Croatian Journal of Education
Vol.28; No.1/2026, pages: 309-335
Review paper
Paper submitted: 11th October 2025
Paper accepted: 04th March 2026
https://doi.org/10.15516/cje.v28.i1.41741

From Trends to Evidence: A Bibliometric and Mini Systematic Review on the Impact of Advance Organizers on Learning Outcomes in Formal Education

Ulin Nuskhi Muti'ah, Anik Ghufron and Sekar Purbarini Kawuryan
Yogyakarta State University, Educational Science Faculty

Abstract

Advance organizers are a learning model introduced by David Ausubel that facilitate meaningful learning by helping learners relate new knowledge to their existing cognitive schemas. As education, technology, and 21st-century learning needs continue to evolve, research on this model continues to develop. This study aims to specifically map research trends and dominant topics over the past two decades. This study employs a bibliometric approach, utilizing article metadata extracted from the SCOPUS database. A total of 82 English-language articles from journal sources were obtained. The results show that the publication trend has been increasing since 2017, with a peak in 2019. The co-occurrence map produced four main clusters. Studies over the past 20 years linking advance organizers to learning outcomes have focused more on university-level education. It was found that male students benefited more from the application of advance organizers.

Keywords: *academic achievement; advance organizer; bibliometric analysis; scopus-indexed literature*

Introduction

Meaningful learning is a learning approach that is emphasized in Indonesia's latest curriculum, namely The Merdeka Belajar curriculum. David Ausubel developed the theory of meaningful learning from the theory of subsumption or assimilation. Meaningful learning emphasizes helping students to place newly acquired knowledge within their existing cognitive structure. Learning is said to be meaningful when

© Author(s) 2026
This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0). https://creativecommons.org/licenses/by-nc/4.0/?utm_source=chatgpt.com

new knowledge has "meaning," that is, a connection to concepts that already exist in the learner's cognitive structure. The theory of meaningful learning is based on cognitive psychology, which studies learning using aspects of mental processes such as perception, thinking, information retrieval, and problem solving (Sexton, 2020). Ausubel encourages teachers to assist students in building their cognitive frameworks for processing and storing information (Ivie, 1998).

Drawing from his meaningful learning theory, Ausubel developed a learning model based on the concepts of assimilation, schemata, and memory, namely the advance organizer. The advance organizer learning model falls under the category of information processing because of its cognitive-based approach (Joyce et al., 2016). Like other experts, Ausubel believed that knowledge acquisition was the main goal of learning. However, unlike other experts at that time, Ausubel rejected the idea that learning through listening, watching, and reading was a passive, meaningless approach that only resulted in memorization. The determining factor in meaningful learning is the readiness of students to receive knowledge, not merely the method (Joyce & Weil, 2003). Even if various methods are used, if children are unable to organize their knowledge, then the knowledge will only reach their working memory and not their long-term memory. Connecting prior knowledge and new material is fundamental to effective learning (Drljača, 2020). Moreover, reading supports meaningful learning among elementary students during the reading process, emphasizing engagement, critical thinking, and language understanding (Đurić, 2018). After all, storing information in long-term memory is one of the goals of learning (Sweller et al., 2011).

The presentation of advance organizers at the beginning of learning helps students prepare their cognitive structures related to the material to be studied. Unlike problem-based learning, inquiry, and discovery approaches, the advance organizer learning model focuses on creating a path for students to avoid misinterpretation of concepts. This principle is especially important for novice learners (Kirschner et al., 2006). However, this does not mean that other learning models are not good, only that for novice learners, it is not appropriate to use a learning approach that adopts an expert approach to problem solving (Clark et al., 2012). Teachers need to understand learning approaches and models because they will affect student engagement and skill development (Mitrevski, 2021; Timoštšuk & Lumi, 2022).

The advance organizer learning model comprises three learning steps, namely (1) presentation of the advance organizer, (2) presentation of material and tasks, (3) reorganization and reinforcement of cognitive structures (Joyce et al., 2016). During the learning process, teachers have more control over the learning process and knowledge structure because it is important to show students the relationship between the organizer and the material, as well as the differences between the material being studied and what has been studied previously. It is hoped that

learning to use this model should enable students to master the material and form a well-organized and solid knowledge structure. In fact, the application of advance organizers is believed to improve inquiry skills and appropriate thinking patterns (Joyce & Weil, 2003). This model benefited learners; it supported the mastery of information and good thinking skills, which complex thinking requires.

Previously, the advance organizer learning model was often associated with memory and concept mastery. However, this model has the potential to prepare participants to think at a higher level. Although the meaningful learning approach is widely accepted as a progressive and appropriate learning approach, studies on the advance organizer learning model which applies its principles remain limited. Teacher sometimes intuitively apply the principle of advance organizers in their teaching without realizing it.

Although studies on advance organizers as a learning model have developed over the past two decades, research has focused on empirical studies. In recent years, bibliometric approaches have become one of the most important methods for identifying research trends, mapping topics, and tracking scientific developments in a particular field. Bibliometric analysis allows researchers to measure and map the characteristics of scientific publications, such as the number of articles, frequently used keywords, year of publication, and distribution of journals and authors' countries. Through this analysis, researchers can obtain an overview of the research direction, identify research gaps, and confirm the relevance of the topics studied. Bibliometric analysis has increasingly been employed in educational research. For instance, previous studies have applied bibliometric approaches to examine dynamics in higher education contexts, demonstrating the effectiveness of this method in synthesizing large-scale academic data (Küçük-Avci et al., 2022). In the context of this study, bibliometric analysis was used to track research trends related to the use of advance organizers in learning. This approach supports the preparation of a more focused and evidence-based Systematic Literature Review (SLR), while ensuring that this study has a strong empirical foundation and a clear position in the existing literature map.

Meta-analyses on advance organizers have been conducted (Luiten et al., 1980; Mayer, 1979) both of which link them with learning and memory outcomes as well as meaningful learning. Unlike the meta-analyses, this study combines bibliometric analysis and systematic literature review to examine trends in research on advance organizers over the past twenty years, the most productive authors, and keyword networks. To date, few studies have combined bibliometric analysis with a mini-Systematic Literature Review to map publication trends, research growth, and author contributions systematically using Scopus-indexed publications. Therefore, this study fills a methodological gap by addressing limitations in mapping approaches and descriptive synthesis in advance organizer studies in the context of formal education.

The results of this study are expected to enrich the study of advance organizers and provide references for academics and education practitioners. The presentation of

the effectiveness and constraints in using the advance organizer model in different fields of study can provide an overview for practitioners in adjusting the use of the advance organizer model according to their needs. These results also provide future researchers with a foundation developinng advance organizer models.

Research questions

To achieve the research objectives, the following four research questions were formulated:

RQ1: How has research on Advance Organizers developed over the past 20 years (2006–2025)?

RQ2: Who are the most productive authors and institutions in research on Advance Organizers over the past 20 years (2006–2025)?

RQ3: What are the main thematic clusters and co-occurrence networks of keywords in research on Advance Organizers over the past 20 years (2006–2025)?

RQ4: What are the main results and research gaps related to the use of Advance Organizers to improve learning outcomes?

Methodology

This study combines a Systematic Literature Review and bibliometric analysis (Hybrid Systematic Literature Review and Bibliometric Analysis). This approach aims to obtain a quantitative overview of research trends through bibliometric analysis and an in-depth understanding of the content and results of the research through systematic SLR analysis. The PRISMA framework was used to ensure comprehensive and replicable literature retrieval. Figure 1 presents the PRISMA flowchart for this study.

The data were sourced from the Scopus Database and then screened using the PRISMA flowchart to group articles that would meet the inclusion criteria. This study employed Scopus as the sole database due to its comprehensive coverage of peer-reviewed literature and robust search capabilities. The database provides advanced search and filtering tools that support a transparent and reproducible review process. Other database such as Web of Science and Google Scholar were considered; however, they were excluded to minimize duplication and ensure methodological consistency. Furthermore, Scopus is widely recognized and commonly employed in high-quality SLR studies, making it a reliable source for identifying relevant and credible literature. Articles that passed were then analysed using bibliometric analysis with VOSviewer software. VOSviewer can produce data visualizations that represent bibliometric networks, including co-authorship, citation, and co-occurrence, which help identify authors, institutions, and countries that contribute significantly to the topic under review (Li & Wei, 2022) and identify trends (Al Husaeni & Nandiyanto, 2022).

Of the 82 articles obtained through Scopus search and analysed in the bibliometric stage, only 24 articles met the inclusion criteria for systematic analysis, namely (1) available

in full-text form, (2) included empirical studies, and (3) focused on the application of Advance Organizer in the context of formal education. Articles that could not be accessed in full were retained in the bibliometric analysis for mapping purposes; but excluded from content analysis.

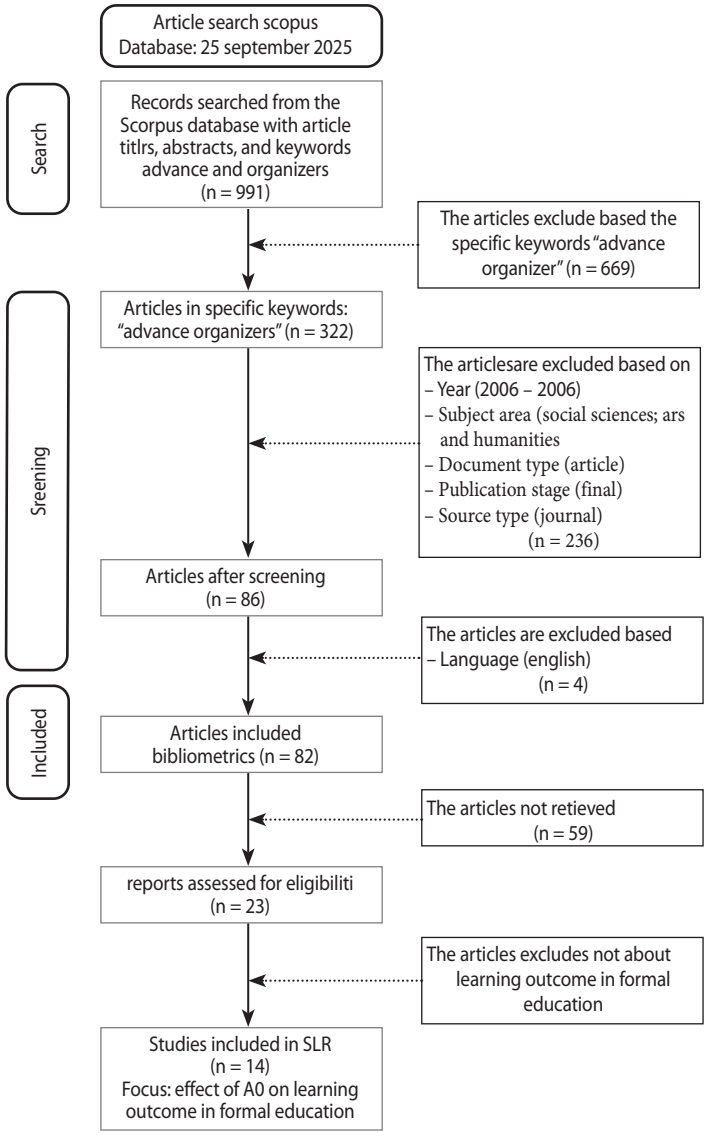


Figure 1. PRISMA Flowchart

Results and discussion

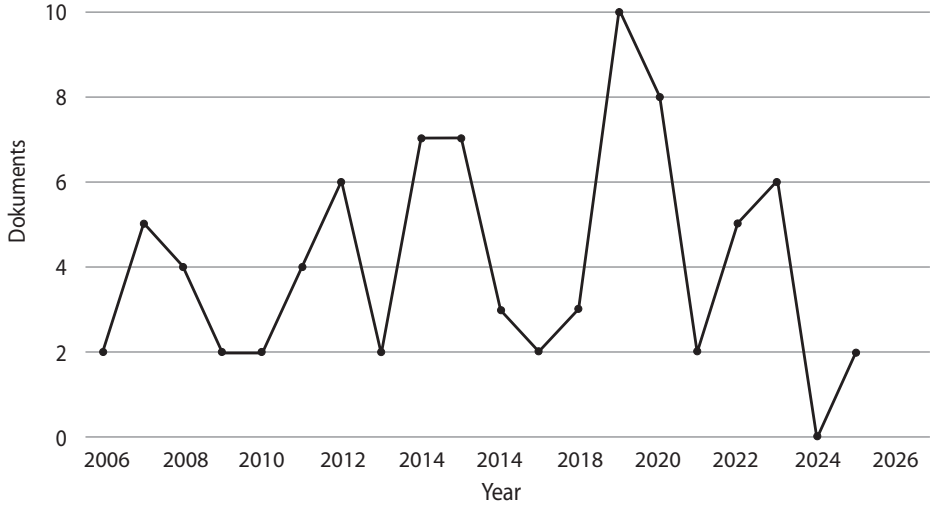
The initial search was conducted by specifying the words advance and organizer in article title, abstracts, and keywords, yielding 991 documents (data retrieved on September 25, 2025). Subsequent; filtering was performed using criteria including year, subject area, document type, publication stage, source type, and language, resulting in 82 articles.

The development of AO research over the years

Based on Scopus database, the research yielded 82 publications on advance organizer research since 2006. Table 1 below shows the development of research on Advance Organizers based on Scopus data from 2006 to 2025.

Table 1
Advance Organizer Research Through the Years

Year	Number of Publications	Year	Number of Publications
2025	2	2015	7
2024	0	2014	7
2023	6	2013	2
2022	5	2012	6
2021	2	2011	4
2020	8	2010	2
2019	10	2009	2
2018	3	2008	4
2017	2	2007	5
2016	3	2006	2



Copyright© 2025Elsevier B.V. All right reserved. Scopus is a registered trademark ofElsevier B.V.

Figure 2. Development of AO research

®

According to Table 1, the number of research publications on advance organizers shows a dynamic trend with a tendency to increase every year. The publications peaked in 2019 with 11 publications. Interestingly, no publications related to advance organizers appeared in 2024, but in 2025, two documents emerged. The data for 2025 is partial because as it was collected in September 2025, so publication numbers may rise by year end. To facilitate observation of the development of the number of publications each year, see Figure 1. Figure 1 was taken from Scopus Analyze.

Researchers with most active in AO publications

The analysis of the most productive Scopus-indexed authors serves to identify the main contributors related to the topic under review, collaboration networks, and assess productivity and scientific influence in research trends regarding advance organizers. Table 2 presents the 10 most productive authors over the last 20 years.

Tabel 2
Ten Top Most Published about AO in Scopus in The Last 20 Years

No.	Author	Affiliation	Country	Number of Publications	Total Link Strength	H-Index (Scopus)
1.	Hung, W.C.	Northern Illinois University	USA	3	2	8
2.	Li, C.H.	National Taiwan Sport University	Taiwan	3	0	6
3.	Cheng, K.H.	National Chung Hsing UniversityThe institution will open in a new tab	Taiwan	2	0	21
4.	Joiner, R.	University of Bath	UK	2	4	23
5.	Kirschner, P.A.	Open Universiteit	Netherlands	2	4	75
6.	Klaassen, K.	Freudenthal Institute	Netherlands	2	0	7
7.	Lockard, J.	Northern Illinois UniversityThe institution will open in a new tab	USA	2	2	3
8.	Popova, A.	Open UniversiteitThe institution will open in a new tab	Netherlands	2	4	4
9.	Price, K.R.	Western Carolina UniversityWestern Carolina University	USA	2	0	1
10.	Roohani, A.	Shahrekord University	Iran	2	0	9

According to Table 2, Hung W.C and Li, C.H. are the authors who have published the most research on advance organizers, with three documents each. To enrich the analysis of author productivity, the h-index value was taken from each author's official Scopus profile (accessed September 25, 2025). It provides an overview of the authors'

overall scientific contributions, not only in the topic of advance organizers. It is known that Hung W.C has more documents, namely 3, with a global h-index of 8, indicating that his research focus is quite consistent with the topic of advance organizers. On the other hand, Kirschner P.A., who has fewer documents related to advance organizers, namely two documents, has the highest h-index of 75. This result shows that even though his contribution to advance organizer research is relatively small, it has the potential to be an important and influential reference for other researchers studying the same topic.



Figure3. Links of Authors' Collaboration

Table 2 also shows that, given the low total link strength, the majority of AO researchers are still conducting independent research. For ease of observation, Figure 3 presents a visualization of the network of collaborating authors. Of the 10 authors, two network groups can be seen, namely Lockard, J. and Hung, W.C., and Joiner, R., Krischner, P.A., and Popova, A. The results on the relationships between authors illustrate the frequency of collaboration between influential authors. The limited level of collaboration indicates that there is still great potential for collaboration between authors, while also indicating the risk that the same research will be repeated.

Network-keyword co-occurence

The results of keyword co-occurrence analysis reveal patterns of interrelationships between concepts that are often studied together in advance organizer (AO) themes. Using VOSviewer, the relationships between keywords are visualized in the form of a network that shows dominant themes and research topic groups. These analysis

results help us understand the main focus and direction of research development over the past two decades.

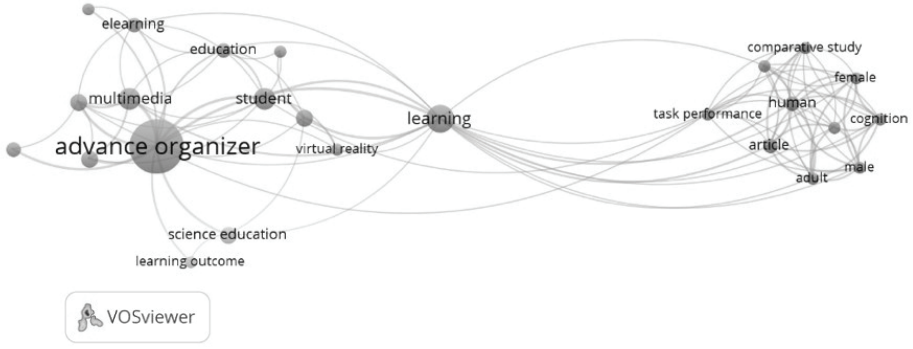


Figure 3. Co-Occurrence by Keywords

Based on Figure 4, the co-occurrence analysis results of 82 articles formed four clusters. Cluster 1, red, consisted of ten words, namely adult, article, cognition, comparative study, controlled study, female, human, male, recall, and task performance. Cluster 2, green, consisted of seven words, namely advance organizer, cognitive load, e-learning, listening comprehension, multimedia, reading comprehension, and visuals. Cluster 3, in blue, consists of 6 words, namely concept mapping, education, information visualization, learning, student, and virtual reality. Cluster 4, in yellow, consists of 2 words, namely learning outcome and science education. Based on Figure 4, it can be understood that the words advance organizer, learning, and student are represented by nodes that are larger than the others. These three words are also connected by network lines, which means that these three words often appear in the same research.

The co-occurrence analysis resulted in four clusters that describe the focus of research over the past two decades. The word group in cluster 1 describes experimental research on the effects of advance organizers on cognitive aspects, including recall and task performance in adult subjects, both male and female. Cluster 2 illustrates that several advance organizer studies integrate it with the use of technology to reduce the cognitive load on the ability to receive information in both written and audio forms. Cluster 3 illustrates that advance organizers in the context of classroom learning are interpreted as strategies for presenting information in the form of concept mapping that uses the latest technology, namely, virtual reality. Meanwhile, cluster 4 illustrates that advance organizers are widely used to solve problems related to learning outcomes in the context of science education in schools. The results of the cluster analysis; established that over the last 20 years, advance organizers have been widely applied in formal learning in experimental studies for solving problems related to cognitive abilities, such as receiving information, remembering, and improving learning outcomes in both adults and school students.

Implementation of advance organizer on students learning

To obtain an overview of studies on the impact of advance organizers on learning outcomes in formal education, 23 articles were selected from 82 articles based on screening criteria, including those classified as gold, bronze, and green open access. Fourteen articles were found to investigate the impact of advance organizers on learning outcomes. The other nine articles were not studied in depth because they did not focus discuss advance organizers as a learning model or strategy, but rather as a theoretical conceptual study (Dziuban et al., 2015; Klaassen et al., 2008; Schreder et al., 2016; Westbroek et al., 2010) and the presentation of the results of the AO model development validation test by learning experts (Majid et al., 2020; Phanichsiti, 2025).

Table 3
Results of the review of 14 accessible articles

No.	Authors	Title	Publication year	Educational level	Course	Research method	Findings
1.	Syaharuddin, Husain, Herianto, Jusmiana (2021)	The effectiveness of advance organiser learning model assisted by Zoom Meeting application	2021	Junior high school (second grade)	Mathematics	Quasi experimental	The integration of AO with Zoom Meetings has a significant positive correlation with improvements in student learning outcomes and attitudes toward learning.
2.	Muhid, Amalia, Hilaliyah, Budiana, and Wajdi (2020)	The effect of metacognitive strategies implementation on students' reading comprehension achievement	2020	Senior high school	Bahasa Indonesia	Quasi experimental	AO as a metacognitive strategy influences reading comprehension skills, but it is not the preferred choice for students. Students tend to choose selective attention.
3.	Gunawan, Harjono, Nisyah, Kusdiastuti, and Herayanti	Improving students' problem-solving skills using inquiry learning model combined with advance organizer	2020	Senior high school	Natural Sciences	Quasi experimental	The combination of inquiry and AO models is more effective than inquiry alone in improving science problem-solving skills.

No.	Authors	Title	Publication year	Educational level	Course	Research method	Findings
4.	Babaei and Izadpanah (2019)	Comparing the effects of different advance organizers on EFL learners' listening comprehension: Key vocabularies, previewing comprehension questions, and multimedia annotations	2019	Senior high school (female students)	ESL	Quasi experimental	AO in the form of pre-teaching key vocabulary and multimedia annotation showed a significant impact compared to previewing comprehension questions on students' listening skills. However, it is believed that this ineffectiveness was influenced by the low ability of the students.
5.	Pramuda, Mundilarto, Kuswanto, and Hadiati (2019)	Effect of real-time physics organizer (RPO) based smartphone and indigenous technology to students' scientific literacy viewed from gender differences	2019	Senior high school	Physics	Quasi Experimental	The integration of AO with mobile learning technology and physics concepts resulted in RPO. The results showed no significant difference in students' overall science literacy. However, when examined based on gender, female students who learned with RPO scored higher than those who used discovery learning. In addition, male students who learned with RPO showed a higher habit of mind than female students.
6.	Nevisi, Hosseinpur, and Kolahkaj (2019)	The impact of marginal glosses and network tree advance organizers on EFL learners' summary writing ability	2019	College	ESL	Quasi experimental	Integrated AO with a networking tree significantly influenced summary writing ability compared to the Marginal Glosses strategy.

No.	Authors	Title	Publication year	Educational level	Course	Research method	Findings
7.	Han van der Meij (2019)	Advance organizers in videos for software training of Chinese students	2018	Junior high school	Software training	Quasi experimental	The integration of Demonstration-Based Training (DBT) with AO has a significant effect on self-efficacy and task performance. Students who learn with AO are more accurate in measuring their abilities and show better long-term effects than those who only learn with DBT.
8.	Yurdakul and Bayat (2017)	The effect of goal setting on listening comprehension	2017	Early childhood education	Listening comprehension skills	Quasi experimental	AO in the form of goal setting effectively improves listening comprehension skills.
9.	Korur, Toker, and Eryilmaz (2016)	Effects of the integrated online advance organizer teaching materials on students' science achievement and attitude	2016	Junior high school	Science	Quasi experimental	The integration of AO with technology and online networks has resulted in the Online Advance Organizer Concept Teaching Material (ONACOM). There was no significant difference between students who learned using ONACOM integrated with inquiry and those who learned using ONACOM integrated with expository. Pretest-posttest results showed that ONACOM was effective in improving science learning achievement.

No.	Authors	Title	Publication year	Educational level	Course	Research method	Findings
10.	Roohani, Jafapour, and Zarei (2015)	Effects of visualisation and advance organisers in reading multimedia-based texts	2015	College	ESL	Quasi experimental	AO in the form of questions is more effective than brief descriptions in terms of college students' reading comprehension abilities.
11.	Popova, Kirschner, and Joiner (2014)	Effects of primer podcasts on stimulating learning from lectures: How do students engage?	2014	Undergraduate Students	Psychology	Quasi experimental	AO in the form of podcasts and epistemic questions effectively improves students' understanding and deep thinking.
12.	Davaei and Talebinezhad (2012)	The effect of advance organizers on enhancing the reading comprehension of Iranian EFL Learners	2012	College	ESL	Quasi experimental	AO effectively improves reading comprehension. AO, in the form of activating background knowledge, shows a more significant impact than listening while reading.
13.	Shihusa and Keraro (2009)	Using advance organizers to enhance students' motivation in learning Biology	2012	Junior High School	Biology	Quasi experimental	AO affects learning motivation. Based on gender differences, male students show higher motivation scores than female students.
14.	Langan-Fox, Platania-Phung, and Waycott (2006)	Effects of advance organizers, mental models and abilities on task and recall performance using a mobile phone network	2006	Undergraduate students	Novice handphone user	Quasi experimental	When viewed from the perspective of task performance, text-based AO is more effective than graphic-based AO. However, neither has a significant effect on students' recall.

Based on the 14 articles, the advance organizer research has mostly been conducted in the field of language, namely, ESL learners (Babaei et al., 2019; Davaei & Talebinezhad, 2012; Nevisi et al., 2019; Roohani et al., 2015). Advance organizers are effective in improving reading comprehension because they help learners obtain a "pathway" in prioritizing attention, organizing, and classifying information (Roohani et al.,

2015). These results reinforce the effectiveness of advance organizers in the field of language because advance organizer studies in the early stages of development were indeed applied in the field of language (Ausubel, 1963; Ausubel, 1977). Students-constructed outline works better than an expert-constructed in collaborative setting (Abdelshaheed, 2023). However, this does not rule out the possibility of advance organizers contributing to other fields, as shown by (Gunawan et al., 2020; Korur et al., 2016; Syaharuddina et al., 2021; van der Meij, 2019).

Research on advance organizers published in Scopus-indexed journals is still more prevalent at the higher education or university level than at other levels of education. Advance organizers in higher education are effective in helping students understand abstract concepts (Nisyah et al., 2020; Tian et al., 2020). Advance organizers also reduce the risk of misconceptions (Palisoa et al., 2023). However, as Ausubel stated, that the advance organizer model can be used at every level of education (Joyce et al., 2016). This suggests a need for studies on the application of advance organizers at lower levels of education. Bibliometric keyword co-occurrence results likewise showed that research at the elementary school level is still very limited.

The form of advance organizer that has been proven effective for adult learners is a sparking question given at the beginning of learning (Popova et al., 2014; Roohani et al., 2015). Meanwhile, while visual and key verbs prove more effective for young learners, (Babaei et al., 2019; Yurdakul & Bayat, 2017). These results are consistent with (Alhazmi, 2024; Han-Chin & Hsueh-Hua, 2017). At the elementary and secondary education levels, learners are still strongly influenced by concrete thinking. Providing information in the form of graphs, maps, or tables helps elementary students learn more effectively (Çalışkan & Uzunkol, 2018).

Another interesting result from this study is that the use of advance organizers positively impact learning outcomes, but when examined by gender, male students show greater benefits than female students (Davaei & Talebinezhad, 2012; Pramuda et al., 2019). According to Bru et al. (2021) male students benefited more from structured learning scenarios with organized information delivery; a characteristic of advance organizers. Male students tend to prefer direct, structured learning focused on core issues, while female students prefer emotionally engaging learning (Kuo et al., 2020). A gender study in learning was conducted by Burušić and Šerić (2015) who found that male students prefer shorter learning periods and are slightly better at abstract thinking than female students. However, female students' attention to detail and superior writing skills make them more adaptable to the education system.

One limitation of this study is its reliance on a single database, Scopus, for data collection. While Scopus is widely recognised for its comprehensive coverage and robust filtering capabilities that help avoid duplication, restricting the search to a single source may have excluded relevant studies indexed elsewhere. As a result, the breadth of the literature reviewed could be affected. Future research is encouraged to incorporate multiple databases to enhance comprehensiveness and minimise selection bias.

Conclusion

Advance organizers are known as a learning model and strategy developed by Ausubel from the subsumption learning theory, to create meaningful learning. With a strong theoretical basis, this model still faces challenges because its approach is considered passive compared to other learning approaches. The systematic literature review and bibliometric methods help describe the development of advance organizer research over the last two decades. The results of the study show that research on advance organizers has developed dynamically but is still limited. Researchers Hung W.C and Li, C.H. are the most productive Scopus-indexed authors of publication on advance organizers. The co-occurrence analysis results identified four main clusters. In-depth analysis shows that advance organizer research in the Scopus database is mostly conducted at the university level. Advance organizers that have been proven effective for adult learners are those in the form of questions, while for younger learners, they are graphics, keywords, and descriptions. Male learners benefit more from advance organizers than female learners.

References

Abdelshaheed, B. S. M. (2023). Student versus expert outlines in reading comprehension: The effect of collaborative construction. *SAGE Open*. https://doi.org/10.1177/21582440231191795

Al Husaeni, D. F., & Nandiyanto, A. B. D. (2022). Bibliometric using vosviewer with publish or perish (using google scholar data): From step-by-step processing for users to the practical examples in the analysis of digital learning articles in pre and post covid-19 pandemic. *ASEAN Journal of Science and Engineering*. https://doi.org/10.17509/ajse.v2i1.37368

Alhazmi, K. (2024). The effect of multimedia on vocabulary learning and retention. *World Journal of English Language*, *14*(6), 390. https://doi.org/10.5430/wjel.v14n6p390

Ausubel, D. G. (1963). Cognitive structure and the facilitation of meaningful verbal learning. *Journal of Teacher Education*, *14*(2), 217–222. https://doi.org/10.1177/002248716301400220

Ausubel, D. P. (1977). The facilitation of meaningful verbal learning in the classroom. *Educational Psychologist*, *12*(2). https://doi.org/10.1080/00461527709529171

Babaei, S., Izadpanah, S., & Araújo, G. C. (2019). Comparing the effects of different advance organizers on EFL learners' listening comprehension: Key vocabularies, previewing comprehension questions, and multimedia annotations. *Cogent Education*, *6*(1). https://doi.org/10.1080/2331186X.2019.1705666

Bru, E., Virtanen, T., Kjetilstad, V., & Niemiec, C. P. (2021). Gender differences in the strength of association between perceived support from teachers and student engagement. *Scandinavian Journal of Educational Research*, *65*(1), 153–168. https://doi.org/10.1080/00313831.2019.1659404

Burušić, J., & Šerić, M. (2015). Girls' and boys' achievements differences in the school context: An overview of possible explanations / Postignuća djevojčica i dječaka u školskom

kontekstu: Pregled mogućih objašnjenja utvrđenih razlika. *Croatian Journal of Education*, *17*(Sp.Ed. No.4), 137–173. https://doi.org/10.15516/cje.v17i0.800

Çalışkan, H., & Uzunkol, E. (2018). A model for explaining student achievement in social studies course / Model za interpretaciju postignuća učenika u predmetu društvene znanosti. *Croatian Journal of Education*, *20*(3), 939–971. https://doi.org/10.15516/cje.v20i3.2729

Clark, R. E., Kirschner, P. A., & Sweller, J. (2012). Putting students on the path to learning the case for fully guided instruction. *American Educator*, *36*.

Davaei, R., & Talebinezhad, M. R. (2012). The effect of advance organizers on enhancing the reading comprehension of Iranian EFL learners. *Theory and Practice in Language Studies*. https://doi.org/10.4304/tpls.2.10.2045-2052

Drljača, M. D. (2020). Constructivist learning theory and logopedagogy in arts education. *Croatian Journal of Education*, *22*(Sp.Ed.1), 181–202. https://doi.org/10.15516/cje.v22i0.3850

Đurić, M. S. (2018). Types of reading tasks in materials for early foreign language learning/ vrste zadataka čitanja u materijalima za početno učenje stranog jezika. *Croatian Journal of Education*, *20*(2), 259–286. https://doi.org/10.15516/cje.v20i0.2895

Dziuban, C., Moskal, P., Thompson, J., Kramer, L., DeCantis, G., & Hermsdorfer, A. (2015). Student satisfaction with online learning: Is it a psychological contract? *Online Learning*, *19*(2). https://doi.org/10.24059/olj.v19i2.496

Gunawan, G., Harjono, A., Nisyah, M., Kusdiastuti, M., & Herayanti, L. (2020). Improving students' problem-solving skills using inquiry learning model combined with advance organizer. *International Journal of Instruction*, *13*(4). https://doi.org/10.29333/iji.2020.13427a

Han-Chin, L., & Hsueh-Hua, C. (2017). Investigations of the effect of format of advance organizers on learners' achievement on understanding of science concepts. *Proceedings - 2017 6th IIAI International Congress on Advanced Applied Informatics, IIAI-AAI 2017*. https://doi.org/10.1109/IIAI-AAI.2017.222

Ivie, S. D. (1998). Ausubel's learning theory: An approach to teaching higher order thinking skills. *The High School Journal*, *82*(1).

Joyce, B., & Weil, M. (2003). *Models of teaching* (Pearson Ed, Vol. 5).

Joyce, B., Weil, M., & Calhoun, E. (2016). *Models of teaching*. Pustaka pelajar.

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, *41*(2). https://doi.org/10.1207/s15326985ep4102_1

Klaassen, K., Westra, A., Emmett, K., Eijkelhof, H., & Lijnse, P. (2008). Introducing mechanics by tapping core causal knowledge. *Physics Education*, *43*(4), 433–439. https://doi.org/10.1088/0031-9120/43/4/014

Korur, F., Toker, S., & Eryılmaz, A. (2016). Effects of the integrated online advance organizer teaching materials on students' science achievement and attitude. *Journal of Science Education and Technology*, *25*(4), 628–640. https://doi.org/10.1007/s10956-016-9618-4

Küçük-Avci, Ş., Topal, M., & İstanbullu, A. (2022). The effects of the covid-19 pandemic on distance education in higher education: A bibliometric analysis study / učinci covid-19 pandemije na obrazovanje na daljinu u visokom obrazovanju: bibliometrijsko istraživanje. *Croatian Journal of Education*, *24*(2), 457–488. https://doi.org/10.15516/cje.v24i2.4534

Kuo, Y.-R., Tuan, H.-L., & Chin, C.-C. (2020). The influence of inquiry-based teaching on male and female students' motivation and engagement. *Research in Science Education*, *50*(2), 549–572. https://doi.org/10.1007/s11165-018-9701-3

Li, J., & Wei, R. (2022). VOSviewer application status and its knowledge base. *Journal of Library and Information Science in Agriculture*, *34*(6), 11. https://doi.org/10.13998/j.cnki.issn1002-1248.21-0843

Luiten, J., Ames, W., & Ackerson, G. (1980). A meta-analysis of the effects of advance organizers on learning and retention. *American Educational Research Journal*, *17*(2). https://doi.org/10.3102/00028312017002211

Majid, A., Ahmad, A., & Arsyad, N. (2020). The development of model advance organizer based mind mapping for student at senior high school. *Universal Journal of Educational Research*, *8*(10), 4433–4439. https://doi.org/10.13189/ujer.2020.081010

Mayer, R. E. (1979). Can advance organizers influence meaningful learning? *Review of Educational Research*, *49*(2), 371–383. https://doi.org/10.3102/00346543049002371

Mitrevski, B. (2021). Prospective science teachers' views about models and modelling. *Journal of Physics: Conference Series*. https://doi.org/10.1088/1742-6596/1882/1/012144

Nevisi, R. B., Hosseinpur, R. M., & Kolahkaj, R. (2019). The impact of marginal glosses and network tree advance organizers on efl learners' summary writing ability. *The Journal of AsiaTEFL*, *16*(4), 1168–1181. https://doi.org/10.18823/asiatefl.2019.16.4.7.1168

Nisyah, M., Gunawan, G., Harjono, A., & Kusdiastuti, M. (2020). Inquiry learning model with advance organizers to improve students' understanding on physics concepts. *Journal of Physics: Conference Series*, *1521*(2), 022057. https://doi.org/10.1088/1742-6596/1521/2/022057

Palisoa, N., Lumamuly, V. E., & Lumamuly, A. (2023). Advance organizer integrated conceptual change learning model to prevent potential misconceptions of high school students in chemical concept. *AIP Conference Proceedings*, *2642*(1), 090016. https://doi.org/10.1063/5.0110604

Phanichsiti, S. (2025). Advance organizer integrating visual-based programming via artificial intelligence of things to enhance advanced computational thinking competency. *International Journal of Information and Education Technology*, *15*(7), 1355–1367. https://doi.org/10.18178/ijiet.2025.15.7.2337

Popova, A., Kirschner, P. A., & Joiner, R. (2014). Effects of primer podcasts on stimulating learning from lectures: How do students engage? *British Journal of Educational Technology*, *45*(2), 330–339. https://doi.org/10.1111/bjet.12023

Pramuda, A., Mundilarto, M., Kuswanto, H., & Hadiati, S. (2019). Effect of real-time physics organizer based smartphone and indigenous technology to students' scientific literacy viewed from gender differences. *International Journal of Instruction*, *12*(3), 253–270. https://doi.org/10.29333/iji.2019.12316a

Roohani, A., Jafarpour, A., & Zarei, S. (2015). Effects of visualisation and advance organisers in reading multimedia-based texts. *3L: The Southeast Asian Journal of English Language Studies*, *21*(2), 47–62. https://doi.org/10.17576/3L-2015-2102-04

Schreder, G., Windhager, F., Smuc, M., & Mayr, E. (2016). A mental models perspective on designing information visualizations for political communication. *JeDEM - EJournal of EDemocracy and Open Government*, *8*(3), 80–99. https://doi.org/10.29379/jedem.v8i3.443

Sexton, S. X. (2020). Meaningful learning- David P. Ausubel. In B. Akpan & T. J. Kennedy (Eds.), *Science education in theory and practice: An introductory guide to learning theory*. Springer Text in Education.

Sweller, J., Ayres, P., & Kalyuga, S. (2011). *Cognitive load theory*. Springer.

Syaharuddina, S., Husain, H., Herianto, H., & Jusmiana, A. (2021). The effectiveness of advance organiser learning model assisted by Zoom Meeting application. *Cypriot Journal of Educational Sciences*, *16*(3), 952–966. https://doi.org/10.18844/cjes.v16i3.5769

Tian, Z., Zhang, K., Zhang, T., Dai, X., & Lin, J. (2020). Application of ausubel cognitive assimilation theory in teaching/learning medical biochemistry and molecular biology. *Biochemistry and Molecular Biology Education*, *48*(3), 202–219. https://doi.org/10.1002/bmb.21327

Timoštšuk, I., & Lumi, N. (2022). Reflection of concept modelling on student teachers' learning experiences from a primary education perspective. *Journal of Teacher Education for Sustainability*, *24*(1), 116–128. https://doi.org/10.2478/jtes-2022-0009

van der Meij, H. (2019). Advance organizers in videos for software training of Chinese students. *British Journal of Educational Technology*, *50*(3), 1368–1380. https://doi.org/10.1111/bjet.12619

Westbroek, H. B., Klaassen, K., Bulte, A., & Pilot, A. (2010). Providing students with a sense of purpose by adapting a professional practice. *International Journal of Science Education*, *32*(5), 603–627. https://doi.org/10.1080/09500690902721699

Yurdakul, Y., & Bayat, N. (2017). The effect of goal setting on listening comprehension. *Education and Science*, *42*(190), 249–267. https://doi.org/10.15390/EB.2017.7173

Ulin Nuskhi Muti'ah
Yogyakarta State University, Educational Science Faculty
Jl. Colombo No.1, 55281 Sleman
Special Region of Yogyakarta, Indonesia
ulinnuskhi.2022@student.uny.ac.id

Anik Ghufron
Yogyakarta State University, Educational Science Faculty
Jl. Colombo No.1, 55281 Sleman
Special Region of Yogyakarta, Indonesia
anikghufron@uny.ac.id

Sekar Purbarini Kawuryan
Yogyakarta State University, Educational Science Faculty
Jl. Colombo No.1, 55281 Sleman
Special Region of Yogyakarta, Indonesia
sekarpurbarini@uny.ac.id

Od trendova do dokaza: bibliometrijski i kratki pregled literature o učincima naprednih organizatora na ishode učenja u formalnom obrazovanju

Sažetak

Model naprednoga organiziranja, koji je razvio David Ausubel, jest model učenja koji potiče smisleno učenje pomažući učenicima da novo znanje povežu s postojećim kognitivnim shemama. Kako se obrazovanje, tehnologija, i potrebe učenja za 21. stoljeće razvijaju, tako se razvija i istraživanje spomenutoga modela. Cilj ovoga istraživanja jest posebno mapirati istraživačke trendove i dominantne teme u posljednja dva desetljeća. U istraživanju je primijenjen bibliometrijski pristup pri čemu su korišteni metapodatci članaka iz baze SCOPUS. Iz baza časopisa dobivena su ukupno 82 rada na engleskome jeziku. Rezultati pokazuju da je trend objavljivanja u porastu od 2017. godine, s vrhuncem u 2019. godini. Mapa su-pojavljivanja iznjedrila je četiri glavne grupe ili klastera. Tijekom posljednjih 20 godina, istraživanja koja povezuju napredne organizatore s ishodima učenja uglavnom su bila usmjerena na sveučilišnu razinu obrazovanja. Utvrđeno je da studenti imaju više koristi od primjene naprednih organizatora od studentica.

Ključne riječi: *akademsko postignuće; bibliometrijska analiza; napredni organizatori; Scopus-baza radova*

Uvod

Smisleno učenje je pristup učenju koji je naglašen u najnovijem indonezijskom kurikulu, tzv. kurikulu Merdeka Belajar. David Ausubel razvio je teoriju smislenoga učenja polazeći od teorije supsumpcije odnosno asimilacije. Smisleno učenje stavlja naglasak na pomaganje učenicima u uključivanje novostečenoga znanja unutar njihove postojeće kognitivne strukture. Učenje je smisleno kada novo znanje ima „značenje", odnosno kada je povezano s pojmovima koji već postoje u učenikovoj kognitivnoj strukturi. Teorija smislenoga učenja utemeljena je na kognitivnoj psihologiji koja proučava učenje s aspekta mentalnih procesa kao što su percepcija, mišljenje, dohvat informacija i rješavanje problema (Sexton, 2020). Ausubel potiče učitelje na pružanje pomoći učenicima u izgradnji kognitivnih okvira za obradu i pohranu informacija (Ivie, 1998).

Polazeći od svoje teorije smislenoga učenja, Ausubel je razvio model učenja utemeljen na konceptima asimilacije, shema i pamćenja, poznat kao model naprednih organizatora. Model učenja s naprednim organizatorima svrstava se u skupinu modela usmjerenih na obradu informacija zbog svojega kognitivno utemeljenoga pristupa (Joyce i sur., 2016). Poput drugih autora, Ausubel je smatrao da je stjecanje znanja glavni cilj učenja. Međutim, za razliku od brojnih suvremenika, odbacio je shvaćanje da je učenje slušanjem, gledanjem i čitanjem pasivan, besmislen proces koji rezultira samo memoriranjem. Odlučujući čimbenik u smislenom učenju jest spremnost učenika na primanje znanja, a ne isključivo metoda poučavanja (Joyce i Weil, 2003). Čak i kada se primjenjuju različite metode, ako učenici ne mogu organizirati svoje znanje, ono će dosegnuti samo radno pamćenje, ali ne i dugoročno. Povezivanje predznanja s novim sadržajima ključno je za učinkovito učenje (Drljača, 2020). Nadalje, čitanje podupire smisleno učenje učenika razredne nastave jer tijekom procesa čitanja potiče angažiranost, kritičko mišljenje i razumijevanje jezika (Đurić, 2018). U konačnici, pohranjivanje informacija u dugoročno pamćenje jedan je od osnovnih ciljeva učenja (Sweller i sur., 2011).

Prikaz naprednih organizatora na početku učenja pomaže učenicima pripremiti njihove kognitivne strukture povezane sa sadržajem koji će se obrađivati. Za razliku od problemski usmjerenoga, istraživačkoga i otkrivalačkoga pristupa učenju, model učenja s naprednim organizatorima usredotočuje se na stvaranje puta koji učenicima pomaže izbjeći pogrešna tumačenja pojmova. Ovo je načelo osobito važno za početnike (Kirschner i sur., 2006). To, međutim, ne znači da su drugi modeli učenja loši, nego da za početnike nije primjereno koristiti pristupe učenju koji podrazumijevaju ekspertnu razinu rješavanja problema (Clark i sur., 2012). Učitelji trebaju razumjeti pristupe i modele učenja jer oni utječu na angažiranost učenika i razvoj vještina (Mitrevski, 2021; Timoštšuk i Lumi, 2022).

Model učenja s naprednim organizatorima obuhvaća tri faze učenja: (1) prikaz naprednoga organizatora, (2) prikaz gradiva i zadataka te (3) reorganizaciju i učvršćivanje kognitivnih struktura (Joyce i sur., 2016). Tijekom učenja učitelj ima veću kontrolu nad procesom učenja i strukturom znanja jer je važno učenicima pokazati povezanost između organizatora i gradiva te razlike između gradiva koje se uči i onoga što je već obrađeno. Očekuje se da će učenje uz ovaj model omogućiti učenicima usvajanje gradiva i oblikovanje dobro organizirane i čvrste strukture znanja. Štoviše, smatra se da primjena naprednih organizatora pridonosi razvoju istraživačkih vještina i primjerenih misaonih obrazaca (Joyce i Weil, 2003). Ovaj model pokazao se korisnim za učenike jer podupire ovladavanje informacijama i razvijanje kvalitetnih misaonih vještina, nužnih za složeno mišljenje.

Model učenja s naprednim organizatorima ranije se uglavnom dovodio u vezu s pamćenjem i ovladavanjem pojmovima. Međutim, ovaj model ima potencijal pripremiti učenike za mišljenje na višoj razini. Iako je pristup smislenom učenju široko prihvaćen kao progresivan i primjeren pristup učenju, istraživanja modela učenja s naprednim organizatorima koji primjenjuje njegova načela i dalje su ograničena. Učitelji ponekad

intuitivno primjenjuju načelo naprednih organizatora u svojoj nastavi, a da toga nisu ni svjesni.

Iako su se istraživanja naprednih organizatora kao modela učenja razvijala tijekom posljednja dva desetljeća, većina je radova bila usmjerena na empirijska istraživanja. Posljednjih su godina bibliometrijski pristupi postali jedan od najvažnijih načina za identificiranje istraživačkih trendova, mapiranje tema i praćenje znanstvenoga razvoja u određenom području. Bibliometrijska analiza istraživačima omogućuje mjerenje i mapiranje obilježja znanstvenih publikacija, poput broja članaka, često korištenih ključnih riječi, godina objave, distribucije časopisa te zemalja iz kojih autori dolaze. Takva analiza pruža uvid u smjer istraživanja, omogućuje prepoznavanje istraživačkih praznina i potvrđuje relevantnost obrađivanih tema. Bibliometrijska se analiza sve češće primjenjuje u obrazovnim istraživanjima; primjerice, prethodne su studije primijenile bibliometrijski pristup za ispitivanje dinamike u kontekstu visokoga obrazovanja, čime je potvrđena učinkovitost ove metode u sintezi opsežnih akademskih podataka (Küçük-Avci i sur., 2022). U okviru ovoga istraživanja bibliometrijska je analiza korištena za praćenje istraživačkih trendova povezanih s primjenom naprednih organizatora u učenju. Time se podupire izrada fokusiranijega i na dokazima utemeljenoga sustavnog pregleda literature (SLR) te osigurava snažna empirijska podloga i jasna pozicija ovoga rada unutar postojeće literature.

Metaanalize o naprednim organizatorima već su provedene (Luiten i sur., 1980; Mayer, 1979), a obje ih povezuju s ishodima učenja i pamćenja te sa smislenim učenjem. Za razliku od tih metaanaliza, u ovome istraživanju povezuju se bibliometrijska analiza i sustavni pregled literature kako bi se ispitalo trendove u istraživanjima o naprednim organizatorima u posljednjih dvadeset godina, najproduktivnije autore i mreže ključnih riječi. Do sada je tek mali broj istraživanja kombinirao bibliometrijsku analizu s minisustavnim pregledom literature radi sustavnoga mapiranja trendova publikacija, rasta istraživanja i doprinosa autora na temelju publikacija indeksiranih u Scopusu. Stoga ovo istraživanje popunjava metodološku prazninu time što se dotiče ograničenja dosadašnjih pristupa mapiranju i deskriptivnoj sintezi istraživanja o naprednim organizatorima u kontekstu formalnoga obrazovanja.

Očekuje se da će rezultati ovoga istraživanja obogatiti spoznaje o naprednim organizatorima i poslužiti kao referenca akademskoj i odgojno-obrazovnoj praksi. Prikaz učinkovitosti i ograničenja primjene modela naprednih organizatora u različitim znanstvenim područjima može nastavnicima pružiti uvid u mogućnosti prilagodbe njegove primjene vlastitim potrebama. Nalazi također pružaju uporište budućim istraživačima za daljnji razvoj modela naprednih organizatora.

Istraživačka pitanja

Kako bi se ostvarili istraživački ciljevi, oblikovana su sljedeća četiri istraživačka pitanja:

IP1: Kako se istraživanje o naprednim organizatorima razvijalo tijekom posljednjih 20 godina (2006. – 2025.)?

IP2: Tko su najproduktivniji autori i institucije u istraživanjima o naprednim organizatorima tijekom posljednjih 20 godina (2006. – 2025.)?

IP3: Koje su glavne tematske grupe ili klastera i mreže supojavnosti ključnih riječi u istraživanjima o naprednim organizatorima tijekom posljednjih 20 godina (2006. – 2025.)?

IP4: Koji su glavni nalazi i praznine u istraživanjima povezane s primjenom naprednih organizatora za unaprjeđivanje ishoda učenja?

Metodologija

Ovo istraživanje kombinira sustavni pregled literature (engl. *SRL - Systematic Literature Review*) i bibliometrijsku analizu (hibridni sustavni pregled literature i bibliometrijska analiza). Takav pristup omogućuje dobivanje kvantitativnoga pregleda istraživačkih trendova putem bibliometrijske analize te dublje razumijevanje sadržaja i istraživačkih nalaza putem sustavne SLR-analize. PRISMA okvir korišten je kako bi se osiguralo sveobuhvatno i ponovljivo pretraživanje literature. Slika 1 prikazuje PRISMA dijagram tijeka za ovo istraživanje.

Podatci su dobiveni iz Scopus baze te su potom filtrirani pomoću PRISMA dijagrama tijeka kako bi se izdvojili članci koji zadovoljavaju kriterije uključivanja. Ovo je istraživanje koristilo isključivo Scopus bazu zbog njezine sveobuhvatne pokrivenosti recenzirane literature i naprednih mogućnosti pretraživanja. Baza nudi napredne alate za pretraživanje i filtriranje koji podupiru transparentan i ponovljiv postupak pregleda. Druge baze, poput Web of Science i Google Scholar, razmatrane su, ali su isključene kako bi se smanjilo dupliciranje zapisa i osigurala metodološka dosljednost. Štoviše, Scopus je široko prepoznat i često se koristi u visokokvalitetnim sustavnim pregledima literature, što ga čini pouzdanim izvorom za identificiranje relevantne i vjerodostojne literature.

Članci koji su prošli postupak selekcije analizirani su bibliometrijskom analizom u programu VOSviewer. VOSviewer omogućuje izradu vizualizacija koje prikazuju bibliometrijske mreže, uključujući suautorstava, citiranja i supojavnossti, čime se olakšava prepoznavanje autora, institucija i zemalja koje značajno doprinose obrađenoj temi (Li i Wei, 2022), kao i prepoznavanju trendova (Al Husaeni i Nandiyanto, 2022)

Od ukupno 82 članka dobivena pretraživanjem baze Scopus koja su analizirana u bibliometrijskoj fazi, samo je 24 članka zadovoljilo kriterije uključivanja u sustavnu analizu: (1) dostupnost cjelovitoga teksta, (2) uključenost empirijskih istraživanja i (3) usmjerenost na primjenu naprednih organizatora u kontekstu formalnoga obrazovanja. Članci koji nisu bili dostupni u cjelovitom tekstu zadržani su u bibliometrijskoj analizi u svrhu mapiranja, ali su isključeni iz analize sadržaja.

Slika 1.

Rezultati i diskusija

Početno pretraživanje provedeno je navođenjem riječi *advance* i *organizer* u naslovu članka, sažetcima i ključnim riječima, pri čemu je dobiven 991 dokument (podatci

preuzeti 25. rujna 2025.). Naknadno je provedeno filtriranje prema kriterijima godine, predmetnoga područja, vrste dokumenta, faze objave, vrste izvora i jezika, čime je broj radova sužen na 82 članka.

Razvoj istraživanja o naprednim organizatorima tijekom godina

Na temelju podataka iz Scopus baze od 2006. godine identificirane su 82 publikacije koje se bave istraživanjima naprednih organizatora. Tablica 1 prikazuje razvoj istraživanja o naprednim organizatorima prema Scopus podatcima za razdoblje od 2006. do 2025. godine.

Tablica 1

Slika 2.

Prema Tablici 1, broj istraživačkih publikacija o naprednim organizatorima pokazuje dinamičan trend s tendencijom rasta iz godine u godinu. Broj publikacija dosegnuo je vrhunac 2019. godine, kada je zabilježeno 11 radova. Zanimljivo je da 2024. godine nije bilo publikacija povezanih s naprednim organizatorima, dok su se 2025. pojavila dva rada. Podatci za 2025. godinu djelomični su jer su prikupljeni u rujnu 2025., pa se broj publikacija do kraja godine mogao dodatno povećati. Radi lakšega praćenja broja publikacija po godinama, vidi Sliku 1. Slika 1 preuzeta je iz alata Scopus Analyze.

Najaktivniji istraživači u području naprednih organizatora

Analiza najproduktivnijih autora indeksiranih u Scopusu omogućuje prepoznavanje glavnih autora koji doprinose proučavanoj temi, uvida u obrasce suradnje te procjenu produktivnosti i znanstvenoga utjecaja unutar istraživačkih trendova o naprednim organizatorima. Tablica 2 prikazuje deset najproduktivnijih autora u posljednjih 20 godina

Tablica 2

Prema Tablici 2, Hung, W. C. i Li, C. H. autori su koji su objavili najviše radova o naprednim organizatorima, svaki po tri rada. Radi obogaćivanja analize produktivnosti autora, za svakog je autora preuzet h-indeks s njegova službenoga Scopus profila (pristup 25. rujna 2025.), što pruža uvid u ukupni znanstveni doprinos autora, a ne samo u radove o naprednim organizatorima. Utvrđeno je da Hung, W. C. ima tri rada te globalni h-indeks 8, što upućuje na to da je njegov istraživački fokus prilično usklađen s temom naprednih organizatora. S druge strane, Kirschner, P. A., koji ima manje radova posebno vezanih uz napredne organizatore (dva rada), ostvaruje najviši h-indeks, 75. Ovaj nalaz pokazuje da, iako je njegov izravan doprinos istraživanjima naprednih organizatora razmjerno malen, njegovi radovi imaju potencijal biti važna i utjecajna referenca za druge istraživače koji se bave istom temom.

Slika 3.

Tablica 2 također pokazuje da, s obzirom na nisku ukupnu jačinu povezanosti (engl. *total link strength*), većina istraživača naprednih organizatora još uvijek provodi istraživanja samostalno. Radi lakšega uvida, na Slici 3 prikazana je vizualizacija mreže autora koji surađuju. Od deset autora u analizi vidljiva su dva mrežna klastera: jedan čine Lockard, J. i Hung, W. C., a drugi Joiner, R., Kirschner, P. A. i Popova, A. Rezultati o odnosima među autorima upućuju na učestalost suradnje između utjecajnih autora. Ograničena razina suradnje sugerira, s jedne strane, da još uvijek postoji značajan potencijal za intenzivniju suradnju među autorima, a s druge strane upućuje na rizik ponavljanja istih istraživačkih tema.

Supojavnost mreže – ključne riječi

Rezultati analize supojavnosti ključnih riječi otkrivaju obrasce međusobnih odnosa između koncepata koji se najčešće proučavaju zajedno u okviru tema naprednih organizatora (AO). Pomoću programa VOSviewer ti se odnosi vizualiziraju u obliku mreže koja prikazuje dominantne teme i skupine istraživačkih područja. Takva analiza pomaže u razumijevanju glavnoga istraživačkog fokusa i smjera razvoja istraživanja tijekom posljednja dva desetljeća.

Slika 4.

Na temelju Slike 4, rezultati analize supojavnosti ključnih riječi u 82 članka oblikovali su četiri grupe (klastera). Grupa 1 (crveni) sastoji se od deset riječi: *adult, article, cognition, comparative study, controlled study, female, human, male, recall* i *task performance*. Grupa 2 (zeleni) obuhvaća sedam riječi: *advance organizer, cognitive load, e-learning, listening comprehension, multimedia, reading comprehension* i *visuals*. Grupa 3 (plavi) sastoji se od šest riječi: *concept mapping, education, information visualization, learning, student* i *virtual reality*. Grupa 4 (žuti) uključuje dvije riječi: *learning outcome* i *science education*. Na temelju Slike 4 vidljivo je da su riječi *advance organizer*, *learning* i *student* prikazane čvorovima većima od ostalih. Ta su tri pojma međusobno povezana mrežnim linijama, što znači da se često pojavljuju u istim istraživanjima.

Analiza supojavnosti ključnih riječi rezultirala je s četiri grupe koji opisuju fokus istraživanja u posljednja dva desetljeća. Skupina riječi u grupi 1 upućuje na eksperimentalna istraživanja učinaka naprednih organizatora na kognitivne aspekte, uključujući dosjećanje i izvođenje zadataka među odraslim ispitanicima – muškaracima i ženama. Grupa 2 pokazuje da se u pojedinim istraživanjima napredni organizatori integriraju s uporabom tehnologije radi smanjenja kognitivnoga opterećenja pri primanju informacija u pisanom i auditivnom obliku. Grupa 3 pokazuje da se napredni organizatori u kontekstu nastave u razredu tumače kao strategije za prezentaciju informacija u obliku konceptualnih mapa koje se oslanjaju na suvremenu tehnologiju, ponajprije virtualnu stvarnost. Grupa 4 pak upućuje na to da se napredni organizatori često koriste za rješavanje problema povezanih s ishodima učenja u području prirodoslovnih predmeta u školama. Rezultati klaster-analize pokazuju da su se u posljednjih 20 godina napredni organizatori naširoko primjenjivali u formalnom

obrazovanju, ponajprije u eksperimentalnim studijama usmjerenima na probleme kognitivnih sposobnosti, poput primanja informacija, pamćenja i poboljšavanja ishoda učenja u odraslih i učenika osnovnih i srednjih škola.

Primjena naprednih organizatora u učenju učenika

Kako bi se dobio uvid u studije koje istražuju učinke naprednih organizatora na ishode učenja u formalnom obrazovanju, iz korpusa od 82 članka odabrana su 23 rada na temelju kriterija selekcije, uključujući i one klasificirane kao zlatni, brončani i zeleni otvoreni pristup. U četrnaest je radova ispitivan utjecaj naprednih organizatora na ishode učenja. Preostalih devet radova nije detaljnije analizirano jer im fokus nije bio na naprednim organizatorima kao modelu ili strategiji učenja, nego su ih razmatrali pretežno na teorijsko-konceptualnoj razini (Dziuban i sur., 2015; Klaassen i sur., 2008; Schreder i sur., 2016; Westbroek i sur., 2010) ili su se bavili prikazom rezultata validacijskih provjera modela AO-a koje su proveli stručnjaci za učenje (Majid i sur., 2020; Phanichsiti, 2025).

Tablica 3

Na temelju 14 analiziranih članaka može se zaključiti da je većina istraživanja o naprednim organizatorima provedena u području jezika, ponajprije među učenicima engleskoga kao drugoga jezika (ESL) (Babaei i sur., 2019; Davaei i Talebinezhad, 2012; Nevisi i sur., 2019; Roohani i sur., 2015). Napredni organizatori pokazuju se učinkovitim u poboljšanju čitanja s razumijevanjem jer učenicima pomažu oblikovati „putanju" za usmjeravanje pozornosti, organiziranje i razvrstavanje informacija (Roohani i sur., 2015). Ovi nalazi dodatno potvrđuju učinkovitost naprednih organizatora u jezičnome području budući da su i rane studije o naprednim organizatorima bile primarno usmjerene na poučavanje jezika (Ausubel, 1963; Ausubel, 1977). Pokazalo se i da skice koje izrađuju sami studenti daju bolje rezultate od onih koje je izradio stručnjak, osobito u suradničkom okružju (Abdelshaheed, 2023). Ipak, to ne znači da je primjena naprednih organizatora ograničena samo na jezično područje, što potvrđuju i istraživanja u drugim područjima (Gunawan i sur., 2020; Korur i sur., 2016; Syaharuddina i sur., 2021; van der Meij, 2019).

Istraživanja o naprednim organizatorima objavljena u časopisima indeksiranima u Scopusu i dalje su znatno češća na razini visokoga obrazovanja ili sveučilišta nego na drugim razinama obrazovanja. U visokome obrazovanju napredni organizatori pokazuju se učinkovitim u pomaganju studentima pri razumijevanju apstraktnih pojmova (Nisyah i sur., 2020; Tian i sur., 2020). Napredni organizatori također smanjuju rizik od pojave nesporazuma ili pogrešnih shvaćanja (Palisoa i sur., 2023). Ipak, Ausubel ističe da se model naprednih organizatora može primjenjivati na svim razinama obrazovanja (Joyce i sur., 2016). To upućuje na potrebu za većim brojem istraživanja o primjeni naprednih organizatora na nižim razinama obrazovanja. Rezultati bibliometrijske analize supojavnosti ključnih riječi dodatno pokazuju da su istraživanja na razini primarnoga obrazovanja i dalje vrlo ograničena.

Oblik naprednoga organizatora koji se pokazao učinkovitim za odrasle polaznike jest poticajno pitanje postavljeno na početku učenja (Popova i sur., 2014; Roohani i sur., 2015). Nasuprot tome, za mlađe učenike učinkovitijima su se pokazali vizualni prikazi i ključni glagoli (Babaei i sur., 2019; Yurdakul i Bayat, 2017). Ovi su nalazi u skladu s rezultatima drugih istraživanja (Alhazmi, 2024; Han-Chin i Hsueh-Hua, 2017). Na razini osnovnoga i srednjoškolskoga obrazovanja učenici se i dalje snažno oslanjaju na konkretno mišljenje pa pružanje informacija u obliku grafikona, mapa ili tablica pomaže učenicima ranoga osnovnog obrazovanja u učinkovitijem učenju (Çalışkan i Uzunkol, 2018).

Još jedan zanimljiv nalaz ovoga istraživanja jest da primjena naprednih organizatora pozitivno utječe na ishode učenja, ali da, promatra li se prema spolu, učenici ostvaruju veće koristi od učenica (Davaei i Talebinezhad, 2012; Pramuda i sur., 2019). Bru i sur. (2021) navode da dječaci više profitiraju od strukturiranih scenarija učenja s jasno organiziranom prezentacijom informacija – obilježjem koje je tipično za napredne organizatore. Učenici – dječaci, skloniji su izravnom, strukturiranom učenju usmjerenom na ključne probleme, dok učenice preferiraju učenje koje emocionalno angažira (Kuo i sur., 2020). Istraživanje roda u kontekstu učenja proveli su i Burušić i Šerić (2015), koji su utvrdili da učenici preferiraju kraća razdoblja učenja i pokazuju blago bolje sposobnosti apstraktnoga mišljenja od učenica. Ipak, sklonost učenica detaljima te njihove bolje vještine pisanoga izražavanja čine ih prilagodljivijima školskom sustavu.

Jedno od ograničenja ovoga istraživanja jest oslanjanje na samo na jednu bazu podataka, Scopus, za prikupljanje informacija. Iako je Scopus naširoko prepoznat po svojoj sveobuhvatnoj pokrivenosti i robusnim mogućnostima filtriranja koja pomažu u izbjegavanju dupliciranja zapisa, ograničavanje pretraživanja na jedan izvor može dovesti do izostavljanja relevantnih istraživanja indeksiranih u drugim bazama. Posljedično, širina obuhvaćene literature potencijalno je smanjena ili ograničena. Buduća bi istraživanja stoga trebala uključiti više baza podataka kako bi se povećala sveobuhvatnost pregleda i smanjio rizik od pristranosti u odabiru studija.

Zaključak

Napredni organizatori poznati su kao model i strategija učenja koju je Ausubel razvio iz teorije učenja putem supsumpcije kako bi potaknuo smisleno učenje. Unatoč snažnim teorijskim temeljima, ovaj model i dalje se suočava s izazovima jer se njegov pristup katkad smatra pasivnim u usporedbi s drugim didaktičkim pristupima. Sustavni pregled literature u kombinaciji s bibliometrijskim metodama omogućio je pregled razvoja istraživanja o naprednim organizatorima tijekom posljednja dva desetljeća. Rezultati pokazuju da se istraživanja o naprednim organizatorima razvijaju dinamično, ali su još uvijek brojčano ograničena. Istraživači Hung, W. C. i Li, C. H. najproduktivniji su autori, prema broju indeksiranih publikacija u Scopusu o naprednim organizatorima. Analiza supojavnosti ključnih riječi izdvojila je četiri glavne grupe ili klastera. Detaljnija analiza upućuje na to da se većina istraživanja o naprednim

organizatorima u bazi Scopus provodi na sveučilišnoj razini. Poticajna pitanja pokazala su se učinkovitim oblicima naprednih organizatora za odrasle polaznike, dok se za mlađe učenike najučinkovitijima pokazuju grafički prikazi, ključne riječi i kratki opisi. Prema dostupnim istraživanjima, učenici imaju više koristi od primjene naprednih organizatora nego učenice.