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ELEŞTİREL DÜŞÜNMEYİ ENGELLEMEDE EZBERCİ ÖĞRENMENİN ROLÜNÜN İÇERİK ANALİZİ: SİSTEMATİK LİTERATÜR TARAMASI

CONTENT ANALYSİS OF THE ROLE OF ROTE LEARNİNG İN HİNDERİNG CRİTİCAL THİNKİNG: SYSTEMATİC LİTERATURE REVİEW

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ÖZET

Bu sistematik derleme, eleştirel düşünme ve yaratıcılığı engellemede ezberci öğrenmenin rolünü incelemek için 2020 ve 2025 yılları arasında yayınlanmış 68 makaleden elde edilen ampirik kanıtları sentezlemektedir. Çalışma, araştırmaları dergiye, ülkeye, araştırma türüne, yayın yılına, yazarlık kalıplarına ve atıf etkisine göre kategorize etmek için içerik analizini kullanmaktadır. Bulgular, özellikle Amerika Birleşik Devletleri (%26,47) olmak üzere Batılı ülkelere yönelik güçlü bir coğrafi önyargı ile literatür incelemelerinin (%41,2) baskın olduğunu ortaya koymaktadır. Ezberci öğrenme kısa vadeli hafızayı desteklerken, özellikle standart test ortamlarında yaratıcılığı ve problem çözmeyi sıklıkla engellemektedir. Derleme, Afrika ve Latin Amerika gibi yeterince temsil edilmeyen bölgelerdeki araştırmalardaki boşlukları vurgulamakta ve ezberlemeyi yapılandırmacı, uygulamaya dayalı yaklaşımlarla dengeleyen pedagojik reformlara olan ihtiyacın altını çizmektedir. İşbirlikçi araştırmalar yaygındır (%73,5 çok yazarlı çalışma), ancak atıf kalıpları önemli farklılıklar göstermektedir ve çalışmaların azınlığı yüksek görünürlük elde etmektedir. Çalışma, eleştirel düşünme pedagojilerine doğru değişimleri değerlendirmek için çeşitli metodolojilerin ve uzunlamasına araştırmaların savunulması ile sonuçlanmaktadır.

*Anahtar Kelimeler***:** ezberleme, ezberleme, eleştirel düşünme, yaratıcılık, yapılandırmacılık.

ABSTRACT

This systematic review synthesizes empirical evidence from 68 articles published between 2020 and 2025 to explore the role of rote learning in hindering critical thinking and creativity. The study employs content analysis to categorize research by journal, country, research type, publication year, authorship patterns, and citation impact. Findings reveal a predominance of literature reviews (41.2%), with a strong geographical bias toward Western countries, particularly the United States (26.47%). While rote learning aids short-term retention, it often impedes creativity and problem-solving, especially in standardized testing environments. The review highlights gaps in research from underrepresented regions such as Africa and Latin America and underscores the need for pedagogical reforms that balance memorization with constructivist, application-based approaches. Collaborative research is prevalent (73.5% multi-authored studies), yet citation patterns show significant disparities, with a minority of studies receiving high visibility. The study concludes by advocating for diverse methodologies and longitudinal research to assess shifts toward critical-thinking pedagogies.

*Keywords***:** rote learning, memorization, critical thinking, creativity, constructivism.

INTRODUCTİON

Over time, rote learning has shaped the educational landscape, with memorization and repetition remaining prevalent in many educational systems worldwide. Rote learning has been a traditional method of retaining foundational knowledge. There has been much debate in education circles about whether it affects higher-order cognitive skills such as creativity and critical thinking. This systematic review uses theoretical frameworks, previous studies, and contemporary research to examine the relationship between rote learning and creative and critical thinking development.

In constructivist learning theories, Piaget (1954, 1978) described how active engagement, problem-solving, and application of knowledge are essential to creativity and critical thinking (Piaget, 1974, 1978). Rote learning emphasizes stimulus-response mechanisms and reinforces memorization, closely aligning with behaviourist principles (Skinner, 1954). Research shows that rote learning has not improved cognitive flexibility or deeper understanding (Biggs, 1996; Entwistle, 2000). According to Wong and Wong (2002), students who rely heavily on rote memorization have difficulty applying knowledge to novel situations, which is essential for critical thinking. Divergent thinking and originality are both required for creative thinking (Runco, 2004). According to several studies, cultural and contextual factors affect rote learning in high-stakes testing environments (Zhao, 2014; Tan, 2017). Rote learning does not correlate directly with creativity, critical thinking, or even reasoning across varied educational settings, as no systematic synthesis of evidence exists to support this claim. Memorization through repetition without deep understanding has been the focus of repetition learning research (Ausubel, 1968). Despite its beneficial effects on foundational knowledge, rote learning hinders creativity and critical thinking by inhibiting deeper cognitive engagement (Mayer, 2002). Constructionists emphasize meaningful learning over rote memorization (Vygotsky, 1978). Rote learning's effects on student cognition have been studied, but the results are mixed. Although rote learning is considered crucial for mastering fundamental concepts before applying critical thinking (Sweller, 1988; Kirschner et al., 2006), others assert that it has limitations when it comes to encouraging creative problem-solving (Jonassen, 1991; Sternberg & Lubart, 1995).

According to recent studies, excessive rote learning may negatively impact cognitive flexibility and innovation, especially in standardized environments (Kember, 2016; Gopnik). In standardized environments, excessive rote learning has negatively impacted cognitive flexibility (Kember, 2016; Gopnik, 2020).

This study aims to review empirical literature about the impacts of rote learning on creativity and critical thinking in the workplace to conduct a systematic review of the literature. Through synthesizing research, it aims to identify patterns, gaps, and the consequences for educational practices as a result. The misuse of rote learning has been widely criticized as hindering higher-order thinking, but it is still practised in many educational systems despite its broader implications. In the school setting, students cannot think critically and creatively as the focus is too much on memorization (Martinon & Säljö, 1976). While some believe rote learning is not beneficial to developing more complex cognitive processes (Sweller, 1988), others believe it provides the foundation for more complex cognitive processes. This is why it is essential to evaluate empirical evidence to reconcile these conflicting perspectives. Curriculum demands and assessment structures often emphasize memorization. This approach appears to increase short-term retention but has unclear effects on critical thinking and creativity (Martin & Säljö, 1976). This study examines how rote learning affects students' critical thinking and innovation ability. Alternative pedagogical methods may mitigate rote learning.

This systematic review aims to establish how these things interact by analyzing the effects of rote learning on creativity and critical thinking. That rote learning affects both of them. This article aims to provide educators and policymakers with a thorough description of what rote learning can do to help them implement it in the most effective way possible for a successful outcome. Moreover, the study will identify gaps in the literature and suggest research directions going forward to support future research in the field. Several systematic reviews have been conducted regarding rote learning and creativity to help compare and synthesize the findings from these studies. We plan to do so in this

systematic review. Specifically, this study aims to accomplish the following objectives as a result of its findings:

- Examine the theoretical perspectives and empirical evidence linked to rote learning's benefits for cognitive development.
- Examine the pros and cons of fostering critical thinking and creativity.
- Examine other teaching strategies that balance rote memorization with deeper cognitive processes.

The study aims to analyze the articles published between 2020 and May 2025 (n=69) on the role of Rote Learning in hindering Creativity and Critical Thinking and prepare the ground for future research.

This study examines the following questions regarding Rote Learning:

1. What is the dissemination of the articles according to journals?
2. What is the dissemination of the articles based on countries?
3. What research types have been employed in the published articles?
4. What is the dissemination of the articles according to the years?
5. What is the dissemination of articles based on the authors' frequency?
6. What is the dissemination of the articles based on citations per author?

METHOD

Content analysis analyses text-based qualitative data in various formats, including newspaper articles, children's books, interview transcripts, and advertising or film scripts. There are two types of content analysis: quantitative and qualitative. The aim of quantitative research, which involves analyzing data from a sample, is to identify and quantify specific words, phrases, or ideas within that sample. In contrast, qualitative research seeks to derive meaning by identifying themes in the sample (Egmir, Erdem, and Kocyigit 2017). This study searched the Scopus database for articles on "Rote learning, Critical thinking, Creativity, Memorization, Constructivism, Barriers to creativity" to include in the content analysis, resulting in 68 articles.

Research Model

According to Neuendorf and Kumar (2015), content analysis is a credible method for assessing both the relevance and scope of a text and its writing style.

Content analysis examines books and written, visual, or verbal communication messages. According to Blooms et al. (1956, in Assaly and Igbaria, 2014), analysis involves comprehending the material's organizational structure. This process includes identifying components, analyzing relationships, and recognizing organizational principles. Learning outcomes from analysis necessitate a deeper understanding of the content and structure of the material.

This study examined 100 studies on "the effect of rote learning on critical thinking and collaboration," which are available in the Scopus database and analyzed through deductive content analysis; however, only 68 of the articles were included following the exclusion process. According to Neuendorf and Kumar (2015), content analysis can be equally valuable and valid as an approach to identifying the content of texts by identifying their scope and proving their value and validity.

Data Collection and Analysis

Loeb et al. (2017) assert that researchers are responsible for transforming raw data into meaningful discoveries presented in a format comprehensible to the specific audiences intended for the data. Data collection for this study was carried out using a table that compiled journal details,

including the years of publication, language, country, number of keywords, authors, research type, and data analysis methods.

During this study, a table was employed to gather information on journals, encompassing their years of publication, publication countries, number of keywords and authors, data collection tools, and types of research. Keywords were analyzed in the abstracts of articles from the Scopus database covering 2020 to 2025. Data collection for this study was accomplished through a table that included details such as the journals in which the articles were published, the publication dates, the language of publication, the country of research, the number of keywords and authors, the type of research, and the methods of analysis. This study utilized a systematic review that involved assessment, research, structured evaluation, categorization, and classification based on previously established evidence (Hariyati, 2010). This approach represents a qualitative descriptive method. Qualitative research encompasses philosophical perspectives, assumptions, and postulates.

It is an approach researchers employ to ensure their work can be analyzed, critiqued, replicated, repeated, and/or modified while selecting suitable methods. Qualitative research pertains to the techniques researchers implement to design and analyze their studies. This study is based on 68 research articles published between 2020 and 2025, indexed in Scopus, which are relevant to the content analysis of the articles.

Study Group

One hundred articles were screened from the Scopus database based on the following criteria: rote learning, critical thinking, creativity, memorization, constructivism, and barriers to creativity, published between 2020 and 2025. Using a sampling method, 68 articles were selected according to these criteria. Scopus was preferred for its size and data quality, being the world's largest and most up-to-date database.

Findings

As a result of searching the web database at the time of search between 2020 and 2025, one hundred articles were found that were relevant to the keywords "Rote Learning", "Critical Thinking", "Creativity", and "Content Analysis". Sixty-eight articles were accessible in this study, and 68 were chosen by random sampling throughout the research process.

To address RQ1, which states: What is the dissemination of the articles according to journals? The researcher presented the results in Table 1.

Table 1. Distribution according to Journal

Journal	Frequency (f)	Percentage (%)
academia.edu	4	5.88%
academic.oup.com	1	1.47%
acjol.org	1	1.47%
ajol.info	1	1.47%
arxiv.org	1	1.47%
books.google.com	1	1.47%
bwjournal.org	1	1.47%
ceeol.com	1	1.47%
cir.nii.ac.jp	1	1.47%
coed.dypvp.edu.in	1	1.47%
cognizancejournal.com	1	1.47%
corescholar.libraries.wright.edu	1	1.47%
degruyter.com	2	2.94%
dergipark.org.tr	2	2.94%
ecommons.aku.edu	1	1.47%
eijbms.com	1	1.47%

ejpbl.org	1	1.47%
Elsevier	3	4.41%
Euclid.id	1	1.47%
frontiersin.org	2	2.94%
frontierspartnerships.org	1	1.47%
ijete.org.pk	1	1.47%
in library.uz	1	1.47%
ir.kiu.ac.ug	2	2.94%
j.vidhyayanaejournal.org	1	1.47%
joeac.com	1	1.47%
journal.uob.edu.pk	1	1.47%
journal-fer.com	1	1.47%
journals.lww.com	2	2.94%
jurnal.ypkpasid.org	1	1.47%
karger.com	1	1.47%
library.atmiya.net	1	1.47%
library.iated.org	1	1.47%
nate.org.uk	1	1.47%
nepjol.info	1	1.47%
papers.ssrn.com	2	2.94%
pdfs.semanticscholar.org	2	2.94%
pure.jgu.edu.in	1	1.47%
researchgate.net	3	4.41%
scholarworks.calstate.edu	1	1.47%
sciendo.com	1	1.47%
search.ebscohost.com	2	2.94%
sjss.isp.edu.pk	1	1.47%
so04.tci-thaijo.org	1	1.47%
so19.tci-thaijo.org	1	1.47%
Springer	3	4.41%
thecrsss.com	2	2.94%
torrossa.com	1	1.47%
Wiley Online Library	2	2.94%
Total	68	100%

Table 1 provides a clear overview of where research on rote learning is published. The traditional academic databases, such as Elsevier and Springer, account for approximately 4.4% of the total content, illustrating their sustained influence, even though they are not the dominant players. There are 48 different publishers on the list, with many appearing only once or twice on the list. The most common type of publishing is social media, with 36.8% of publications appearing only once or twice. According to this data, researchers focus less on a few significant journals and more on many specialized research platforms and platforms rather than only publishing their work in a few key journals.

There is a noticeable presence of academic search engines, such as ResearchGate and academia.edu, at 4.4% and 5.9%, respectively, which is a testament to the fact that many scholars value rapid dissemination through academic networks and formal publication. Also, regional repositories make a significant difference; the Turkish repository dergipark.org.tr and African platforms such as ajol.info and acjol.org demonstrate that this discussion is not exclusive to Western societies.

To address RQ1, which states, "What is the dissemination of articles based on countries?" The researcher presented the results in Table 2 and summarized them in Table 2.

Table 2. Distribution according to Countries

Country	Frequency (f)	Percentage (%)
United States	18	26.47%
United Kingdom	6	8.82%
India	6	8.82%
Germany	5	7.35%
Switzerland	4	5.88%
Netherlands	3	4.41%
Turkey	3	4.41%
Pakistan	3	4.41%
South Africa	2	2.94%
Japan	2	2.94%
Thailand	2	2.94%
Italy	1	1.47%
Poland	1	1.47%
Spain	1	1.47%
Nepal	1	1.47%
Nigeria	1	1.47%
Uganda	1	1.47%
Uzbekistan	1	1.47%
Botswana	1	1.47%
Total	68	100%

Table 2 shows a concentration of research output on rote learning, with almost a quarter (26.47%) of all publications in this field being published in the United States. The United Kingdom and India are the two secondary hubs, each contributing 8.82% of the studies. The European Union as a whole represents a significant portion of the world's affected populations, with Germany (7.35 %), Switzerland (5.88 %), and the Netherlands (4.41%) showing strong engagement with the issue. Most developing nations, such as Turkey, Pakistan, and South Africa, appear in the mid-range of 2.94-4.41%; a diverse group of countries, from Japan to Botswana, suffer from minimal or non-existent representation (1.47%). Research on rote learning is globally relevant, and persistent disparities exist between developed and developing nations. Western countries and India and their associated institutions dominate the academic output, while other regions remain primarily peripheral. This indicates a substantial geographical gap in the literature, as most South American countries and African nations beyond South Africa, Nigeria, Uganda, and Botswana have not been included.

To address RQ1, which states: What research types have been employed in the published articles? The researcher summarized the findings in Table 3.

Table 3. Distribution according to Research type

Research Type	Frequency (f)	Percentage (%)
Literature Review	28	41.2%
Empirical (Quantitative)	18	26.5%
Empirical (Qualitative)	12	17.6%
Mixed Methods	6	8.8%
Theoretical/Conceptual	4	5.9%
Total	68	100%

As shown in Table 3, literature reviews constitute 41.2% of all studies, suggesting that researchers often synthesize existing knowledge rather than generate new primary data. The results of these studies suggest that they are more likely to be synthesized from existing knowledge rather than involving the generation of new data from scratch. Quantitative approaches come in second place in terms of analysis methods, with 26.5% of all research methods displaying the field's interest in quantifying its research outcomes. The majority of respondents (17.6%) believe that qualitative approaches are the third most common method of surveying, indicating a strong interest in understanding the context of the research

project, as indicated in the third most common method. A relatively small proportion of the Research on Mixed Methods (8.8%) illustrates that a limited number of both approaches are being incorporated. In comparison, a few papers are purely theoretical or conceptual (5.5%), indicating that the area is mainly empirical. According to this distribution, scholars are approaching rote learning research from a wide range of perspectives, focusing a great deal on secondary analysis, including literature reviews and related empirical work, while also using a great deal of primary research to inform their work.

To address RQ1, which states: What is the dissemination of the articles according to the years?

The researcher reviewed the findings in Table 4.

Table 4. Distribution according to Year of Publication

Publication Year	Frequency (f)	Percentage (%)
2020	8	11.8%
2021	10	14.7%
2022	9	13.2%
2023	17	23.5%
2024	20	29.4%
2025	4	7.4%
Total	**68**	**100%**

Table 4 shows a clear upward trend in rote learning research output.

The number of publications has steadily increased over time, starting at 11.8% in 2020 and peaking at 29.4% in 2024 due to the number of completed studies. There is a significant progression in academic interests in this area, with nearly 60% of all publications taking place in just the last two years (2023-2024), which indicates a growing interest among academics. The decline in interest to 7.4% for 2025 is likely due to incomplete data rather than a decrease in interest since we are still in the early stages of the publication year, which means less data is available. In the last few years, there has been a consistent increase in studies that delve into rote learning, possibly due to global concerns surrounding pedagogical approaches in various educational systems worldwide, which may summarize systematic changes in educational research over time. There is a significant increase in the number of publications in the years following 2021 compared to previous years, with each subsequent year remaining the same or increasing the number of publications over the previous year.

To address RQ1, which states: What is the dissemination of the articles based on the authors' frequency?

The researcher summarized the results in Table 5.

Table 5.Results

Authors per Article	Frequency (f)	Percentage (%)
1 Author	18	26.5%
2 Authors	15	22.1%
3 Authors	12	17.6%
4 Authors	10	14.7%
5+ Authors	13	19.1%
Total	68	100%

Table 5 shows patterns of collaboration among the researchers. The number of works by one author remains high at 26.5%, reflecting the traditional research model carried out by one author. In contrast, the number of partnerships between two authors accounts for 22.1%, which indicates that many researchers prefer smaller collaborations. The data shows that the frequency of teams changing between three (17.6%) and four (14.7%) authors declines gradually compared to less than that for teams with more than four (17.6%) authors, followed by an unexpected increase for larger teams of five or more researchers (19.1%).

In this study, nearly three-quarters of the papers had some form of co-authorship, indicating that

the field provides both independent and collaborative work, with nearly seventy-five per cent of the papers involving a co-authorship. This significant proportion of multi-author works (51.5% with three or more authors) demonstrates that rote learning research often relies on team-based approaches, possibly reflecting interdisciplinary directions or using data-driven methodologies. In terms of the distribution of scholarship and collective research efforts, the field strikes a balance between individual scholarship and collaborative research.

To address RQ1, which states: What is the dissemination of the articles based on citations per author?

The researcher reviewed the findings in Table 6.

Table 6. Findigs

Citations Per Author	Frequency (f)	Percentage (p)
1	13	5.78%
2	16	7.11%
3	15	6.67%
4	8	3.56%
5	10	4.44%
6	6	2.67%
8	8	3.56%
9	18	8.00%
12	36	16.00%
17	17	7.56%
19	38	16.89%
40	40	17.78%
Total	225	100%

Table 6 shows a significant difference in citation distribution among authors. In the citation landscape, a handful of papers account for almost 35% of the total number of citations per author, and these papers dominate the citation landscape by a wide margin. Most of these papers are considered foundational studies or controversial work, which has generated widespread debate among scientists and other academics. The problem is that over half of the publications (60%) have 12 or fewer citations per author, which means that the research is solid but not that attention-grabbing. There are several clusters of papers with citations of 40 per author (17.8%). However, the most telling cluster is the one with 40 citations per author (17.8%), which probably includes all those niche papers that everybody refers to. A considerable number of publications (26%) have been modestly cited by other researchers (25% with at least five citations per author)—early-career studies, niche findings, or very recent publications yet to gain traction. According to the twin peaks at 12 and 19–40 citations in this research area, this area of research has established go-to references and emerging influence, with the majority of the authors falling somewhere in between. These numbers indicate that academic impact often consists of a few standout papers in a field. At the same time, most research contributes incrementally to that field, even though it significantly contributes to the research field.

DİSCUSSİON AND CONCLUSİON

In this systematic review, 68 studies are synthesized from 2020–2025 to provide valuable insight into the global discourse on rote learning, including its effects on critical thinking and creativity. It aims to analyze the global discourse on rote learning critically. Based on the findings of this study, several key trends can be identified, including a predominance of literature reviews (41.2%), a strong representation of Western countries (especially the U.S. at 26.5%), and an increase in publications that peaks in 2024 (29.5%). Moreover, these findings align with previous research that illustrates the tension between rote memorization and higher-order thinking (Biggs, 1996; Entwistle, 2000), while outlining the lack of diversity from a geographical and methodological perspective.

According to the study's findings, the different types of learning are supported by constructivist

theories (Piaget, 1954; Vygotsky, 1978), which encourage active learning over passive memorization to be effective. Due to these limitations, Mayer (2002) has argued that rote learning does not provide sufficient cognitive flexibility to increase its effectiveness, especially given the high number of literature reviews, which indicates the need for more empirical studies that bridge theory and practice.

While Zhao's (2014) and Tan's (2017) studies on cultural contexts indicate a Western bias in the literature, there is a contrast between the overrepresentation of U.S.-based research and Zhao's (2014) and Tan's (2017) work on cultural contexts. To fill this gap, more studies from underrepresented regions, particularly Africa and Latin America, are required to explain how rote learning functions in diverse educational systems worldwide.

According to Kember (2016), the trend in publications since 2020 reflects a growing global concern about the effects of rote learning. This trend is similar to what Kember has observed about standardized testing environments. Even though collaborative research (73.5% multi-authored works) dominates, citation patterns indicate stark inequalities, with 35% of studies accruing 19+ citations per author, a phenomenon also observed in meta-analyses carried out by Wong and Wong (2002). Based on the results of this study, a small number of influential papers have shaped the field, while most studies remain underutilized.

Limitations and Recommendation

The scope of this review is limited by its reliance primarily on Scopus-indexed articles, which may exclude regional or non-English publications. Future research should incorporate broader databases and mixed-methods approaches (currently only 8.8% of research) to balance synthesis and primary data collection. Longitudinal studies could also assess the impact of changing from conventional rote learning pedagogies to critical-thinking pedagogies over time on student outcomes.

Implications

Accordingly, these findings highlight the need for educators to reform their approach to pedagogy so that the requirement for rote memorization is reduced, particularly within high-stakes testing systems. Policymakers should train teachers in constructivist methods as much as possible, while researchers should address existing geographical and methodological gaps. The result of this review is that, although rote learning still holds a place in acquiring foundational knowledge, its overuse can impede creativity and critical thinking. This conclusion aligns with global calls for a more student-centred, application-based approach to education (Sternberg & Lubart, 1995).

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