SINIRSIZ EĞİTİM VE ARAŞTIRMA DERNEĞİ

Sınırsız Eğitim ve Araştırma Dergisi

Eğitim ve Araştırma Education and Research

The Journal of Limitless Education and Research

Mart 2025
Cilt 10, Sayı 1

March 2025
Volume 10, Issue 1

The Journal of Limitless Education and Research

March 2025, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi

Mart 2025, Cilt 10, Sayı 1

İletişim
Sınırsız Eğitim ve Araştırma Derneği
06590 ANKARA – TÜRKİYE
e-posta: editor@sead.com.tr
sead@sead.com.tr

Contact
Limitless Education and Research Association
06590 ANKARA – TURKEY
e-mail: editor@sead.com.tr
sead@sead.com.tr

Sınırsız Eğitim ve Araştırma Dergisi (SEAD), yılda üç kez yayımlanan uluslararası hakemli bir dergidir.
Yazıların sorumluluğu, yazarlarına aittir.

Journal of Limitless Education and Research(J-LERA) is an international refereed journal published three times a year.
The responsibility lies with the authors of papers.

Kapak: Doç. Dr. Ayşe Derya IŞIK-Doç. Dr. Barış ÇUKURBAŞI

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

İNDEKSLER / INDEXED IN

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

Bu Sayının Hakemleri (Referees of This Issue)

Prof. Dr. A. Faruk LEVENT, Marmara Üniversitesi

Prof. Dr. Arda ARIKAN, Akdeniz Üniversitesi

Prof. Dr. Ezgi GÜVEN YILDIRIM, Gazi Üniversitesi

Prof. Dr. İlker CIRIK, Mimar Sinan Güzel Sanatlar Üniversitesi

Prof. Dr. İlknur SAVAŞKAN, Bursa Uludağ Üniversitesi

Prof. Dr. Ozan ŞENKAL, Çukurova Üniversitesi

Prof. Dr. Turan PAKER, Pamukkale Üniversitesi

Doç. Dr. Birsel AYBEK, Çukurova Üniversitesi

Doç. Dr. Buket TURHAN TÜRKKAN, Çukurova Üniversitesi

Doç. Dr. Deniz ATAL, Ankara Üniversitesi

Doç. Dr. Duygu GÜR ERDOĞAN, Sakarya Üniversitesi

Doç. Dr. Emine Nur ÜNVEREN BİLGİÇ, Düzce Üniversitesi

Doç. Dr. Hüsniye DURMAZ, Trakya Üniversitesi

Doç. Dr. İbrahim Halil YURDAKAL, Pamukkale Üniversitesi

Doç. Dr. Remzi YILDIRIM, Kırklareli Üniversitesi

Doç. Dr. Sevilay YILDIZ, Bolu Abant İzzet Baysal Üniversitesi

Dr. Fadime MENGİ US, Milli Eğitim Bakanlığı

Dr. Öğr. Üyesi Ahmet ÜNAL, Kastamonu Üniversitesi

Dr. Öğr. Üyesi Yasemin KARSANTIK, Trabzon Üniversitesi

Öğr. Gör. Dr. Yeşim SÜRMELİOĞLU, Kastamonu Üniversitesi

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

Dear Readers,

Our journal has entered its tenth year of publication with the March 2025 issue. The aim of our journal, the Limitless Education and Research Association (SEAD), has continuously been published since 2016 is to contribute to the field of education and research with new scientific studies. To this end, theoretical and experimental original research, review articles, thesis summaries, and other scientific works are published for free and shared with readers at both nationwide and worldwide.

The Unlimited Education and Research Journal (SEAD) is published three times a year in both Turkish and English. As an international peer-reviewed journal, it is prepared with the scientific endeavors, contributions, and support of academics, scholars, researchers, educators, and teachers from different countries. Each issue including current and new studies is meticulously presented to the readers in the field, following thorough reviews.

Maintaining its academic and scientific quality for ten (10) years, the Limitless Education and Research Journal (SEAD) is indexed in the EBSCO, Education Full Text (H.W. Wilson) Database Coverage List, which is recognized by the Council of Higher Education (ÜAK). It is also indexed in various national and international databases such as ASOS, DRJI, ESJI, OAJI, ROAD, SIS, SOBİAD, and Worldcat, and receives a significant number of citations. According to the SOBİAD impact factor, our journal ranks highly among scientific journals in our country. Efforts to have our journal indexed in more extensive national and international databases are ongoing.

In the March 2025 issue of our journal, seven (7) scientific research and review articles are featured. We would like to thank all the editors, authors, reviewers, and translators who contributed to the preparation and publication of this issue. With the hope that our journal will bring contributions to scientists, researchers, educators, teachers, and students in the field, we extend our best regards.

LIMITLESS EDUCATION AND RESEARCH ASSOCIATION

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

Değerli Okuyucular,

Dergimiz, Mart 2025 sayısı ile yayın hayatında onuncu yılına girmiş bulunmaktadır. Sınırsız Eğitim ve Araştırma Derneği (SEAD) tarafından 2016 yılından bu yana 10 yıldır kesintisiz olarak yayınlanan Dergimizin amacı, yeni bilimsel çalışmalarla eğitim ve araştırma alanına katkı sağlamaktır. Bu amaçla kuramsal ve deneysel özgün araştırmalar, derleme makaleler, tez özetleri ve diğer bilimsel çalışmalar ücretsiz yayınlanmakta, ulusal ve uluslararası düzeydeki okuyucularla paylaşılmaktadır.

Sınırsız Eğitim ve Araştırma Dergisi (SEAD), yılda üç sayı olarak Türkçe ve İngilizce yayınlanmaktadır. Uluslararası hakemli dergi olarak farklı ülkelerdeki akademisyen, bilim insanı, araştırmacı, eğitimci ve öğretmen yazarların bilimsel çaba, katkı ve destekleriyle hazırlanmaktadır. Her sayıda titiz incelemeler sonucu güncel ve yeni çalışmalar alandaki okuyuculara sunulmaktadır.

Akademik ve bilimsel kalitesinden ödün vermeden on (10) yıldır yayın hayatını sürdüren Sınırsız Eğitim ve Araştırma Dergisi (SEAD), ÜAK tarafından alan indeksi olarak kabul edilen EBSCO, Education Full Text (H.W. Wilson) Database Covarage List'te taranmaktadır. Ayrıca ASOS, DRJI, ESJI, OAJI, ROAD, SIS, SOBİAD, Worldcat gibi ulusal ve uluslararası çeşitli indekslerde taranmakta ve çok sayıda atıf almaktadır. SOBİAD etki faktörüne göre Dergimiz, ülkemizdeki bilimsel dergiler içinde önemli bir sırada bulunmaktadır. Dergimizin daha geniş ulusal ve uluslararası indekslerde taranması için girişim ve çalışmalarımız devam etmektedir.

Dergimizin Mart 2025 sayısında yedi (7) bilimsel araştırma ve derleme makaleye yer verilmiştir. Bu sayının hazırlanması ve yayınlanmasında emeği geçen bütün editör, yazar, hakem ve çevirmenlere teşekkür ediyoruz. Dergimizin alandaki bilim insanı, araştırmacı, eğitimci, öğretmen ve öğrencilere katkılar getirmesi dileğiyle, saygılar sunuyoruz.

SINIRSIZ EĞİTİM VE ARAŞTIRMA DERGİSİ

The Journal of Limitless Education and Research, Volume 10, Issue 1

Sınırsız Eğitim ve Araştırma Dergisi, Cilt 10, Sayı 1

TABLE OF CONTENTS

İÇİNDEKİLER

Article Type: Review
Makale Türü: Derleme

Article Type: Research
Makale Türü: Araştırma

The Journal of Limitless Education and Research
Volume 10, Issue 1, 34 - 55

https://doi.org/10.29250/sead.1551766

Received: 17.09.2024 **Article Type:** Research **Accepted:** 10.12.2024

Content Analysis of Studies on Formative Assessment

Eyüphan BAHADIR, Atatürk University, eyuphanbahadir@gmail.com, 0000-0002-2381-1012

Assoc. Prof. Dr. Ceyhun OZAN, Atatürk University, ozanceyhun@atauni.edu.tr, 0000-0002-1415-7258

Abstract: This study aims to examine the studies published in different databases for formative assessment studies withthe descriptive content analysis method, to see the studies conducted in the field as a whole, and to guide researchers who will conduct studies in the future. She obtained studies on formative assessment by using different databases as data sources. We reached 60 studies with different variables for formative assessment using YÖK THESIS, Ulakbim, and Google Scholar databases. Study Classification Form was used to analyse the data obtained. We observed that the number of studies published on formative assessment has increased in recent years. We observed that teachers and secondary school students constituted the primary sample group in the studies, and they used the interview form and achievement test as data collection tools. Content analysis came first in the data analysis technique used in the studies. It is clear that formative assessment is a dynamic and evolving field that holds great potential for improving educational outcomes.

Keywords: Formative assessment, Content analysis, Measurement and evaluation.

Cited in: Bahadır, E. & Ozan, C. (2025). Content analysis of studies on formative assessment. *The Journal of Limitless Education and Research, 10*(1), 34-55. https://doi.org/10.29250/sead.1551766

1. Introduction

Educational assessment plays a vital role in the quality of student learning experiences, teacher instructional activities, and evaluation of curriculum, school quality, and system performance. Assessments act as a lever for both formative improvement of teaching and learning and summative accountability evaluation of teachers, schools, and administration (Brown, 2022). The purpose of assessment is to support learning and to be an integral part of instruction. Assessment supports the development of students in the learning and teaching process (Betts, 2012). Teachers allow students to be informed about what they can do in the light of the information they obtain during the evaluation process. With the findings obtained from the assessment, we can determine whether the course has achieved the target outcomes (Snowman & McCown, 2015). We can use it in different ways depending on the assessment purpose.

According to their purpose, Cauley and McMillan (2010) divided assessments made during the education process into three groups: diagnostic assessment, formative assessment, and summative assessment. We can define diagnostic assessment as placing students in the appropriate program or class based on exams at the beginning of the semester. At this point, the primary purpose is to get to know the student. The aim is to determine the characteristics of the student and place them in the appropriate program rather than evaluating the findings obtained during the evaluation process as grades (Tatar et al., 2014). Also, diagnostic evaluation provides information about the student's potential before entering the program (Popham, 2003).

Glickman et al. (2001) define summative assessment as an evaluation that examines students' achievements at the end of the learning process. It aims to measure students' knowledge, abilities, skills, and attitudes at certain stages of the learning process. In level-determining evaluation, the instructor gives the student a numerical grade or letter after the instruction (Snowman & McCown, 2015). The primary purpose of summative assessment is to provide clear and meaningful data to relevant people about how well students have achieved the target objectives of a course (Snowman & McCown, 2015). Educators make a summative assessment at the end of a course or unit. They use grades to document learning outcomes and determine how much target outcomes have been achieved for the learning process (Miller et al., 2012).

Formative assessment has recently become essential to the learning and teaching process. It emerged to prevent students from being given grades during or at the end of the

learning-teaching process. The purpose of formative assessment is not to assign a grade to the student (Çakmak, 2017). The primary purpose of formative assessment is to monitor the student's progress by monitoring the learning process. Formative assessment allows giving feedback to learners and teachers about the learning process and learning situations (Ozan, 2019). Feedback provided during the learning process ensures that the process continues more effectively (Black & Wiliam, 2009). Black and Wiliam (1998) prefer formative assessment for achieving efficient learning by combining the learning-teaching and evaluation processes. Formative assessment is effective in enhancing the learning process. Assessment, an integral part of the learning process, is used to improve the learning process (Berry, 2008). Formative evaluation also helps to eliminate and improve the mistakes made by students during the learning process by revealing them (Wiliam, 2011). Formative assessment also motivates students in the learning process rather than giving grades to the student (Sadler, 1989). Feedback should be used effectively throughout the entire process to help students become aware of the mistakes they made during the learning process (Gipps, 1994).

Feedback is one of the most essential elements of formative assessment in the learning and teaching process. Besides the feedback element, there are four key elements of formative assessment. Black et al. (2003) divide these items into asking questions, providing feedback regarding the learning process, students' self- and peer-evaluation, and the formative use of summative exams. We can define feedback as information provided to the student during the learning process (Wiliam, 2013). According to another definition, Black and Wiliam (1998) also define it as information provided to an individual who takes anyaction about his action. The essential element of formative assessment, feedback, helps students realize whether there is a difference between the goals they desire to achieve and their existing knowledge and skills. It also provides guidance services for the desired achievements (Ramaprasad, 1983).

Effective feedback used in the learning process should have the following features: It aims to achieve goals along with evaluation criteria, the student must actively participate in every stage of using the feedback element, it should specifically increase students' self-efficacy perceptions and self-regulation skills, timing should be taken into consideration, individual differences of students should be taken into account, it should be used actively by the student and lead to behavioral change (Brookhart, 2013).

Another essential element of formative assessment is questioning (Hodgson & Pyle, 2010). During the learning process, we can ask questions in four different ways. It can be for the

whole class, a small group, an individual, or memorization. Questions posed appropriately in the classroom environment encourage students to think critically, engage in discussions, conduct research, and solve problems. To achieve this, questions should be clear and easily understood by all students, ensuring alignment with the teaching objectives. Additionally, it is essential to frame questions in a way that is comprehensible to the entire class and address them to all students rather than targeting specific individuals (Andrade & Brookhart, 2020). Providing students with adequate time to respond is another crucial factor, as it allows them to process their thoughts and articulate meaningful answers. Teachers should also offer constructive feedback to students' responses, fostering a supportive and engaging learning environment. Moreover, avoiding closed-ended questions and asking questions in a logical and appropriate sequence helps promote deeper thinking and sustained engagement in classroom discussions (Moss & Brookhart, 2009).

In environments where the teaching process is planned by considering all these features, students share their thoughts freely and express them clearly without fear of making mistakes (Sakarya Tapan, 2001). Teachers should encourage students to take an active role in all stages of their learning process by supporting them in classroom environments where formative assessment practices are actively applied. Such an approach not only fosters a deeper understanding and engagement but also nurtures students' confidence and autonomy, ultimately contributing to a more effective and inclusive learning experience (Ozan, 2019).

Another element of formative assessment is self and peer assessment. When self and peer assessment is used effectively in theclassroom environment, students activate the learning process by giving constructive feedback to themselves and their friends(Andrade et al., 2015). Self-assessment is when students criticize themselves according to clearly stated criteria per the goals specified in the learning process (Andrade & Valtcheva, 2009). Self-assessment is an essential strategy of formative assessment in that it gives feedback on what students should do according to current standards and criteria (Crooks, 2007). The self-assessment element is vital for students directly participating in formative assessment activities. Peer assessment or peer feedback is defined as students' interpretation of the work done by their other friends. Peer evaluation has become an essentialelement in environments where the active participation of the entire class in the learning process is essential (Kollar & Fischer, 2010).

Another critical element of formative assessment practice is sharing success criteria and learning objectives with students. Considering the active participation of students in the learning

process, it has been deemed necessary for the student in terms of what should be known in the process and what behaviors are expected (Heritage, 2010). Sharing learning goals, needs, and success criteria with students when entering a new subject is vital in achieving the desired learning outcomes (Gioka, 2007). From the beginning of the learning process, students are responsible for learning, creating their knowledge, collaborating with peers, and progressing towards more complex knowledge sets by creating schemas (Ritchhart et al., 2011).

Assessment is integral to education as it supports learning, informs both teachers and students, ensures course alignment, and enhances the learning process through feedback, questioning, self and peer assessment, and transparency in goal setting. Formative assessment, in particular, has emerged as a powerful tool for improving the overall quality of education by focusing on the continuous improvement of learning experiences.

Previous reviews have extensively explored formative assessment from various perspectives. For instance, Bennett (2011) critically examined the conceptual foundations of formative assessment and its challenges in practical applications. Morris et al. (2021) conducted a systematic review of formative assessment practices in higher education, highlighting their impact on feedback and learning outcomes. Schildkamp et al. (2020) focused on the teacher competencies required for effective formative assessment implementation in classrooms, while Lee et al. (2020) reviewed its effectiveness in K-12 education, identifying key features that enhance its impact. Allal and Mottier-Lopez (2005) provided insights into formative assessment practices within French-language contexts, and Dunn and Mulvenon (2019) raised concerns regarding the limited empirical evidence supporting the impact of formative assessments in education. Yan et al. (2021) explored factors influencing teachers' intentions and implementations of formative assessment, providing a nuanced understanding of its adoption.

Unlike these studies, this research employs a descriptive content analysis approach to identify trends in the literature on formative assessment. By synthesizing findings across various contexts, this study aims to provide a broader perspective that highlights emerging themes, gaps, and directions for future research. This contribution is particularly valuable for researchers seeking to navigate the evolving landscape of formative assessment and design more targeted and impactful studies.

1.1. Purpose of the Research

This study aims to present the studies by examining the national studies and theses on formative assessment practices with the descriptive content analysis method. Based on the

studies conducted on formative assessment, it is to give suggestions to people who will work in this field. It also aims to determine how formative assessment practices are used in education.

1.2. Research Questions

1. What are the publication dates of studies published in the field of education regarding formative assessment?

2. Widely used in studies on formative assessment in the field of education;

a. Sample/study group

b. Sample size

c. Research design

d. Data collection tools

e. Types of data analysis

f. Variables

g. Results

h. Recommendations variables are discussed.

2. Method

In this study, the descriptive content analysis method was employed. Content analysis is a research method that involves systematically analyzing textual or visual data to identify patterns, themes, or trends. While content analysis can be used to examine a variety of data types, a systematic review is a more structured approach that aims to synthesize findings from multiple studies using specific criteria and protocols to assess the quality and relevance of the included research. A systematic review goes beyond summarizing studies to provide a critical analysis of the body of literature, often answering specific research questions based on the quality and findings of those studies (Ültay et al., 2021).

In contrast, descriptive content analysis, as used in this study, focuses on presenting trends and study results in an easily understandable way, by examining the studies within a particular subject area without in-depth quality assessment. This method aims to provide an overview of the key trends in the literature, highlighting patterns and developments in the field, rather than critically analyzing the studies themselves. The goal of descriptive content analysis is to help future researchers easily identify existing trends in the literature, providing a broad

overview that aids in understanding the evolution of the field (Çalık & Sözbilir, 2014; Selçuk et al., 2014).

2.1. Data Sources

We collected data from theses and articles on formative assessment in the national field. The data that formed the basis of our sources were obtained through electronic databases such as Ulakbim, Google Scholar, YÖK Tez, and Dergipark. The keywords used when searching databases were "formative assessment", “assessment for learning” and "formative" words. In accordance with the PRISMA guidelines, we followed a clear and systematic approach to identify, include, and exclude studies, which is outlined below.

2.2. Study Selection Process

The selection of studies for inclusion in this study followed a predefined set of inclusion and exclusion criteria. The following criteria were applied during the study selection process:

Inclusion Criteria:

1. Studies must be published between 2009 and 2022.

2. Studies must focus on formative assessment within the context of Türkiye.

3. Studies must be either master's or doctoral theses or articles published in peer-reviewed scientific journals.

4. Studies must be accessible through databases such as YÖK National Thesis Center, Ulakbim, Google Scholar, and Dergipark.

Exclusion Criteria:

1. Studies published outside the specified period (2009-2022).

2. Studies not directly related to formative assessment or that focus on other forms of assessment.

3. Studies not available in full text or in peer-reviewed journals.

4. Studies conducted outside the national context of Türkiye.

After applying these inclusion and exclusion criteria, a total of 60 studies were identified, which were included in the analysis. These studies were categorized as follows: 36 master's theses, 12 PhD dissertations, and 12 articles published in peer-reviewed journals.

2.3. Data Collection Tool

Study Classification Form was used to classify the studies obtained. The study Classification Form was developed by Sözbilir and Kutu (2008) and revised by Ozan and Köse (2014). There are five primary sections in the revised Study Classification Form: Identity of the study, research design/method, data collection tools, sample, and data analysis methods.

2.4. Data Analysis

In this study, we utilized both descriptive and content analysis methods to analyze the data. Descriptive analysis was employed to organize and summarize data related to variables such as the sample/study group, sample size, research design, data collection tools, and types of data analysis. Descriptive analysis is often used to provide a straightforward account of the characteristics of the data (Berg, 2001; Tesch, 1990). By using pre-existing forms, we were able to categorize and quantify these variables systematically.

On the other hand, content analysis was applied to identify and classify topics and categories related to the results and recommendations presented in the studies. Content analysis is a widely used method for analyzing textual data, allowing for the identification of recurring themes or patterns within the content (Hsieh & Shannon, 2005; Krippendorff, 2004). This method is particularly useful when the goal is to interpret and categorize qualitative data in a meaningful way. By employing content analysis, we could gain insights into the trends and patterns of formative assessment research and categorize them into coherent themes.

To ensure the validity of the findings, we followed established guidelines for content analysis, which involved conducting multiple readings of the selected studies and discussing the findings with fellow researchers to reach a consensus on the categorization process (Elo & Kyngäs, 2008). We also ensured reliability by maintaining consistency in the coding process. Two independent researchers initially coded a subset of the data. Discrepancies in coding were resolved through discussions and recalibration, ensuring inter-coder reliability (Cohen, 1960). This process helped to reduce subjectivity and increase the trustworthiness of the study's results.

3. Results

We examined 60 studies that were published on formative assessment. The distribution of studies by years is shown as a line chart in Figure 1.

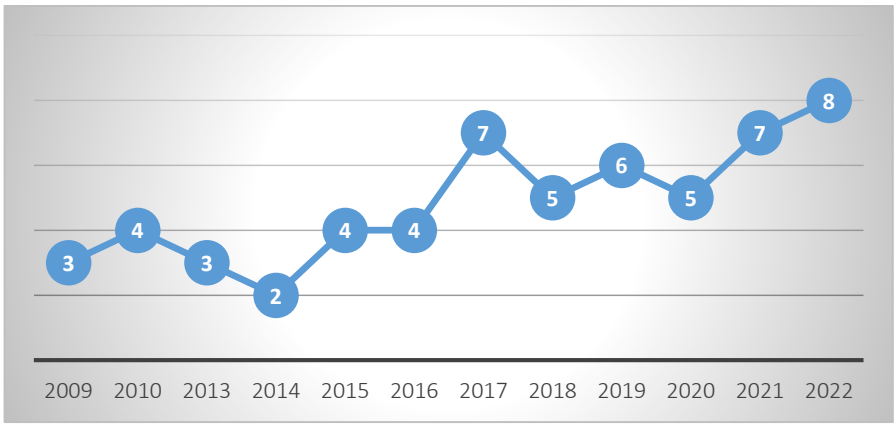

Figure 1. Distribution of academic studies by years

When the distribution of the studies conducted by years is examined, it is seen that there is an increasing trend in the number of studies in recent years. Looking at the distribution by years, it is seen that the most work was done in 2022. After 2022, 2021 and 2017 follow. The year in which the least amount of work was done was 2014. Findings regarding the method and design used in published studies are given in Table 1.

Table 1.

Method/design of studies

Method	Design	f
Quantitative Experimental	Quasi-Experimental Design	17
	Pre-Experimental Design	6
	True-Experimental Design	3
Quantitative Non-Experimental	Comperative	4
	Descriptive/Survey	6
Qualitative	Case study	5
	Action research	4
	Phenomenology	4
	Document review	3
Mixed	Explanatory	3
	Exploratory	3
	Triangulation	2

Quantitative methods were used in 36 of the studies, while 16 studies utilized qualitative methods, and 8 studies employed mixed methods. Among these, 17 studies employed a quasi-experimental design. Furthermore, it was ascertained that 6 studies adopted a descriptive/survey approach, 6 utilized a weak experimental design, 5 conducted case studies,

and 4 engaged in action research. Details regarding the sample groups in the studies are provided in Table 2.

Table 2.

Sample groups of studies

Sample/data source	f
Secondary school students	16
Teachers	16
Teacher candidates	13
University students	11
Primary school students	4

Researchers conducted 16 studies with secondary school students, 16 with teachers, 13 with teacher candidates, and 11 with university students. Information regarding the sample sizes of these studies can be found in Table 3.

Table 3.

Sample sizes of studies

Sample Size	f
1-10	13
11-30	14
31-100	23
101-300	6
301-1000	4

According to sample sizes, 13 studies were published between 1-10, 14 studies were published between 11-30, 23 studies were published between 31-100, 7 studies were published between 101-300, and 4 studies were published between 301-1000. Findings regarding the data collection techniques of the studies are given in Table 4.

Table 4.

Data collection tools of studies

Data Collection Tools	f
Interview form	26
Achievement test	20
Scale	17
Questionnaire	8
Observation form	5
Documents	5
Journals	5
Textbook	4

Interview forms were used in 26 studies, achievement tests in 20, scales in 17, questionnaires in 8, and observation forms, documents, and journals in 5. Findings regarding the data analysis techniques of the studies are given in Table 5.

Table 5.

Data analysis techniques of studies

Data Analysis Techniques		f
Quantitative-Descriptive	Frequency	14
	Mean	12
	Standard deviation	8
Quantitative-Predictive	Non-parametric tests	12
	t-test	11
	Anova	4
	Factor analysis	4
	Correlation	2
Qualitative	Content analysis	27
	Descriptive analysis	9

Content analysis was used in 27 studies, frequency in 14, mean and non-parametric tests in 12, t-test in 11, and descriptive analysis in 9. Data on the variables examined in the studies are given in Table 6.

Table 6.

Variables examined in studies

Variables Examined in Studies	f
Teacher opinions and perceptions	13
Learning	9
Speaking, language, written expression skills	9
Achievement	7
Assessment preferences	7
Attitude	6
Course participation	5
Motivation	4
Exam anxiety	3
Awareness	2
Self-regulation skills	2
Metacognition	2
Learner autonomy	1
Transfer of learning	1

According to Table 8, teacher opinions and perceptions were examined in 13 studies, learning in 9 studies, speaking, language, and written expression skills in 9 studies, success in 7 studies, evaluation preferences in 7 studies, attitude in 6 studies, class participation in 5 studies, and motivation in 4 studies. The findings of the results of the studies are given in Table 7.

Table 7.

Results of studies

Results of Studies	f
Positive attitude towards the course	18
Makes learning easier	12
Language learning/productive language skills development	9
Increases academic achievement	8
Conceptual understanding levels	7
Identifying and eliminating misconceptions	7
Creating a positive classroom climate	6
Pedagogical perception development of teachers	6
Contribution of feedback to learning	5
Metacognition development	5
Reduces learning anxiety	5
Awareness	4
Increases motivation/interest	4
Self-efficacy perception development	3
Development of self-regulation skills	2
Retention	2
Creativity	1

According to Table 7, a positive attitude towards the course (f=18), making it easier to learn (f=12), having a positive attitude towards the course (f=10), language learning and productive language skills (f=9), increasing academic success (f=8), increasing conceptual understanding levels (f=7), identifying and eliminating conceptual misconceptions (f=7), creating a positive classroom climate (f=6), developing teachers' pedagogical perception (f=6) and the contribution of feedback (f=5) are the most common results. The findings of the recommendations included in the studies are given in Table 8.

Table 8.

Recommendations of studies

Recommendations	f
Studies should be conducted on different groups.	17
Its use should be expanded in different branches.	15
Different variables and scales should be used.	14
Teachers should be given in-service training.	12
More detailed, multi-dimensional studies should be carried out.	11
Ministry of Education should revise the programs.	11
University programs should be reviewed.	9
Objective numbers should be simplified.	8
The number of studies should be increased.	8
The feedback element should be included at all stages of teaching.	8
Evaluation should be multi-dimensional.	8
Content should be enriched.	6
Cooperation should be established between family and school.	5
Joint work should be done on reading, language, and expression skills.	4

According to Table 10, studies should be conducted in different groups and age levels (f = 17), formative assessment practices should be disseminated in all branches (f = 15), different variables and scales should be used than the studies conducted (f = 14), and in-service training should be provided for teachers. (f= 12), more detailed studies should be conducted (f= 11), and the Ministry of National Education and universities should create programs that include formative assessment practices and activities.

4. Discussion and Conclusion

In this study, studies published in various databases on formative assessment in Türkiye between 2009 and 2022 were discussed regarding various variables. The variables discussed in the published studies were examined according to the variables: year of publication, sample group, sample size, data collection techniques, data analysis methods, variables considered, results of the studies, and recommendations.

The distribution of studies by publication year between 2009 and 2022 is relatively balanced, with an observed increase in recent years. It is essential to continue monitoring and analyzing the trends in formative assessment research over time to keep abreast of emerging themes and developments. The results of Morris et al. (2021) indicate that research examining the impact of formative assessment in higher education has increased over time. Notably, there was a significant rise in studies conducted during the period from 2011 to 2015.

36 studies relied predominantly on quantitative research methods, indicating a strong emphasis on numerical data and statistical analysis in assessing formative assessment. This suggests that much of the research in this area seeks to measure the effectiveness or impact of formative assessment in a controlled, quantifiable manner. In addition, eight studies used mixed methods, while 16 studies employed qualitative research methods. The inclusion of mixed methods highlights the value of both numerical and narrative data, offering a more comprehensive understanding of formative assessment practices and outcomes. The qualitative studies, on the other hand, provide deeper insights into the experiences, perceptions, and contextual factors influencing formative assessment, suggesting that these aspects are critical to fully understanding its role in education.

Seventeen of the studies used a quasi-experimental design, which allowed researchers to investigate cause-and-effect relationships in real-life settings. This focus on quasi-experimental designs reflects a desire to explore how formative assessment interventions can lead to changes in student learning outcomes in naturalistic settings, enhancing the practical

applicability of the findings. The variety of research designs, with six studies employing a descriptive/survey approach, also indicates an interest in collecting and analyzing data to describe phenomena. This suggests that a portion of the research aims to create a broad understanding of formative assessment practices without necessarily establishing causal relationships, providing valuable context for further experimental studies.

Six studies implemented a weak experimental design, five conducted case studies, and four engaged in action research. Furthermore, the investigation of formative assessment was approached through a variety of research methods. In the systematic evaluation conducted by Yan et al. (2021), it was determined that the qualitative approach was most frequently preferred in the research design. These findings demonstrate the diverse nature of research on formative assessment, with researchers using various approaches and designs to investigate different aspects of this educational practice. This diversity in research methods and designs contributes to a more comprehensive understanding of formative assessment and its impact on teaching and learning. Researchers in this field should continue to embrace a range of methodologies to gain deeper insights into the complexities of formative assessment in educational contexts.

The studies mostly included secondary school students, teachers, teacher candidates, and university students as samples. This aligns with the systematic review by Yan et al. (2021), which also indicates that most study samples in formative assessment research tend to come from primary or secondary/high schools. This trend may reflect the significant attention given to formative assessment in K-12 education, particularly as a tool for improving teaching and learning in these settings. However, the focus on higher education contexts, such as university students and teacher candidates, may provide valuable insights into how formative assessment strategies can be adapted to different educational stages and learner needs. Expanding the sample scope across various educational levels could offer a more comprehensive understanding of the broader impacts of formative assessment across different contexts.

When examining the sample size variable in published studies, those with a sample size between 31-100 are the most common. Morris et al.'s (2021) systematic review on the impact of formative assessment in higher education revealed a significant limitation in the studies they analyzed. Out of 188 studies reviewed, 126 relied on very small sample sizes, often confined to a single department or a single instructor within an institution. This finding highlights a critical issue in the generalizability and robustness of the evidence base, emphasizing the need for studies with larger, more diverse samples to better understand the broader implications of formative

assessment practices in higher education contexts. The presented findings demonstrate a diversity in sample sizes used in formative assessment research. This reflects the varying research objectives and contexts within which formative assessment is studied. Researchers' choices in sample sizes align with the specific research questions they aim to address and the level of generalizability they seek to achieve or are constrained by their inability to reach larger sample sizes.

Interview forms, achievement tests, and scales were mostly used in the studies. Content analysis is the most frequently used method for data analysis in the examined studies. According to Yan et al.'s (2021) systematic review of formative assessment, the three most common data collection methods were interview, survey, and classroom observation. This highlights the methodological diversity in formative assessment research, as researchers choose analysis methods based on their research questions and data nature. The selection of a data analysis method has a significant impact on the depth and rigour of research findings. Therefore, researchers must carefully evaluate the suitability of these methods for their research objectives, data types, and research designs to ensure the validity and reliability of their analyses.

When analysing the studies based on the discussed variables, it was found that teacher opinions and perceptions were the most prominent. Subsequently, the study identified the positive impact of formative assessment on learning, with productive language and speaking skills ranking third. According to the systematic review by Yan et al. (2021), in terms of the total number, the studies were reasonably balanced in the research; there were 26 studies for factors related to teacher intention, 47 studies for factors related to teacher implementation, and 21 studies investigating both. In a systematic review conducted by Schildkamp et al. (2020), the formative assessment literature was examined to identify prerequisites for the effective use of formative assessment by teachers. The results show that (1) knowledge and skills (e.g., data literacy), (2), psychological factors (e.g., social pressure), and (3) social factors (e.g., collaboration) influence the use of formative assessment. These findings demonstrate the wide range of variables examined in formative assessment research, emphasizing the multidimensional nature of this educational practice. Researchers and educators can use these insights to customize formative assessment strategies and interventions for specific variables of interest and educational contexts, thereby improving the effectiveness of formative assessment practices.

The findings indicate that the most common outcomes of formative assessment include fostering a positive attitude towards the course and facilitating learning. These results highlight the importance of formative assessment as a tool to enhance students' motivation and support learning processes. Additionally, other significant outcomes, such as developing a positive attitude towards the course, improving language learning and productive language skills, increasing academic achievement, enhancing conceptual understanding, and identifying and addressing conceptual misconceptions, demonstrate its impact on students' cognitive development. Furthermore, creating a positive classroom climate, improving teachers' pedagogical perceptions, and the contribution of feedback emphasize the pedagogical and social benefits of formative assessment for both students and teachers. These findings collectively suggest that formative assessment is not only a means to improve academic success but also a multifaceted tool that enhances the overall quality of teaching and learning processes.

The findings of Lee et al.'s systematic review underscore that formative assessment interventions generally have a small but positive effect on student learning, particularly in mathematics, literacy, and arts. These results align with previous research suggesting the potential of formative assessment to enhance learning outcomes, though the magnitude of the impact remains modest. Importantly, the meta-regression analyses highlighted critical features that amplify the effectiveness of formative assessments. Specifically, interventions that promote student-initiated self-assessment, provide formal formative assessment evidence such as written feedback on quizzes and operate on a medium-cycle length (within or between instructional units; demonstrated more substantial benefits. These findings suggest that tailoring formative assessment practices to include structured feedback and fostering students' active participation in their learning process can significantly enhance their effectiveness, particularly in specific subject areas.

The study conducted by Bennett (2011), which critically reviews meta-analyses on formative assessment, reveals that while formative assessment practices can facilitate learning, the benefits may vary significantly depending on specific implementations and student subgroups. Bennett highlighted that the often-cited claim of formative assessment increasing student test performance by 0.4 to 0.7 standard deviations is, in fact, a myth without a reliable empirical foundation. These findings advocate for a more cautious approach to the efficacy claims made by proponents of formative assessment, emphasizing that measurable benefits may differ based on specific practices and contexts. The critical review conducted by Dunn and

Mulvenon (2009) reached similar conclusions, highlighting the limitations of empirical evidence supporting Black and Wiliam's (1998) claims that formative assessment enhances student achievement. Many of the eight articles included in Black and Wiliam's analysis were methodologically flawed, making it difficult to generalize their findings. For instance, the meta-analysis by Fuchs and Fuchs (1986) largely relied on data from students with disabilities, with 80% of the studies deemed methodologically unsound. Furthermore, there has been a limited number of recent studies examining the impact of formative assessment in traditional classrooms. Although research on technology-supported formative assessment is more prevalent, these studies also face methodological challenges such as self-selection bias and small effect sizes.

According to the recommendations in published research, studies should be conducted primarily in different age groups and grade levels. Secondly and thirdly, formative assessment studies should be carried out in all subject areas according to different scales and variables. It also underscores the need for an inclusive approach to teacher education, including interdisciplinary practice and diverse educational contexts. According to the findings of Bennett's (2011) critical review study, it is crucial to acknowledge that the impact of formative assessment can be constrained by the content, format, and design of the broader assessment system in which it is embedded, particularly in relation to accountability tests. Ensuring system-level coherence and promoting alignment between formative and summative assessments are essential to fully realizing the transformative potential of formative assessment on learning and teaching. According to the findings of the critical review conducted by Dunn and Mulvenon (2009), research generally indicates that formative assessment can have a positive impact on student achievement. However, more rigorous and well-designed studies are needed to conclusively demonstrate this effect. In particular, further research is required to identify the most effective formative assessment practices for low-performing students.

As a result, this study has provided important information to the literature by examining the studies on formative assessmentconducted in Türkiye between 2009 and 2022 according to their various characteristics. Formative assessment is an ever-changing topic with great potential to improve educational outcomes. Researchers, educators, and policymakers should continue collaborating to investigate different aspects of formative assessment and improve its effectiveness in education. In this context, the following recommendations have been made:

- Many studies analyzed within the scope of this study generally used quantitative

research methods. However, for a better understanding of formative assessment practices, researchers should consider qualitative and mixed research methods. Nonexperimental descriptive research methods have been used frequently, but it is essential also to explore experimental approaches to understand formative assessment more comprehensively.

• Sample sizes in studies generally range from 31 to 100, but studies should be conducted on larger sample sizes toobtain more reliable results. Most studies have focused on teachers and secondary school students, but future research should also focus on different sample groups to increase the generalizability of the results.

• The primary data collection tools used include interviews and achievement tests. However, researchers should alsoconsider using other techniques such as surveys, observational methods, and self-report measures to obtain more information. While content analysis is the most common data analysis method, diversifying quantitative and qualitative analysis techniques may be necessary to understand formative assessment research better.

• Variables such as teacher perceptions, attitudes, and language skills have been frequently examined concerning formative assessment. However, it is essential to investigate broader variables for a more holistic perspective.

• The results indicate that formative assessment has a positive impact on learning. Further research should explore its multifaceted effects on different educational outcomes. Future research should explore formative assessment practices in all subject areas, focusing on different age groups and grade levels. It should also examine studies with different scales and variables to better understand the applicability and effectiveness of formative assessment in various educational contexts.

CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest in this study.

RESEARCH AND PUBLICATION ETHICS STATEMENT

The authors declare that research and publication ethics are followed in this study.

AUTHOR LIABILITY STATEMENT

The authors declare that the "Conceptual Framework, Research, Visualization" part of this study were done by Eyüphan BAHADIR and "Method Design, Research, Post Draft, Visualization, Review and Editing" part of this work was done by Ceyhun OZAN.

REFERENCES/KAYNAKLAR

Allal, L., & Mottier-Lopez, L. (2005). Formative assessment of learning: A review of publications in French. In *Formative assessment: Improving learning in secondary classrooms* (pp. 241-264). OECD Publication.

Andrade, H., Lui, A., Palma, M., & Hefferen, J. (2015). Formative assessment in dance education. *Journal of Dance Education, 15*(2), 47-59, https://doi.org/10.1080/15290824.2015.1004408

Andrade, H., & Valtcheva, A. (2009). Promoting learning and achievement through self-assessment. *Theory into Practice, 48*(1), 12-19. https://doi.org/10.1080/00405840802577544

Andrade, H. L., & Brookhart, S. M. (2020). Classroom assessment as the co-regulation of learning. *Assessment in Education: Principles, Policy & Practice*, *27*(4), 350-372.

Bennett, R. E. (2011). Formative assessment: A critical review. *Assessment in education: principles, policy & practice*, *18*(1), 5-25.

Berg, B. L. (2001). *Qualitative research methods for the social sciences* (4th ed.). Allyn & Bacon.

Berry, J. W. (2008). Globalisation and acculturation. *International Journal of Intercultural Relations*, *32*(4), 328-336. https://doi.org/10.1016/j.ijintrel.2008.04.001

Betts, D. G. (2012). *The role of professional learning communities in developing and using common formative assessments* [Unpublished Phd thesis]. Loyola University.

Black, P., Harrison, C., Lee, C., Marshall, B., & William, D. (2003). *Assessment for learning: Putting it into practice.* Open University Press.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice, 5*(1), 7-74. https://doi.org/10.1080/0969595980050102

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21*(1), 5-31. https://doi.org/10.1007/s11092-008-9068-5

Brookhart, S. M. (2013). *How to create and use rubrics for formative assessment and grading*. ASCD.

Brown, G. T. L. (2022). The past, present and future of educational assessment: A transdisciplinary perspective. *Frontiers in Education, 7*, 1060633. https://doi.org/10.3389/feduc.2022.1060633

Cauley, K. M., & McMillan, J. H. (2010). Formative assessment techniques to support student motivation and achievement. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *83*(1), 1-6. https://doi.org/10.1080/00098650903267784

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20*(1), 37-46.

Crooks, G. E. (2007). Measuring thermodynamic length. *Physical Review Letters*, *99*(10), 1-4. https://doi.org/10.1103/PhysRevLett.99.100602

Çakmak, T. (2017). *İlköğretim 7. sınıf fen ve teknoloji dersi 'vücudumuzdaki sistemler' ünitesinin biçimlendirici değerlendirme yöntemi ile işlenmesinin öğrencilerin kavramsal anlama düzeylerine olan etkisi [The effect of teaching the "systems in our body" unit covered in primary education seventh grade science and technology course through formative assessment method on students' conceptual understanding levels]* (Thesis No. 487361) [Master's thesis, Uludağ University]. Higher Education Council National Thesis Center.

Çalık, M., & Sözbilir, M. (2014). İçerik analizinin parametreleri. *Eğitim ve Bilim*, *39*(174), 33-38. https://doi.org/10.15390/EB.2014.3412

Dunn, K. E., & Mulvenon, S. W. (2019). A critical review of research on formative assessments: The limited scientific evidence of the impact of formative assessments in education. *Practical Assessment, Research, and Evaluation*, *14*, 1-11.

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107–115.

Fuchs, L. S., & Fuchs, D. (1986). Effects of systematic formative evaluation: A meta-analysis. *Exceptional Children, 53*, 199-208.

Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2001). *Supervision and instructional leadership: A developmental approach* (6th ed.). Allyn & Bacon.

Gioka, O. (2007). Assessment for learning in biology lessons. *Journal of Biological Education*, *41*(3), 113-116.

Gipps, C. (1994). Developments in educational assessment: What makes a good test? *Assessment in Education: Principles, Policy & Practice*, *1*(3), 283-292.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277–1288.

Heritage, M. (2010). Formative assessment and next-generation assessment systems: are we losing an opportunity? *Council ofChief State School Officers*.

Hodgson, C., & Pyle, K. (2010). *A literature review of assessment for learning in science*. Nfer.

Kollar, I., & Fischer, F. (2010). Peer assessment as collaborative learning: A cognitive perspective. *Learning and Instruction*, *20*(4), 344-348.

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Sage.

Lee, H., Chung, H. Q., Zhang, Y., Abedi, J., & Warschauer, M. (2020). The effectiveness and features of formative assessment in US K-12 education: A systematic review. *Applied Measurement in Education*, *33*(2), 124-140. https://doi.org/10.1080/08957347.2020.1732383

Miller, T., Jessop, J., Mauthner, M., & Birch, M. (2012). *Ethics in qualitative research*. Sage.

Moss, C. M., & Brookhart, S. (2009). *Advancing formative assessment in every classroom*. ASCD.

Morris, R., Perry, T., & Wardle, L. (2021). Formative assessment and feedback for learning in higher education: A systematic review. *Review of Education*, *9*(3), e3292. https://doi.org/10.1002/rev3.3292

Ozan, C., & Köse, E. (2014). Research trends in curriculum and instruction. *Sakarya University Journal of Education, 4*(1), 116-136. https://doi.org/10.19126/suje.76547

Ozan, C. (2019). Authentic assessment increased academic achievement and attitude towards the educational measurement of prospective teachers. *International Journal of Evaluation and Research in Education*, *8*(2), 299-312.

Popham, W. J. (2003). *Test better, teach better: The instructional role of assessment*. ASCD.

Ramaprasad, A. (1983). On the definition of feedback. *Behavioral Science, 28*(1), 4-13.

Ritchhart, R., Church, M., & Morrison, K. (2011). *Making thinking visible: How to promote engagement, understanding, and independence for all learners*. Jossey-Bass.

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science*, *18*(2), 119-144.

Sakarya Tapan, S. (2001). Entrepreneurial ventures and small business: An assessment of the entrepreneurial roles of the franchisor and the franchisee from an entrepreneurial school of strategy formation perspective. *Journal of Research in Marketing and Entrepreneurship*, *3*(3), 123-138.

Schildkamp, K., van der Kleij, F. M., Heitink, M. C., Kippers, W. B., & Veldkamp, B. P. (2020). Formative assessment: A systematic review of critical teacher prerequisites for classroom practice. *International Journal of Educational Research*, *103*, 101602. https://doi.org/10.1016/j.ijer.2020.101602

Selçuk, Z., Palancı, M., Kandemir, M., & Dündar, H. (2014). Tendencies of the researches published in Education and Science Journal: Content analysis *Education and Science, 39*(173), 430-453.

Snowman, J., & McCown, R. (2015). *Psychology applied to teaching* (14th ed.). Wadsworth Cengage Learning.

Sözbilir, M., & Kutu, H. (2008). Development and current status of science education research in Turkey. *Essays in Education [Special issue]*, 1-22.

Ültay, E., Akyurt, H., & Ültay, N. (2021). Sosyal bilimlerde betimsel içerik analizi. *IBAD Sosyal Bilimler Dergisi*, (10), 188-201.

Tatar, E., Karakuyu, Y., & Tüysüz, C. (2014). Sınıf öğretmeni adaylarının bilimin doğası kavramları: teori, yasa ve hipotez. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *8*(15), 363-370.

Tesch, R. (1990). *Qualitative research: Analysis types and software tools*. Falmer.

Wiliam, D. (2011). What is assessment for learning? *Studies in Educational Evaluation*, *37*(1), 3-14.

Wiliam, D. (2013). How is testing supposed to improve schooling? Some reflections. *Measurement: Interdisciplinary Research and Perspectives*, *11*(1-2), 55-59.

Yan, Z., Li, Z., Panadero, E., Yang, M., Yang, L., & Lao, H. (2021). A systematic review on factors influencing teachers' intentions and implementations regarding formative assessment. *Assessment in Education: Principles, Policy & Practice*, *28*(3), 228-260. https://doi.org/10.1080/0969594X.2021.1884042