Furrer, Marchand, & Kindermann, 2008). The EDL is a 20-item instrument, which aims at behavioral and emotional engagement. This instrument assesses both the presence of engaged learning (behavioral and emotional engagement) and its absence (behavioral and emotional disaffection) (Veiga, 2014).

Compared with face-to-face environments, the major criticism for years was the lack of interaction in online learning environments. Since each learning process is based on different patterns and types of interaction, researchers tried to reveal this phenomenon from different perspectives. The abovementioned studies reveal

that much research has been conducted on this topic over several years. However, as most of the preceding studies were based on online education in western context, there is a clear need to collate and synthesize research in non-western contexts, in which cultural factors could play a significant role, with a view to improving practice and increasing interaction through digital tools and environments. This motivation has led to the design of the current study, which aims to reveal the current situation regarding online engagement in the Turkish context, exploring the types of online engagement research as reflected in the published literature on the target context.

The research was informed by a single overarching research question: How can a PRISMA-based systematic review contribute to a general understanding of an online engagement research within the Turkish context?

RESEARCH QUESTIONS

This study relies on the systematic review, a well-established methodology for conducting bibliographical research in order to synthesize key findings within a specific research area across a wide range of academic sources. Zawacki-Richter et al. (2020) note that “[i]n contrast to traditional or narrative literature reviews, that are criticized as being biased and arbitrary, the aim of a systematic review is to carry out a review that is rigorous and transparent in each step of the review process, to make it reproducible and updateable” (p. 161).

Nested within the research questions outlined in the introduction section above, several topic-specific sub-research questions were identified as a necessary means to conducting the systematic review as follows:

1. What key research trends and findings are discernible within this area in terms of
 - 1.1 year of publication?
 - 1.2 discipline of study?
 - 1.3 research methodology?
 - 1.4 platforms, technologies, and software?
 - 1.5 pedagogical strategy?
2. What are the emerging types of online engagement?
3. What are emerging themes based on the findings of the articles reviewed?

METHOD

This research constitutes a subsidiary component of a larger multinational research endeavor that focuses on the subject of online engagement within the Middle Eastern region. The geographical scope of this overarching project encompasses the Middle Eastern countries of Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syria, Tunisia, Turkiye, and the United Arab Emirates. Our involvement in this comprehensive initiative centers on the representation of the Turkish segment of this research, underscoring our specific focus on this distinct regional context.

This study employed a *Systematic Review* methodology, which is a type of literature review where the goal is to identify all studies relating to a specific topic through extensive database searches and multi-person screening of results using a precisely defined protocol. As a result, the systematic review approach is fairly broad. In other words, the application of this method means a detailed evaluation and interpretation by accessing various research sources on a particular research question and topic (Kitchenham, 2004). Specifically, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) systematic review approach was adopted for this study due to its widely recognized value as a thorough, transparent, and replicable method (see Page et al., 2021; Rethlefsen et al., 2021; Selcuk, 2019; Moher et al. 2015; Moher et al., 2009).

Regarding systematic review in general, it is beneficial for educational research in many aspects. It can provide access to the literature which has an ever-growing publication basis. Systematic reviews are clear about how the researcher has sourced the information, which ensures credibility and accountability for the literature review. Also, by not allowing researchers to “hide inside” the discourse of the account of knowledge, the systematic review makes visible the inherent biases, exposing, as it does, the conceptual and value orientations of several sources at once (Gough, 2007). Moreover, systematic reviews in higher education are highly sought

after and frequently cited due to their recognized reliability, which in turn, improves research and reporting quality. Systematic reviews can also help educational scholars expand on their existing work by highlighting specific strengths and flaws in the literature as mentioned in the introduction above. This method also helps researchers and practitioners understand and influence the overall practice and status of higher education research at the same time (Bearman et al., 2012). Figure 2 highlights the methodological procedures that were taken in order to perform the systematic review while keeping all of the aforementioned factors in mind.

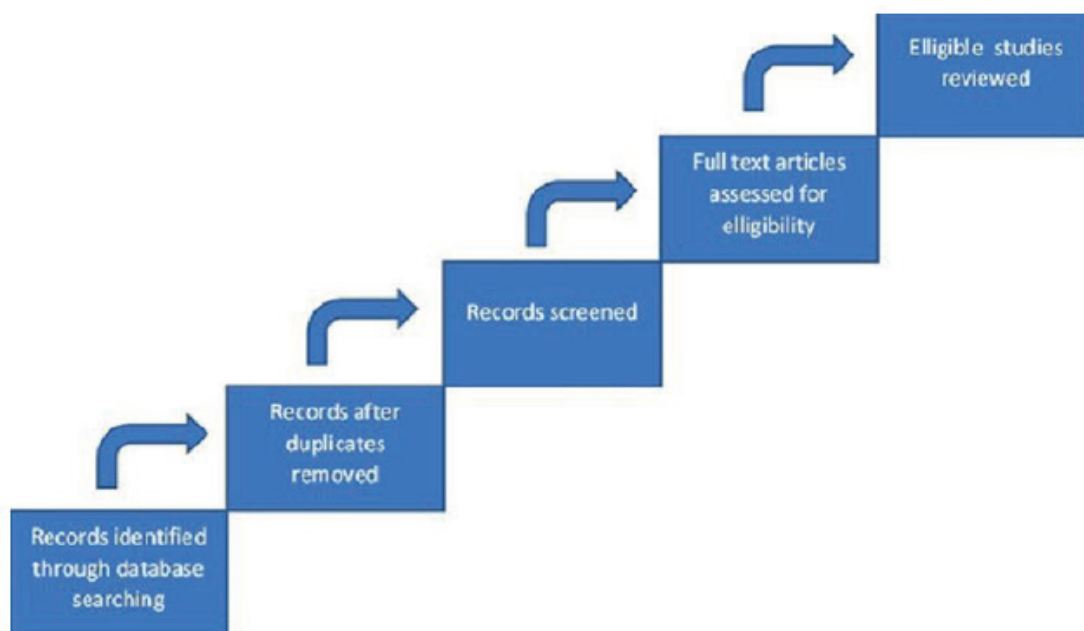


Figure 2. Steps In the Study

Generally consisting of three stages, should be taken to conduct systematic review research by various steps (Carver et al., 2013). These three stages followed in this study are respectively; firstly, planning phase, which is using for selecting the database to investigate, defines the key criteria for whether the investigation called in the selected database is included in the investigation and the content is achieved according to corresponding criteria, and the second phase is execution which means determining the study and the last phase is documentation which is also reporting process for findings.

- 1) The planning phase includes:
 - Motivation for conducting the review
 - Research questions
 - Search strategy (search strings, databases)
 - Methodology for locating primary studies (inclusion, exclusion criteria)
 - Creating form for data extraction
- 2) The execution phase includes:
 - Identifying relevant research using the search strategy
 - Selecting primary studies using the inclusion and exclusion criteria
 - Evaluating selected studies using the quality assessment criteria
 - Extracting required data using the data extraction forms
 - Analyzing extracted data and synthesize resulting information to draw conclusions
- 3) The documentation phase includes:
 - Defining the dissemination strategy
 - Formatting the review report

As can be seen from the steps mentioned above, the motivation for conducting this review was to know what scholars had studied about online engagement in higher education and how their research focus has changed based over several years including the early Covid-19 pandemic period.

Procedurally, first, literature searches were conducted in November of 2020, utilizing a combination of keyword and subject heading searches conducted in multi-language databases (Academic Search Premier, ERIC, PsycInfo, ProQuest, Scopus, Web of Science) as well as the Turkish database Dergipark. Database searches were limited by year from 1995 to present and the language for the publications was set to “Turkish” in multi-language databases (see Appendix). During title/abstract and full-text screenings, inclusion and exclusion criteria were applied to determine eligibility (see Table 1 below).

Table 1. The Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Online or hybrid learning	K-12 education
Student engagement	Face-face learning only
Academic research	
1995-2020	
Higher education	
Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syria, Tunisia, Turkiye, United Arab Emirates, West Bank and Gaza, Yemen	

To limit selection bias, screenings were conducted by four of the authors (ESO, HA, DC, YG). All articles were screened by at least two reviewers and conflicts were resolved by one of the remaining reviewers. In order to prevent the inclusion of off-topic sources in the final collection of research articles, several exclusion criteria, i.e., terms that would disqualify a source on the grounds that it was not relevant to the research focus on online post-secondary were identified as follows: Personal narratives/autoethnography, PPT/Prezi presentations, K-12 education, Blogs, and Correspondence (snail mail) learning.

The final search resulted in 1366 studies from all databases, and these were imported for screening into Covidence systematic review platform. 234 duplicate studies were removed automatically. 1132 studies were screened by researchers, 937 studies were marked as irrelevant. 185 full-text studies were assessed for eligibility, 95 studies were excluded because of the reasons such as wrong sample, wrong setting, wrong study design, wrong language, wrong outcomes. Finally, 90 studies were included in the systematic review process. Descriptive quantitative analysis was used for the first two research questions whereas qualitative inductive approaches were selected for the analysis of the third research question.

Data Collection

As previously delineated, the present study serves as a subordinate component of a multinational research project. In accordance with the parameters established by the project initiators, data collection was undertaken by the implementation of various search strings (see Appendix). As the Turkish research group, we collected data within the DergiPark database, selected for its user-friendly interface, comprehensive article coverage, and compatibility with the specific requirements of our data collection process. The imperative needs associated with the execution of a large-scale systematic review necessitated the utilization of this database, as it facilitates advanced research through the application of Boolean operators (i.e., “and,” “or,” “not”), permits the filtration of search outcomes by several indicators. Furthermore, it is essential to download the research results, including abstract, title, and author, in an appropriate format for the Covidence (<https://www.covidence.org/>) systematic review platform. Subsequently, upon successfully downloading the search results in a designated file format, the acquired data set was uploaded to the Covidence platform. Moreover, studies pertaining to the Turkish context, identified during the search processes conducted by research groups from other countries, were integrated into the Covidence platform.

The culmination of the research process yielded a total of 1366 scholarly investigations from diverse academic databases, all of which were subsequently imported into the Covidence systematic review platform for further examination. Automatically, 234 redundant studies were extracted, thereby streamlining the corpus for meticulous scrutiny. We as Turkish researchers then diligently reviewed the remaining 1132 studies with title and abstract only, culminating in the determination of 937 as bearing no relevance to the subject matter at hand. Following this initial screening phase, we conducted a comprehensive assessment of the eligibility of 185 full-text studies, leading to the exclusion of 95 studies due to a range of factors, including incongruent sample selection, inappropriate contextual settings, inapposite study designs, linguistic disparities, and incongruous outcome measures. Ultimately, a discerning and judicious review process resulted in the inclusion of 90 studies in the systematic review, as visually depicted in Figure 3.

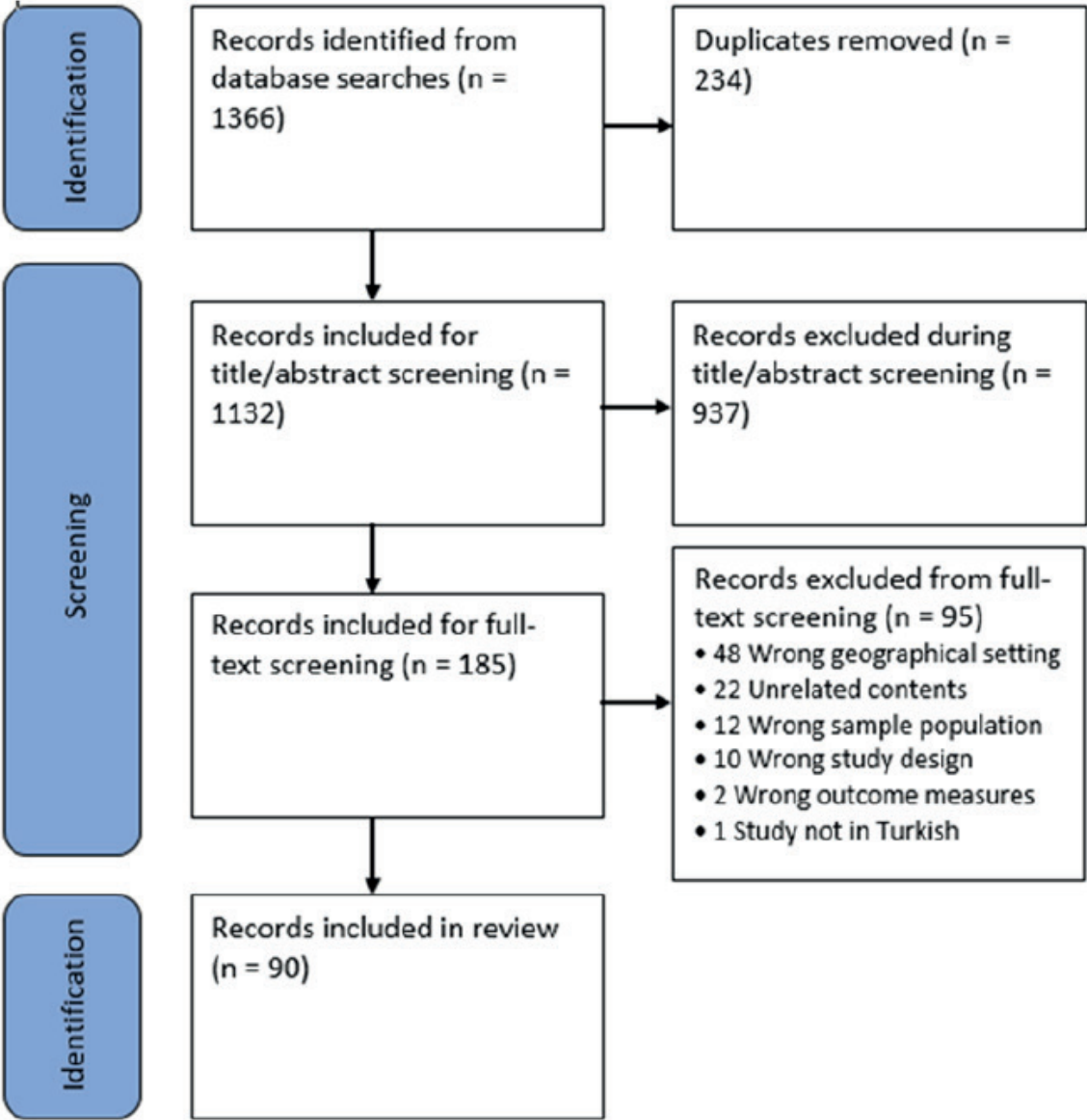


Figure 3. The Process of Systematic Review

Addressing the validity and reliability of data collection processes is pivotal in ensuring the robustness and trustworthiness of our research endeavors. In the context of our systematic review, a meticulous approach was undertaken to enhance both the validity and reliability of the collected data. To establish data validity, stringent inclusion and exclusion criteria were employed during the screening process. This entailed the careful selection of studies that were most pertinent to our research objectives. Additionally, the research team utilized standardized protocols and guidelines to assess the eligibility of full-text studies, ensuring that each study contributed directly to the research questions under investigation. Moreover, inter-rater agreement among researchers was monitored to minimize subjectivity in the inclusion and exclusion of studies. Reliability in data collection was reinforced through consistent and well-documented procedures. Detailed documentation was maintained at each stage of the study selection process, from initial database searches to the final inclusion decisions. In cases where potential ambiguities arose, discussions were held among the research team to reach a consensus. This process of maintaining clear and comprehensive records and engaging in iterative discussions contributed to the reliability of the data collection and ensured the consistency of decision-making throughout the study selection process. These measures were integral to the validity and reliability of the data collection procedures, ultimately underpinning the integrity of the systematic review and enhancing the trustworthiness of the research outcomes.

Data Analysis

A rigorous and transparent data analysis process is fundamental to ensuring the validity and robustness of our research. Our data analysis procedures were tailored to address the specific research questions and involved both quantitative and qualitative methodologies.

For the first two research questions [(1) What key research trends and findings are discernible within this area? (2) What are the emerging types of online engagement?] we employed a descriptive quantitative analysis approach. Descriptive quantitative analysis aims to identify patterns within data to determine the characteristics of a specific phenomenon or the world at large, addressing questions about who, what, where, when, and to what extent. It simplifies data, providing extensive information on capabilities, needs, methods, practices, policies, populations, and settings, customized to specific research or policy inquiries (Loeb et. al, 2017). Descriptive quantitative analysis (DQA) is a research method used to summarize and present data in a structured and interpretable manner, typically involving the use of numerical and statistical techniques (Creswell, 2017). This approach is particularly useful when researchers aim to describe and understand the key characteristics of a dataset without making inferences or predictions (Vogt & Williams, 2011).

The analysis of the third research question [(3) What are emerging themes based on the findings of the articles reviewed?] adopted a qualitative inductive approach. This entailed a more interpretive and in-depth exploration of the data to identify patterns, themes, and insights that could not be adequately captured through quantitative means (Smith, 2015). Qualitative data, such as textual information and thematic content, were systematically reviewed and analyzed using established qualitative research methodologies, such as thematic analysis or content analysis. This qualitative analysis allowed for a deeper understanding of the nuances and contextual factors surrounding the research question.

Throughout the data analysis process, the research team adhered to a transparent and systematic approach. Analytical decisions, coding schemes, and interpretations were documented, and regular discussions were held to ensure consistency and rigor. By employing a combination of quantitative and qualitative methods, our data analysis aimed to provide a comprehensive and refined perspective on the research questions, enhancing the validity and reliability of our findings.

FINDINGS

The findings of the qualitative analysis derived from the articles are presented in parallel with research questions where some findings are presented in quantitative terms while others are presented as emerging themes.

Current Situation of Studies about Online Engagement for Turkish Context

Number of the Reviewed Articles according to Year of the Publication

The articles in which online engagement is studied have been increasing yearly. As seen in Figure 4 below, papers on this topic started to be published beginning in 2008. Of these, approximately 80% of the papers were published after 2016. In 2015, the Journal of Open Education Practices and Research (AUAd) started to be published and the discipline of Open and Distance Learning was accepted as an associate professorship field by the Interuniversity Board of Turkiye, which may account for the marked increase in articles on this topic between 2016-2018. The second sharp increase is seen in the year 2020, the beginning of the COVID-19 pandemic, which shifted attention to online learning for obvious reasons.

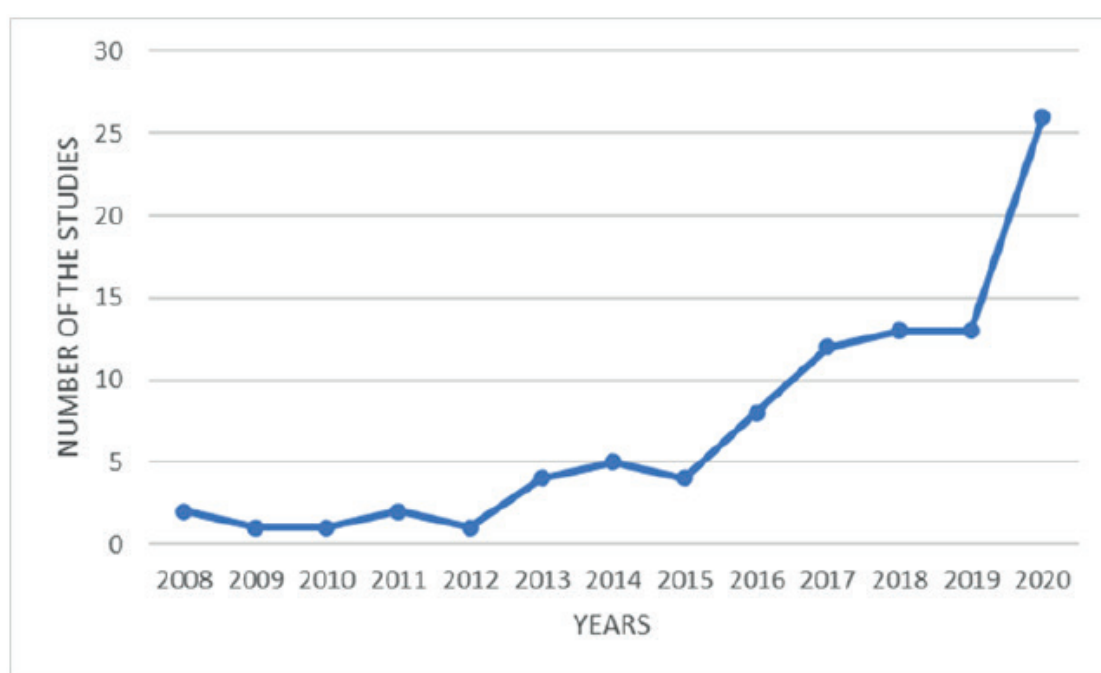


Figure 4. Number of the Reviewed Articles According to the Year of the Publication

Distribution of the Reviewed Articles according to the Discipline

It is seen that most of the studies are in the field of computer science with 28% of studies (except for not specified) when the distribution according to the field of study is examined (Figure 5 below). Computer science is followed by the educational sciences (18%) and language disciplines (10%). The fact that online engagement has mostly been studied in the fields of computer and educational sciences suggests that there is overlap between online education (which typically involves computer use), computer science, and educational science. Thus, in the Turkish context, it is fair to say that computer science and educational sciences appear to be the most connected fields to distance and online education.

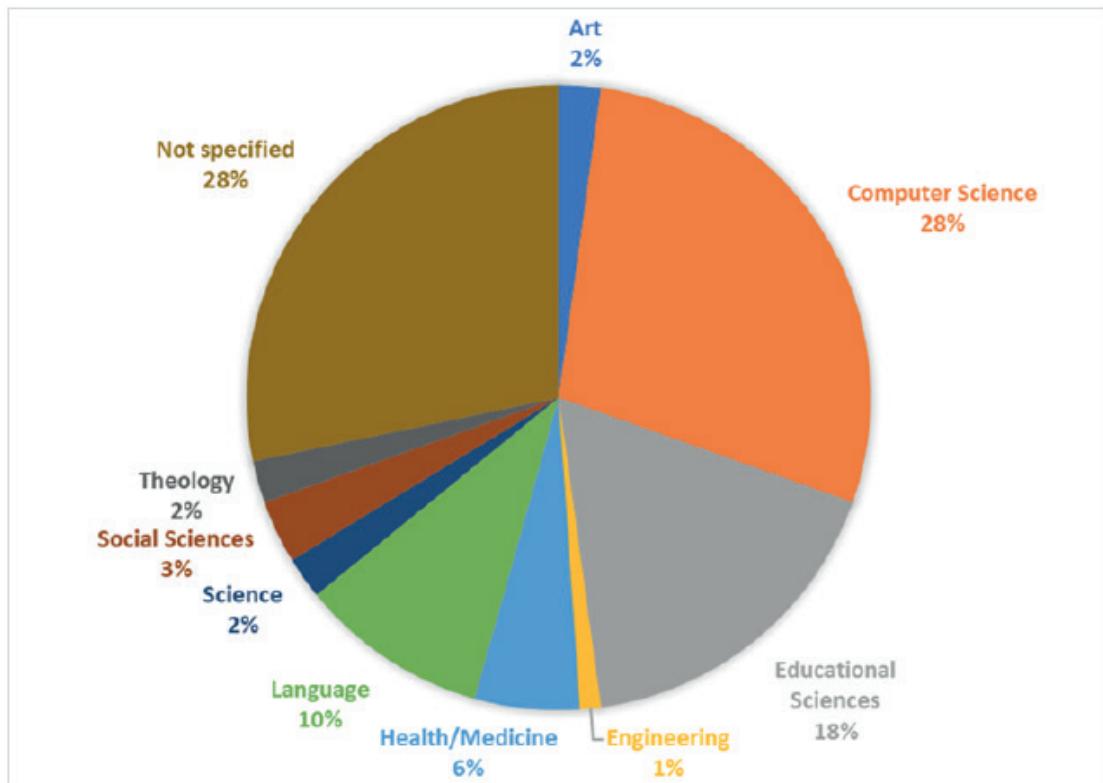


Figure 5. Distribution of the Reviewed Articles According to the Discipline

Distribution of the Reviewed Articles according to the Data Collection Type

As seen on Figure 6 below, most of the studies collected made use of quantitative methods (56%). Quantitative methods were followed by qualitative methods (23%). Only 12% of studies were mixed. As a data collection tool, questionnaires were used mostly i.e., 42 papers out of 92 studies in total. 12 studies were experimental studies with control groups while 26 studies were descriptive.

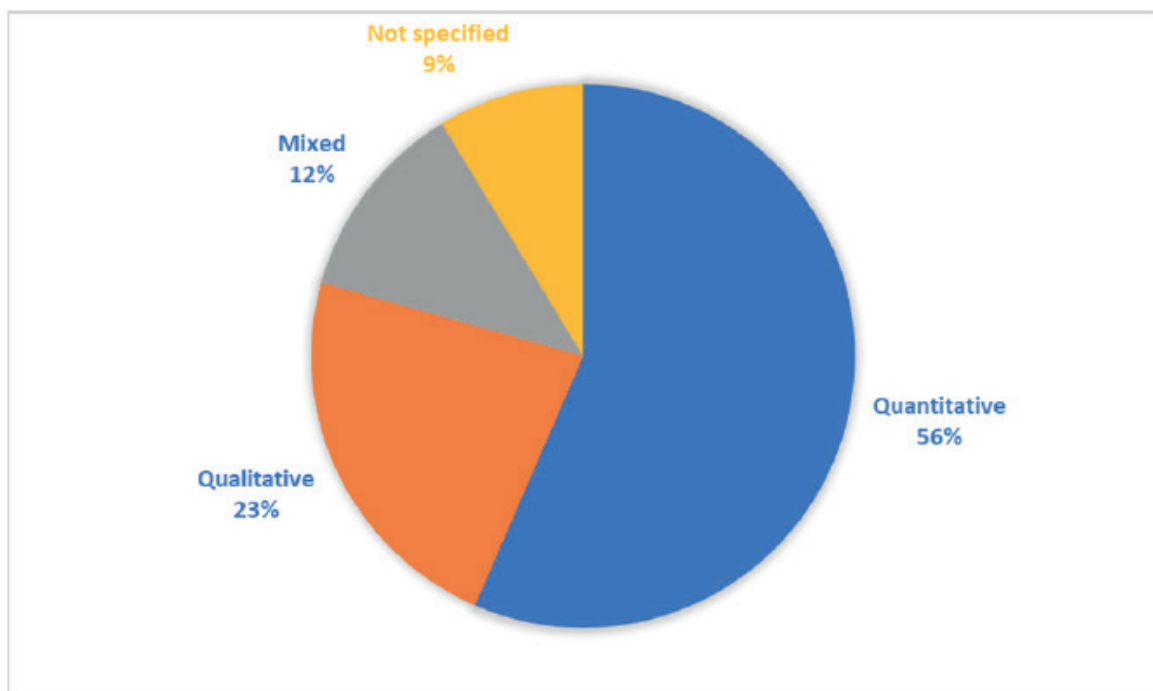


Figure 6. Distribution of the Reviewed Articles According to the Data Collection

Distribution of the Reviewed Articles according to the Platforms, Technologies, and Software

As seen on Figure 7 below most of the studies (36%) used a Learning Management System (LMS) like Blackboard, Canvas, Moodle, Google Classroom, Edmodo, Angel, WebCT, Sakai, D2L and Brightspace as the online platform. While 5% of the studies used social media platforms such as Facebook, Twitter, Discord, Instagram, WhatsApp, YouTube, Telegram, TikTok, in another 5% of the papers mobile learning was studied. Only 2% of the studies used Virtual Reality (VR) or Augmented Reality (AR) and Videoconferencing tools such as Zoom, MS Teams, Skype, Facetime.

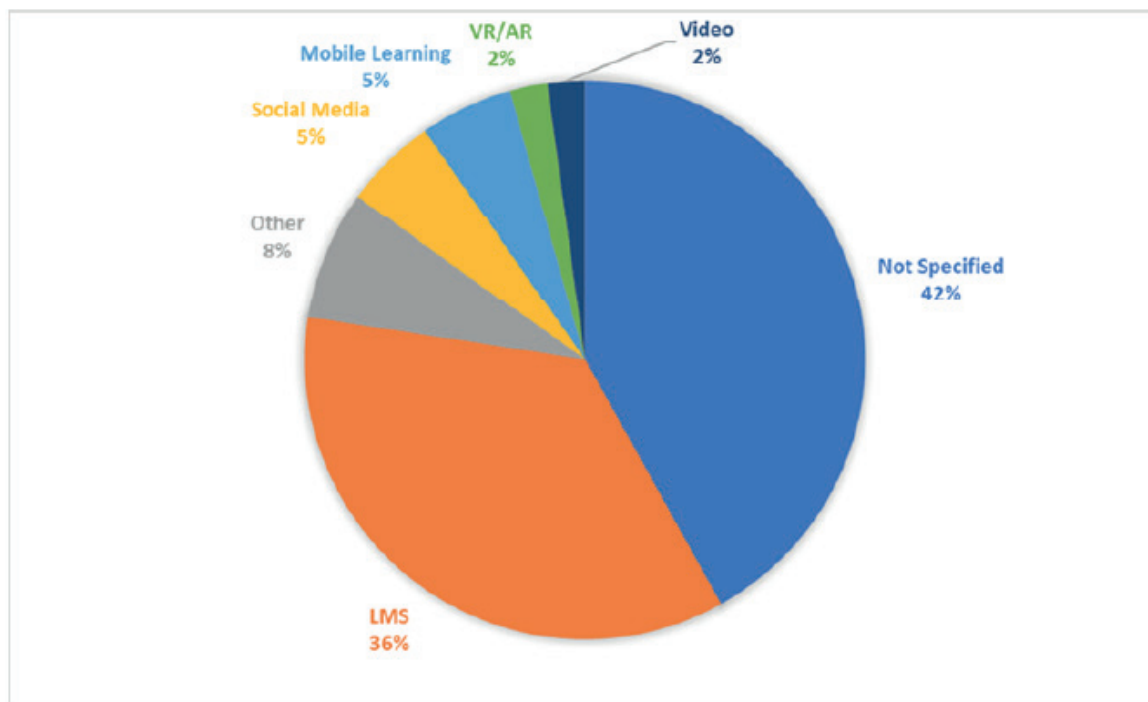


Figure 7. Distribution of the Reviewed Articles According to the Platforms, Technologies, and Software

Distribution of the Reviewed Articles according to Pedagogical Strategy

The most used pedagogical strategy was online only techniques (48%) such as interactive online lectures and recorded lectures (Figure 8). Pedagogical strategy was not mentioned in 32% of the papers. Blended learning strategies such as synchronous and asynchronous chat, discussion forum and flipped classroom were discussed in 17% of the papers. Only 1% of the papers focused on collaborative learning, while 2%

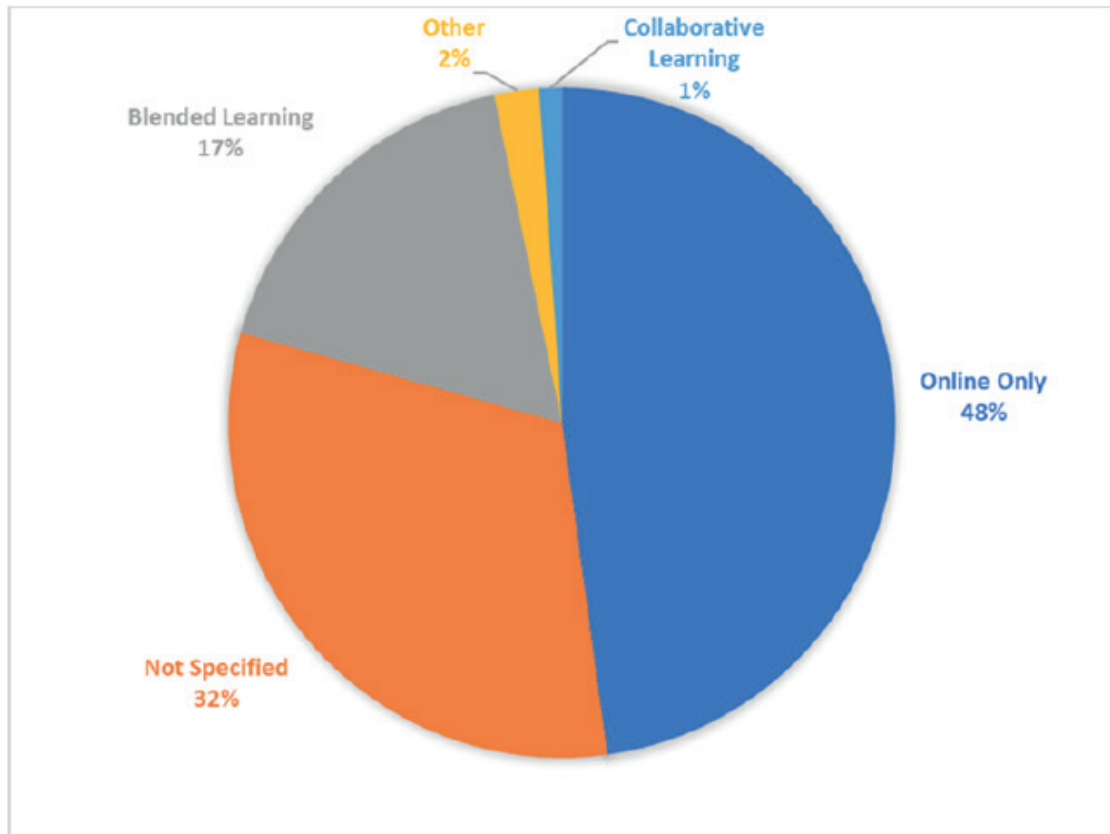


Figure 8. Distribution of the Reviewed Articles According to the Pedagogical Strategy

Emerging Types of Online Engagement

For this research question, indicators provided within the “Online Engagement Framework for Higher Education” suggested by Redmond and his colleagues (2018) were used as the criteria for exploring emerging types of online engagement. When the classification of article types according to engagement categories was completed, it revealed that the affective dimension of engagement (54%) was most studied dimension in the Turkish context followed by the behavioral dimension (32%) (Figure 9). Less research was encountered regarding cognitive (25%) and social (10%) dimensions, and unfortunately no research was conducted on the collaborative dimension. Since collaboration is the most important key factor for social and cognitive engagement, it was surprising that no researchers felt a need to investigate this construct.

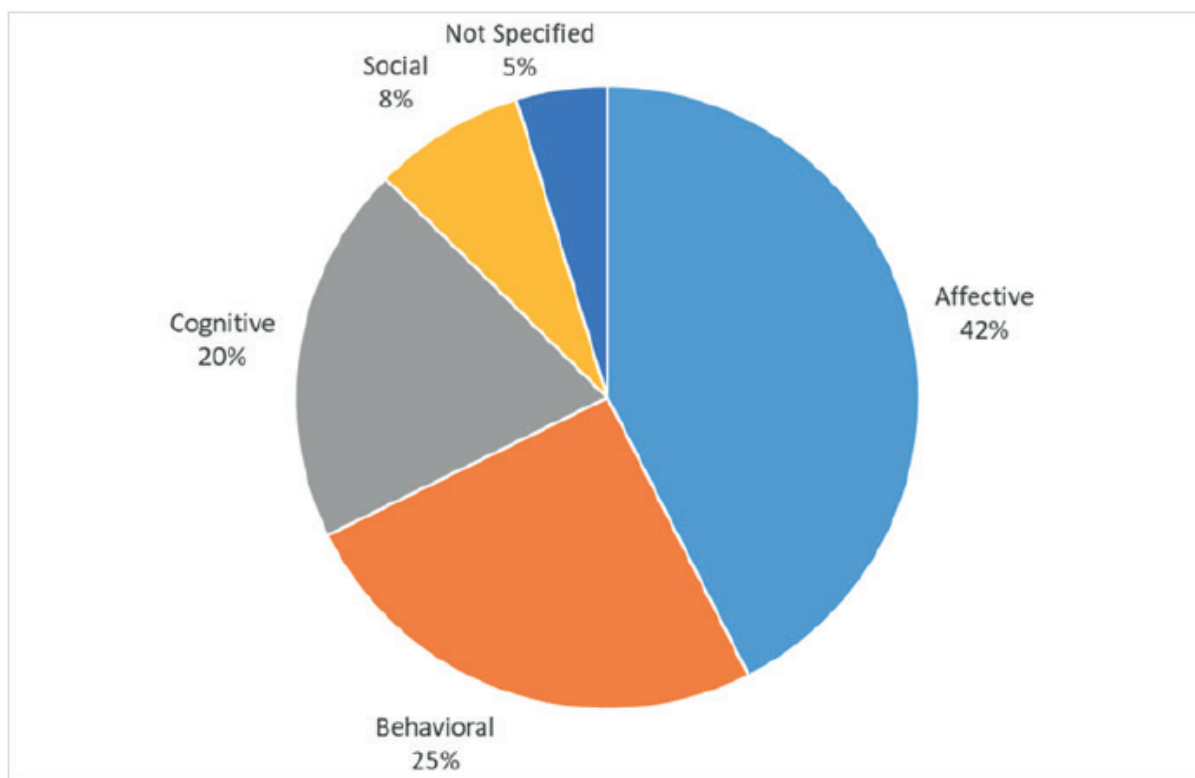


Figure 9. Emerging Types of Online Engagement

Emerging Themes Based on the Findings of the Reviewed Articles

An inductive analysis on the findings of studies was also carried to reveal the impact of the Turkish studies on the online learning engagement literature (Table 2). The most significant findings were that “learners’ performance increased due to the use of digital technologies, materials and educational videos” where technologies mentioned for online learning were gamification, mobile technologies, social networks (N=25). Some studies revealed that learners’ performance increased due to the use of digital platforms, i.e., engagement is affected and increased through the use of digital technology. In five studies mobile learning was specifically mentioned as a favored method for improving learners’ performance. On this topic, one study reported that “students who use the gamified environment show higher participation” (Tunga & Inceoglu, 2020) whereas another reported “learners’ performance increased due to augmented reality” (Koyun, Budak & Cankaya, 2018). Yet another study underlined that “blended learning enriched with different methods has a more positive effect on student achievement” (Cirak Kurt, Yildirim & Cucuk, 2018). A second emerging theme was that learners favored blended learning based on their perception of the advantages of online learning (N=13). The third emerging theme was the lack of social engagement in Turkish online learning and the ways to increase social presence (N=9). On this topic, one study reported that “not getting timely feedback negatively affects online engagement” (Elcil & Sahiner, 2014) whereas another focused on existing problems with online courses that are based on practice due to lack of expected engagement. Self-efficacy beliefs from a personal point of view and pedagogical concerns from an instructional design point of view were also mentioned in the reviewed articles as important factors that affect engagement (N=8). One study reported that “design of the teaching practice affects learner performance” (Eroglu & Kalayci, 2020) whereas another stated “use of different pedagogical approaches enhances learners’ performance” (Horzum & Balta, 2008). In another study it is reported that “wrong pedagogical choices affect online engagement” (Elcil & Sahiner, 2014) and “inefficacy of management of online learning and digital materials” (Karadag & Yucel, 2020), which again refers to the instructional design point of view, underlining the importance of design for promoting engagement in online learning.

Some studies reported the effect of attitude, effort, and ability on engagement (N=8). One study reported that “affective variables can affect satisfaction of learners” (Eygu & Karaman, 2015) whereas in another

it is mentioned that the “nomophobia variable affects intrinsic motivation positively” (Bayram, Zeybek Yilmaz, Sozen & Bayer, 2019). Some studies investigated the e-learning readiness of learners and found lack of readiness to be high (N=6). However, this variable will likely decrease in relevance in the future because as virtually all students and instructors have been forced to learn and teach online, their readiness has had to increase.

Engagement in the articles reviewed was investigated in terms of relationships between social engagement—such as sense of class community—and cognitive engagement, and positive relationships are found between these confounding variables (N=4). Related to these arguments, one study reported that “as students’ emotional and behavioral resistance levels increase, distance education is less instructive and their tendency to distance education decreases” (Genc, 2020).

Other important miscellaneous findings were identified. One article mentioned that “participation in online courses and monitoring of course video recordings at a later time enhances academic success” (Ergun & Kurnaz, 2019) and another that “participation in virtual classroom sessions can be improved through continuous information and guidance” (Kirmaci & Acar, 2018), highlighting the importance not only of engagement but also of as instructor involvement and instructional design.

Table 2. Emerging Themes Based on the Findings from the Articles

Theme	Frequency (N)
Engagement is affected and increased through the use of technology	25
Impact and advantages of blended learning	13
Lack of social engagement + ways to increase social presence	9
Self-efficacy beliefs	8
Effect of instructional design	8
Affective engagement	8
E-learning readiness	6
Relations between engagement types (social vs cognitive)	4

DISCUSSIONS AND CONCLUSION

In the recent past, the spread of the coronavirus (COVID-19) epidemic in the early 2020s caused a global emergency. With its unprecedented impact on higher education, the pandemic has limited education to online teaching and learning. This sudden shift showed how important the active participation of students in distance education and online engagement is (Dahleez et al., 2021). In this context, the purpose of this research was to systematically review the Turkish-language research on online engagement from 1995 - 2021 and uncover the pedagogical principles and methodologies that may be used to promote involvement in digital learning processes. In addition, this study was conducted to reveal the current situation regarding online student engagement research in the Turkish context, showcasing the research undertaken on this topic, especially the types of online engagement studied.

Through this systematic review, a final set of 90 typically relevant studies were identified, using the PRISMA method, a rigorous screening process. The first level of analysis was to examine research trend by year. It was evident that the number of papers concerning online engagement has increased yearly, likely the effect of a gradual increase in technology use in education in Türkiye. The publication of the Journal of Open Education Applications and Research (AUAd) and the acceptance of the Open and Distance Education discipline as an associate professorship field by the Interuniversity Board (Bozkurt, 2017) may account at least in part for the rapid shift in the number of papers published after 2016.

Considering the distribution of the reviewed articles according to the discipline, it was found that most of the studies were in the fields of computer science with 28%, followed by educational sciences (18%) and language disciplines (10%). Given the increasing expansion of online computer science degrees including completely online university programs and MOOCs, it is not surprising that online engagement is the most studied topic in current research (Ruthotto et al., 2020). In this regard, it was interesting to note one study

that indicated that offering computer science-related courses in online format did not seem to negatively impact active participation of students when compared to face-to-face format (Basu, Heckman & Maher, 2021). Indeed, according to another study, the majority of students seem to prefer learning programming from the comfort of home (better computer and internet) to face-to-face education (Nguyen et al., 2018).

Examining the distribution of the reviewed articles according to the data collection type reveals that most of the studies were collected through quantitative methods (56%), while qualitative methods were used in 23% and mixed methods in 12% of the total papers. However, in another article which brings together distance education themed studies, qualitative methods are the most common. In fact, similar to our review, quantitative methods have been leading since 2020 (Siraz, 2021). The reason for this difference may be that the study mentioned above deals with a 3-year period starting from 2017. As a matter of fact, this study is a more comprehensive study covering a period of 12 years starting from 2008.

Considering the platforms where the studies were conducted, Learning Management Systems (LMSs) are the most used technology in the reviewed papers. This seems to be but one among many factors that enable students to engage in the online learning process. Another factor appears to be focusing on student performance by screening. Thus, embedded learning analytics tools seem to help identify students' needs, allowing the institution to map these needs to learning objectives (Ismail et al., 2021).

Considering the pedagogical strategies in the studies mentioned, online-only strategies were the most frequently encountered strategies for all the papers in total. Nevertheless, when compared to adopting an online-only delivery style, the blended delivery format appears to provide clearer instructions to learners consequently boosting their motivation, satisfaction, and engagement (Lim, Morris & Kupritz, 2007). In light of such earlier research, it was fully expected that the Turkish research would yield more articles where blended learning was adopted as a pedagogical strategy. However, one explanation for the preponderance of online-only strategies in the literature might be the perceived challenges that blended learning presents to instructors within the Turkish learning context: having to organize online and face-to-face activities, being more flexible, supporting interaction, tracking students not only online (it is easy to use learning analytics for online classes), but also face-to-face, and facing differences in student motivation in online and face-face instruction (Boelens, De Wever, & Voet, 2017).

The classification of article types according to engagement categories revealed that Turkish online engagement research is mainly focused on the affective/emotional dimensions of online engagement. This is not a surprising result since online engagement is defined as interaction between learners and content, and instructor and colleagues, through digital tools and environment. Collaborative engagement necessarily requires willingness and motivation to initiate collaborative activities as well as access to tools that can guarantee its success. Considering this difficulty, it comes as no surprise that the research encountered here focused first and foremost on individual properties related to engagement followed by the behavioral dimension as a second area of focus. Thus, our research has discovered a clear gap in the literature, that of collaborative engagement. As a result, it is recommended that, in order to keep learners' engagement continuous, educational researchers should turn their attention toward investigating the social dimensions by focusing on collaboration between learners in future studies (Martin & Bolliger, 2018).

This research also aimed at revealing important findings from the reviewed articles. The major finding was that "engagement is affected and increased through the use of technology" (Karakis, 2020; Koyun, Budak & Cankaya, 2018; Yilmaz, 2017) which underlines the importance of socialization and use of collaborative tools (Koranteng, Wiafe & Kuada, 2019). This finding is parallel with the second emerging fact that use of blended learning has an important impact on engagement in Turkish education since this approach is implemented through various online learning technologies. Thus, this third emerging finding further supports our hypothesis that there is an apparent lack of social engagement in online ecosystems and instructors need to look for ways to increase social presence (Seifert, 2016; Mebert, et. al., 2020).

In summary, highlights from current study are as follows:

1. The PRISMA approach was indeed a useful, systematic method for exploring online engagement literature in the Turkish context
2. As expected, the number of studies on online engagement has increased over the years; generally, computer science is the most represented, along with quantitative methods as the data collection type,

LMSs as platforms, and online-only techniques as a pedagogical strategy. In order to add diversity to the literature in future studies, online engagement studies can be directed to different fields other than computer science; qualitative methods can be emphasized; platforms such as social media and VR/AR can be used more frequently; and blended learning strategies can be adopted.

3. Although current Turkish research studies focused on affective behavioral dimensions of online engagement, more research is needed in the future about cognitive engagement, as well as social and collaborative engagement.
4. Engagement is mostly shaped around the use of technology, and that is why besides the affective, behavioral, and cognitive dimensions, future research should also address collaborative tools and the social dimension of engagement.

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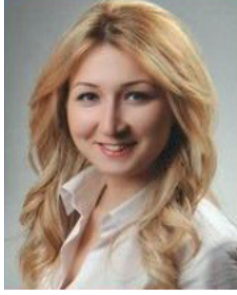
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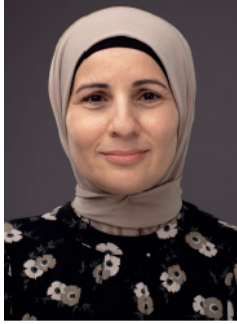
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APPENDIX

Search Strings

Base search strategy used in ERIC. All other databases using the same search with adjustments made for database search syntax requirements.

- 1 | (“Web 2.0” or “app based” or “asynchronous” or “augmented reality” or “blended learning” or “clicker assisted” or “collaborative online international” or “collaborative online learning” or “computer-assisted instruction” or “computer-assisted language learning” or “computer-based instruction” or “computer-based learning” or “computer-mediated learning” or “computer-supported collaborative learning” or “computer-supported cooperative learning” or “computer-supported cooperative work” or “computer-supported learning” or “computerized” or “cyber space” or “cyber-school*” or “Cyberspace” or “digital education” or “Digital Learning” or “distance education” or “distance eLearning” or “distance learning” or “distance teaching” or “e Learning” or “e-Education” or “e-Learning” or “e-universit*” or “Edtech” or “educational technolog*” or “Edutech” or “eLearning” or “gamification” or “gamified” or “interactive online” or “learning management system*” or “LMS” or “long distance learning” or “long distance teaching” or “massive open online course*” or “mobile learning” or “MOOC” or “online collaborative learning” or “online course*” or “online education” or “online education” or “online instruction” or “online learning” or “online teaching” or “online universit*” or “online workshop*” or “personal learning environment*” or “remote instruction” or “remote learning” or “remote teaching” or “smart phone app*” or “smartphone app*” or “social network*” or “SRS” or “student response system*” or “technology enhanced learning” or “technology mediated” or “technology-enhanced” or “technology-mediated” or “user generated content” or “virtual classroom*” or “virtual learning” or “virtual learning environment*” or “virtual reality” or “virtual teaching” or “web based seminar*” or “web conferenc*” or “web course*” or “web-based instruction” or “web-based training” or “web-enhanced instruction” or “web-enhanced learning”).tw.
- 2 | (Blended Learning or Computer Mediated Communication or Educational Technology or Technology Uses in Education or Online Courses or Electronic Learning or Instructional Innovation or Technology Integration or Social Networks or Internet or Handheld Devices or “Web 2.0 Technologies” or Social Media or Computer Assisted Instruction or Computer Assisted Testing).sh.
- 3 | (college* or universit* or graduate or undergrad* or seminary or higher education or technical or vocational or college prep* or informal learning or formal learning or lifelong learning or continuing education or adult education or Tertiary education or post secondary education or postgrad* or student or pupil).tw.
- 4 | (Colleges or Universities or Graduate Students or Undergraduate Students or Higher Education or Lifelong Learning or Postsecondary Education).sh.
- 5 | (Algeria or Algerian* or Bahrain or Bahraini* or Egypt or Egyptian* or Iran or Irani* or Iranian* or Iraq or Iraqi* or Israel or Israeli* or Jordan or Jordanian* or Kuwait or Kuwaiti* or Lebanon or Lebanese or Libya or Libyan* or Morocco or Moroccan* or Oman or Omani* or Palestine or Palestinian* or “West Bank” or Gaza or Gazan* or Qatar or Qatari* or “Saudi Arabia” or Saudi* or Syria or Syrian* or Tunisia or Tunisian* or Turkiye or Turkish or Turks or “United Arab Emirates” or Emirati* or Yemen or Yemeni* or MENA or “Middle East” or “North Africa” or “North African” or “Arabian Gulf” or “Middle Eastern” or Arabian).ti,ab.
- 6 | #1 OR #2
- 7 | #3 OR #4
- 8 | #6 AND #7 AND #5
- 9 | #8 Limited to 1995 to Current