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Text Mining dari Jurnal Teknologi Pendidikan Menggunakan *Term Frequency Matrix*

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Abstrak. Penelitian ini bertujuan untuk menganalisis kata-kata yang paling sering muncul dalam beberapa artikel yang diterbitkan oleh Jurnal Teknologi Pendidikan menggunakan pendekatan term frequency matrix. Melalui teknik text mining, data dari abstrak artikel diolah untuk mengidentifikasi kata-kata kunci dan memahami pola penelitian dalam bidang teknologi pendidikan. Analisis dilakukan pada tiga edisi terakhir jurnal, yaitu Vol. 7 No. 3, Vol. 7 No. 4, dan Vol. 8 No. 1, dengan memanfaatkan metode matematika berbasis frekuensi kata. Data diolah melalui tahapan preprocessing, tokenisasi, dan pembuatan matriks frekuensi term, diikuti oleh analisis statistik deskriptif dan pemodelan distribusi. Hasil penelitian menunjukkan bahwa kata-kata seperti "learning," "students," "media," dan "education" memiliki frekuensi kemunculan yang tinggi, menunjukkan fokus utama penelitian pada tema pembelajaran dan integrasi teknologi dalam pendidikan. Temuan ini diharapkan dapat memberikan wawasan yang lebih mendalam bagi peneliti dan praktisi dalam memahami tren penelitian serta merancang inovasi dalam pengembangan teknologi pendidikan.
Kata kunci: analisis frekuensi kata; *term frequency matrix; text mining*

Abstract. *This research aims to analyze the words that appear most frequently in several articles published by the Journal of Educational Technology using a term frequency matrix approach. Through text mining techniques, data from abstract articles is processed to identify key words and understand research patterns in the field of educational technology. The analysis was carried out on the last three editions of the journal, namely Vol. 7 No. 3, Vol. 7 No. 4, and Vol. 8 No. 1, by utilizing mathematical methods based on word frequency. The data is processed through the stages of preprocessing, tokenization, and creating a term frequency matrix, followed by descriptive statistical analysis and distribution modeling. The results showed that words such as "learning", "students", "media", and "education" had a high frequency of occurrence, indicating the main focus of the research on the theme of learning and the integration of technology in education. It is hoped that these findings can provide deeper insight for researchers and practitioners in understanding research trends and designing innovations in the development of educational technology.*
Keywords*: term frequency matrix; text mining; word frequency analysis.*

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PENDAHULUAN

Kemajuan teknologi digital telah membawa dampak signifikan dalam berbagai aspek kehidupan, termasuk di bidang pendidikan. Integrasi teknologi dalam pendidikan tidak hanya membantu dalam memfasilitasi proses pembelajaran, tetapi juga memainkan peran penting dalam meningkatkan kinerja dan keterampilan siswa. Jurnal Teknologi Pendidikan, yang diterbitkan oleh Universitas Pendidikan Ganesha, secara khusus mengangkat studi dan praktik etis dalam penggunaan teknologi untuk tujuan pendidikan dan pelatihan, dengan bekerja sama dengan Asosiasi Program Studi Teknologi Pendidikan Indonesia (APS-TPI). Penerbitan jurnal ini empat kali dalam setahun menunjukkan komitmen yang kuat untuk mendukung inovasi dan penelitian dalam bidang teknologi pendidikan.

Penelitian terkait penggunaan teknologi dalam pendidikan telah banyak dilakukan dalam dekade terakhir. Sebagai contoh, Abdelsamie et al. (2023) mengeksplorasi bagaimana teknologi digital dapat digunakan untuk meningkatkan keterampilan berpikir kritis siswa, sementara Liu et al. (2023) membahas implementasi modul e-learning berbasis Android yang dirancang untuk mahasiswa jurusan kuliner. Penelitian lainnya oleh Senave et al. (2023) menunjukkan efektivitas multimedia interaktif dalam meningkatkan hasil belajar siswa, dan Fuenteslópez et al. (2023) menyoroti peran media digital dalam pembelajaran.

Namun demikian, analisis mendalam terhadap tren dan tema utama dalam artikel-artikel jurnal teknologi pendidikan belum banyak dilakukan, sehingga meninggalkan celah yang perlu diisi oleh penelitian lebih lanjut. Salah satu pendekatan yang dapat digunakan adalah text mining dengan memanfaatkan term frequency matrix. Matriks ini digunakan untuk menghitung frekuensi kemunculan kata dalam teks, sehingga mempermudah identifikasi kata-kata kunci yang sering muncul serta pola distribusinya.

Penelitian ini bertujuan untuk menganalisis abstrak dari artikel yang diterbitkan pada tiga edisi terakhir Jurnal Teknologi Pendidikan, yaitu Vol. 7 No. 3, Vol. 7 No. 4, dan Vol. 8 No. 1. Melalui analisis berbasis term frequency matrix, penelitian ini diharapkan mampu memberikan wawasan tentang tren penelitian dalam teknologi pendidikan, seperti fokus utama pada tema pembelajaran, media digital, dan keterlibatan siswa. Dengan hasil ini, penelitian ini berkontribusi pada pengembangan strategi yang lebih efektif dalam penerapan teknologi pendidikan untuk meningkatkan kualitas pembelajaran.

METODE PENELITIAN

Penelitian ini menggunakan pendekatan kuantitatif untuk menganalisis teks abstrak dari artikel-artikel yang diterbitkan dalam tiga edisi terakhir Jurnal Teknologi Pendidikan. Data berupa abstrak dikumpulkan dari Vol. 7 No. 3, Vol. 7 No. 4, dan Vol. 8 No. 1, yang kemudian diproses menggunakan teknik statistik dan probabilistik. Pada tahap awal, dilakukan preprocessing teks untuk menghapus kata-kata umum (stop words), simbol, dan angka, serta melakukan tokenisasi untuk memecah teks menjadi kata-kata individu. Selanjutnya, data dikonversi ke dalam bentuk matriks frekuensi term (*term frequency matrix*), di mana setiap kata dihitung frekuensinya dalam dokumen tertentu menggunakan formula.

$$\boldsymbol{TF}_{i,j} = \frac{f_{i,j}}{\sum_k f_{k,j}}, \qquad (1)$$

dengan $f_{i,j}$ merepresentasikan jumlah kemunculan i dalam dokumen ke j.Data yang telah diproses dianalisis menggunakan beberapa metode matematika. Analisis statistik deskriptif digunakan untuk menghitung rata-rata, variansi, dan standar deviasi dari frekuensi kata, memberikan gambaran awal tentang distribusi data. Untuk mengidentifikasi pola distribusi kata, digunakan model distribusi Zipf, yang menggambarkan hubungan antara peringkat

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frekuensi kata dengan probabilitas kemunculannya. Selain itu, hubungan antar artikel dianalisis menggunakan cosine similarity, yang mengukur tingkat kesamaan antar teks berdasarkan nilai term frequency. Selanjutnya, untuk mengelompokkan artikel berdasarkan kemiripan tema, diterapkan metode K-Means Clustering, di mana artikel dikelompokkan ke dalam beberapa kluster berdasarkan jarak ke centroid masing-masing kluster.

HASIL DAN PEMBAHASAN

Beberapa artikel yang terbit pada tiga edisi terakhir jurnal teknologi Pendidikan terdapat pada Tabel 1, Tabel 2, dan Tabel 3.

Tabel 1. jurnal teknologi Pendidikan Vol. 8 No. 1 (2024)

Judul	Referensi
Digital Technologies: A Congregating pan-African Public Management on the Fourth Industrial Revolution for Employability and Sustainable Growth	(Atianashie et al., 2024)
Android Based E-Module on Food Services Subjects for Culinary Students	(Akmal et al., 2024)
The Impact of Technology Readiness on Undergraduate Students' Acceptance of Learning Management System	(Puspitasari & Maryani, 2024)
Digital Student Worksheets to Improving Students' Learning Independence	(Juliana et al., 2024)
The Future of Archives Learning with Technology: Exploring the Potential of Virtual Labs	(Ernawati & Sukmawati, 2024)
Bilingual E-Magazine: The Development of Digital Teaching Resource on Students' Literacy of Environmental Pollution	(Vonti et al., 2024)
English Reading E-Module Based on Gamification and Contextual Teaching and Learning to Promote Reading Comprehension Skills	(Utami & Drajati, 2024)
E-Modules for Computer Network Practicum Based on Problem-Based Learning and Peer Tutoring: A Practical Solution to Develop 21st-Century Skills	(Mursyida et al., 2024)
The Delone and McLean Information System Success Model: Investigating User Satisfaction in Learning Management System	(Widyaningrum et al., 2024)
The Impact of the Fuzzy Delphi Technique on Technology Methods Based on Design Thinking	(Daud et al., 2024)
The Impact of the Blended Learning Model on Student Learning Independence during the Learning Process	(Syarifudin et al., 2024)
Perceptions of Industry and Education Practitioners Regarding the	(Firdaus et al., 2024)

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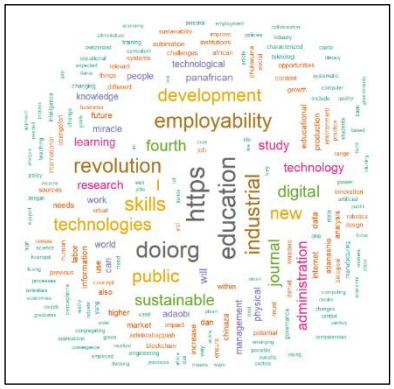
Implementation of Digital Learning in Automotive Engineering	
The Urgency of Android-Based Interactive Multimedia Development to Improve High School Students Collaboration Skills	(Pramusita & Suryono, 2024)
The Impact of Multimedia Elements on Tablets and Digital Stories in Learning Process Management	(Maulana et al., 2024)
Live Worksheets Media to Improve Exploration of Dance Movements of Grade II Elementary School Students	(Husnawati & Nurharini, 2024)
Elevating Student Motivation: Constructing a Gamified Massive Open Online Courses using the MARC Framework	(Saputro & Salam, 2024)
Asynchronous vs Synchronous: Effects of Online Learning on Students' Oral Presentation Skills	(Indriyani & Fendi, 2024)
Innovation in Vocational Learning: Project Based Learning E-Module on the Textile Dyeing Course	(Pratiwi & Nelmira, 2024)
E-Sistus: Electronic Information System for Students with Special Needs in Supporting Inclusive School Management	(Antari et al., 2024)
Multiple Intelligences-based Interactive Multimedia to Improve Students' Multiple Intelligences in Kindergarten	(Astiti et al., 2024)



(a)

(b)

Gambar 1. Analisis data mining pada artikel "Digital Technologies: A Congregating pan-African Public Management on the Fourth Industrial Revolution for Employability and Sustainable Growth".

Ditemukan 10 kata-kata yang paling banyak muncul pada masing-masing artikel yang dilakukan analisis data mining. Berdasarkan abstrak artikel "Digital Technologies: A Congregating pan-African Public Management on the Fourth Industrial Revolution for Employability and Sustainable Growth", kata yang paling sering muncul adalah https. Kata-kata tersebut muncul sebanyak 63 kali. Selanjutnya diikuti kata education dengan frekuensi

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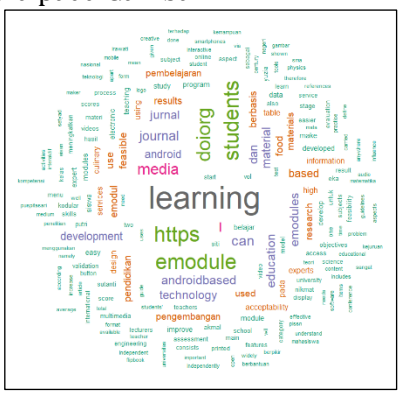
sebanyak 59 kali. Setelah itu, terdapat kata doiorg yang muncul sebanyak 56 kali. Lalu, terdapat kata employability yang muncul sebanyak 49 kali. Kemudian, terdapat kata industrial dan revolution yang muncul sebanyak 48 kali. Selanjutnya, terdapat kata skills yang muncul sebanyak 46 kali. Terakhir, terdapat kata public dan development yang muncul sebanyak 42 kali. Secara lengkap, analisis data mining pada artikel tersebut tersedia pada Gambar 1.



(a) (b)

Gambar 2. Analisis data mining pada artikel "Android Based E-Module on Food Services Subjects for Culinary Students".

Kami menemukan 10 kata-kata yang paling banyak muncul pada masing-masing artikel yang dilakukan analisis data mining. Berdasarkan abstrak artikel "Android Based E-Module on Food Services Subjects for Culinary Students", kata yang paling sering muncul adalah learning. Kata-kata tersebut muncul sebanyak 112 kali. Selanjutnya diikuti kata students dengan frekuensi sebanyak 70 kali. Setelah itu, terdapat kata https yang muncul sebanyak 69 kali. Lalu, terdapat kata emodule yang muncul sebanyak 68 kali. Kemudian, terdapat kata doirog yang muncul sebanyak 65 kali. Selanjutnya, terdapat kata media yang muncul sebanyak 49 kali. Setelah itu, ada kata can yang muncul sebanyak 42 kali. Lalu, ada kata journal yang muncul sebanyak 37 kali. Terakhir, terdapat kata education yang muncul sebanyak 35 kali. Secara lengkap, analisis data mining pada artikel tersebut tersedia pada Gambar 2.

Table 2. jurnal teknologi Pendidikan Vol. 7 No. 4 (2023)

Judul	Referensi
Early Childhood Board Games with School Objects and Anatomical Theme to Facilitate Learning	(Putra & Surjono, 2023)
Application of a Virtual Laboratory Containing Ethnoscience to Enhance Students' Critical Thinking Skills	(Sari et al., 2023)
Sound Wave Digital Learning Material Integrated Augmented Reality and CTL Model to Promote Students' 21st Century Skills	(Alfa, 2023)
Interactive Multimedia with Problem-Based Learning in Mathematics	(Harianto & Sudatha, 2023)

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Discovery Learning Model Optimizing Digital Thematic Multilingual Dictionary to Improve Literacy Skills	(Ratminingsih et al., 2023)
Micro Learning Media for Teaching English at Junior High School Students	(Nitiasih et al., 2023)
The Effect of Fruit Audio Aroma Media on Basic Science Process Skills in Elementary School	(Rohmatun et al., 2023)
Youtube Media in the Listening Ability of English Education Students	(Manihuruk & Nababan, 2023)
The Digital Literacy Instruments for University Students	(Fitroh et al., 2023)
Blog-Based Writing Instruction in Fostering EFL Writing Performance: Students' Belief and Attitudes	(Hartina et al., 2023)
LMS Implementation in High Schools in Eastern Indonesia After the Covid-19 Pandemic	(Yulianto & Layona, 2023)
Pre-Service Teachers' Perception of Digital Literacy	(Sudana et al., 2023)
Improving Student Interests and Learning Outcomes Using Project Based E-Learning Models	(Ariawan & Suartama, 2023)
Collaborative Project Based Blended Learning on Resilience and Student Learning Outcomes	(Sulastri & Agustini, 2023)
Interactive Media Articulate Storyline to Improving Students' Learning Outcomes on Traditional Engklek Games Material	(Milenia & Nurharini, 2023)
Examining the Roles of Self-Efficacy, Attitude and Self-Regulated Learning through Augmented Reality in Reading for EFL Learners	(Yulian et al., 2023)
Design of an Electronic Test for Geometry Material Based on Students' Numeracy Literacy and Metacognitive Knowledge	(Firmasari et al., 2023)
Needs Analysis: Development of Contextual Approach Learning Tools Based on Local Balinese Wisdom	(Wibawa et al., 2023)
Learning Media for Sound Picture Cards Based on E-Flashcard Quizlet Content for Elementary School IPAS Lessons	(Oktaviani & Isdaryanti, 2023)
Implementation of Mobile Learning Design in the Flipped Direct Instruction Model to	(Irfan et al., 2023)

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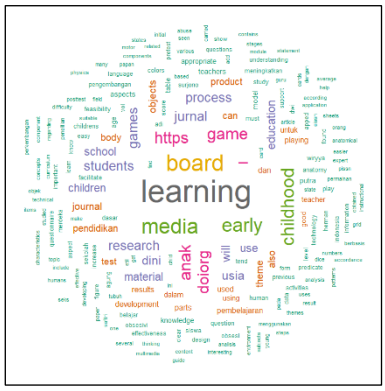
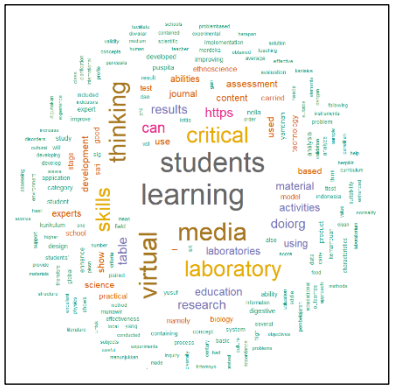
Increase Student Competency Using a Constructivist Approach



(a) (b)

Gambar 3. Analisis data mining pada artikel "Early Childhood Board Games with School Objects and Anatomical Theme to Facilitate Learning".

Kami menemukan 10 kata-kata yang paling banyak muncul pada masing-masing artikel yang dilakukan analisis data mining. Berdasarkan abstrak artikel "Early Childhood Board Games with School Objects and Anatomical Theme to Facilitate Learning", kata yang paling sering muncul adalah learning. Kata-kata tersebut muncul sebanyak 107 kali. Selanjutnya diikuti kata board dengan frekuensi sebanyak 74 kali. Setelah itu, terdapat kata media yang muncul sebanyak 66 kali. Lalu, terdapat kata early yang muncul sebanyak 62 kali. Kemudian, terdapat kata childhood yang muncul sebanyak 57 kali. Selanjutnya, terdapat kata anak dan game yang muncul sebanyak 51 kali. Setelah itu, ada kata https yang muncul sebanyak 49 kali. Terakhir, terdapat kata doirog yang muncul sebanyak 47 kali. Secara lengkap, analisis data mining pada artikel tersebut tersedia pada **Gambar 3**.



(a) (b)

Gambar 4. Analisis data mining pada artikel "Application of a Virtual Laboratory Containing Ethnoscience to Enhance Students' Critical Thinking Skills".

Kami menemukan 10 kata-kata yang paling banyak muncul pada masing-masing artikel yang dilakukan analisis data mining. Berdasarkan abstrak artikel "Application of a Virtual Laboratory Containing Ethnoscience to Enhance Students' Critical Thinking Skills", kata

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yang paling sering muncul adalah learning. Kata-kata tersebut muncul sebanyak 90 kali. Selanjutnya diikuti kata students dengan frekuensi sebanyak 85 kali. Setelah itu, terdapat kata virtual dan media yang muncul sebanyak 77 kali. Lalu, terdapat kata thinking yang muncul sebanyak 70 kali. Kemudian, terdapat kata critical yang muncul sebanyak 67 kali. Selanjutnya, terdapat kata laboratory yang muncul sebanyak 66 kali. Setelah itu, ada kata skills yang muncul sebanyak 60 kali. Lalu, ada kata can yang muncul sebanyak 40 kali. Terakhir, terdapat kata https yang muncul sebanyak 35 kali. Secara lengkap, analisis data mining pada artikel tersebut tersedia pada Gambar 4.

Tabel 3. jurnal teknologi Pendidikan Vol. 7 No. 3 (2023)

Judul	Referensi
The The Effectiveness of Virtual Reality in Mathematics for SPLDV Material	(Mahayani et al., 2023)
Interactive Mobile Learning-Based Gamification to Improve the Collaboration Skills of 11th Grade Students in High School	(Sujarwo & Rejekiningsih, 2023)
Trapezoid Multimedia with Visual Thinking Approach to Enhance Achievement of 7th Grade Students	(Suarsana, 2023)
Digital Game-Based Learning as a Strategy to Expand Vocational Students' Vocabulary: A Mixed Methods Approach	(Abidah et al., 2023)
Digital Teaching Module on Teaching Practice Material Based on Value Clarification Technique (VCT)	(Ratnaningsih & Jayanta, 2023)
Numeracy E-Module with Edugame As A Support For Mathematics Learning for Sixth-Grade Elementary School Students	(Sagita & Mulyani, 2023)
PERISA Audio Visual Media on Learning Social Diversity for Class V Elementary School Students	(Astuti et al., 2023)
Gender Differences in Teachers' Digital Literacy Skills in Teaching STEAM	(Adeoye, 2023)
Application of Multiple Representation-Based VIFOCA Problem Solving Strategies in Physics Learning	(Wirasti, 2023)
Contextual-Based Learning Videos for Sixth-Grade Elementary School Indonesian Language Content	(Yana & Sudarma, 2023)
Science Learning E-Module for Fourth Grade Elementary School Students	(Rianti & Simamora, 2023)
The Use of Technology-Based Formative Assessment in Improving Mathematics Achievement of Elementary School Students	(Rasmini et al., 2023)

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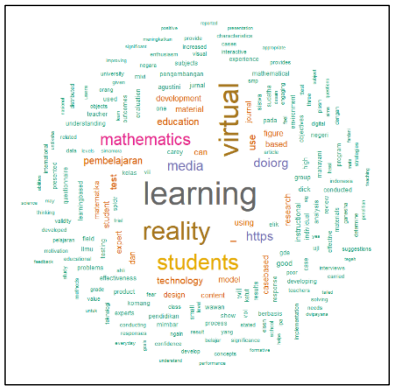
Audio-Visual Learning Media Based on Digital Literacy on the Topic of the Water Cycle	(Wulandari et al., 2023)
Addressing the Challenge of Mathematical Misconceptions: Development of Interactive Multimedia Based on Cognitive Conflict Strategy	(Winarso & Udin, 2023)
Infisdial as Learning Media for Strengthening "Anti Bullying" Attitudes	(Rahma & Al Rasyid, 2023)
Gamification of 2D and 3D Animation Subjects to Improve Learning Outcomes	(Setyaedhi, 2023)
Audio-Visual Based Picture Story Media for Elementary School Students	(Satriya & Fahyuni, 2023)
Digital Cognitive Behavior Modification Module to Reduce Cyberbullying Behavior	(Yusri & Karneli, 2023)
Powtoon-Based Animation Video to Improve Students' Learning Outcomes on Regional Artworks	(Setiawan & Soniya, 2023)
Using Multimedia Interactive Learning Informatics Materials in Junior High Schools on Increasing Students' Cognitive Abilities	(Anggara & Surjono, 2023)



(a) (b)

Gambar 5. Analisis data mining pada artikel "The The Effectiveness of Virtual Reality in Mathematics for SPLDV Material".

Kami menemukan 10 kata-kata yang paling banyak muncul pada masing-masing artikel yang dilakukan analisis data mining. Berdasarkan abstrak artikel "The The Effectiveness of Virtual Reality in Mathematics for SPLDV Material", kata yang paling sering muncul adalah learning. Kata-kata tersebut muncul sebanyak 133 kali. Selanjutnya diikuti kata virtual dengan frekuensi sebanyak 113 kali. Setelah itu, terdapat kata reality yang muncul sebanyak 105 kali. Lalu, terdapat kata students yang muncul sebanyak 85 kali. Kemudian, terdapat kata mathenatics yang muncul sebanyak 60 kali. Selanjutnya, terdapat kata media yang muncul sebanyak 43 kali. Setelah itu, ada kata https yang muncul sebanyak 42 kali. Lalu, ada kata doirog yang muncul sebanyak 40 kali. Terakhir, terdapat kata education yang

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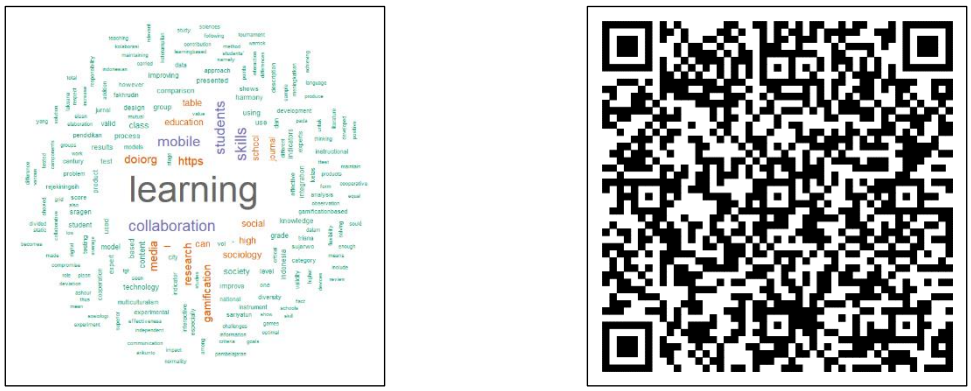
muncul sebanyak 29 kali. Secara lengkap, analisis data mining pada artikel tersebut tersedia pada Gambar 5.



(a) (b)

Gambar 6. Analisis data mining pada artikel “Interactive Mobile Learning-Based Gamification to Improve the Collaboration Skills of 11th Grade Students in High School”.

Kami menemukan 10 kata-kata yang paling banyak muncul pada masing-masing artikel yang dilakukan analisis data mining. Berdasarkan abstrak artikel “Interactive Mobile Learning-Based Gamification to Improve the Collaboration Skills of 11th Grade Students in High School”, kata yang paling sering muncul adalah learning. Kata-kata tersebut muncul sebanyak 235 kali. Selanjutnya diikuti kata colaboration dengan frekuensi sebanyak 79 kali. Setelah itu, terdapat kata skills yang muncul sebanyak 77 kali. Lalu, terdapat kata students yang muncul sebanyak 74 kali. Kemudian, terdapat kata mobile yang muncul sebanyak 73 kali. Selanjutnya, terdapat kata https yang muncul sebanyak 58 kali. Setelah itu, ada kata doirog yang muncul sebanyak 54 kali. Lalu, ada kata media yang muncul sebanyak 53. Terakhir, terdapat kata research yang muncul sebanyak 43 kali. Secara lengkap, analisis data mining pada artikel tersebut tersedia pada Gambar 6.

Kata "learning" memiliki frekuensi tertinggi, menandakan bahwa tema pembelajaran merupakan fokus utama dalam artikel-artikel tersebut. Kata-kata lain seperti "education", "media", dan "students" juga sering muncul, yang mengindikasikan bahwa penelitian dalam jurnal ini banyak membahas penggunaan teknologi dalam konteks pendidikan. Temuan ini mendukung hipotesis bahwa teknologi pendidikan berperan penting dalam proses pembelajaran, serta menunjukkan tren penggunaan teknologi digital dan mobile dalam pendidikan. Analisis ini sejalan dengan literatur sebelumnya yang menekankan manfaat teknologi dalam meningkatkan efektivitas dan keterlibatan dalam pembelajaran.

Berdasarkan temuan penelitian ini, ada beberapa saran yang dapat diberikan. Pertama, penelitian lebih lanjut dapat difokuskan pada tantangan dan hambatan dalam implementasi teknologi pendidikan, mengingat banyak penelitian yang juga menyoroti aspek ini. Hal ini penting untuk memberikan pandangan yang lebih komprehensif tentang penerapan teknologi dalam pendidikan. Kedua, pengembangan kurikulum dan metode pengajaran yang lebih inovatif dengan integrasi teknologi digital perlu terus didorong. Pendidik dan pembuat kebijakan diharapkan untuk mengadopsi teknologi seperti e-modules dan platform pembelajaran mobile secara lebih luas. Ketiga, penelitian lebih lanjut dapat mengeksplorasi dampak spesifik dari teknologi tertentu, seperti realitas virtual dan augmented reality, dalam konteks pembelajaran untuk memahami lebih dalam manfaat dan kendala penggunaannya. Dengan demikian, hasil penelitian ini diharapkan dapat

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memberikan kontribusi dalam pengembangan strategi pendidikan yang lebih efektif dan inovatif di masa mendatang.

DAFTAR PUSTAKA

Abidah, L., Asih, R. A., & Widodo, E. (2023). Digital Game-Based Learning as a Strategy to Expand Vocational Students' Vocabulary: A Mixed Methods Approach. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.64778

Adeoye, M. A. (2023). Gender Differences in Teachers' Digital Literacy Skills in Teaching STEAM. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.66847

Akmal, N., Putri, Y. E., & Sutanti, S. (2024). Android Based E-Module on Food Services Subjects for Culinary Students. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.70115

Alfa, J. (2023). Sound Wave Digital Learning Material Integrated Augmented Reality and CTL Model to Promote Students' 21st Century Skills. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.63479

Anggara, P. T., & Surjono, H. D. (2023). Using Multimedia Interactive Learning Informatics Materials in Junior High Schools on Increasing Students' Cognitive Abilities. *Journal of Education*, *7*(3), 572–580. https://doi.org/10.23887/jet.v7i3.64887

Antari, A. D. M., Agung, A. A. G., & Sulindawati, N. L. G. E. (2024). E-Sistus: Electronic Information System for Students with Special Needs in Supporting Inclusive School Management. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.73695

Ariawan, P. A., & Suartama, I. K. (2023). Improving Student Interests and Learning Outcomes Using Project Based E-Learning Models. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.64974

Astiti, P. J., Parwati, N. N., Tegeh, I. M., & Sudarma, I. K. (2024). Multiple Intelligences-based Interactive Multimedia to Improve Students' Multiple Intelligences in Kindergarten. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.73411

Astuti, K. M., Suarjana, I. M., & Trisna, G. A. P. S. (2023). PERISA Audio Visual Media on Learning Social Diversity for Class V Elementary School Students. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.62035

Atianashie, M., Adaobi, C. C., Adinkrah-Appiah, K., & Obeng-Ofori, D. (2024). Digital Technologies: A Congregating pan-African Public Management on the Fourth Industrial Revolution for Employability and Sustainable Growth. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.59267

Daud, A., Sitio, S. L. M., Bakri, A. A., & Judijanto, L. (2024). The Impact of the Fuzzy Delphi Technique on Technology Methods Based on Design Thinking. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.69185

Ernawati, Y. P. S., & Sukmawati, F. (2024). The Future of Archives Learning with Technology: Exploring the Potential of Virtual Labs. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.73815

Firdaus, M. D., Mutohhari, F., & Nurtanto, M. (2024). Perceptions of Industry and Education Practitioners Regarding the Implementation of Digital Learning in Automotive Engineering. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.55861

Firmasari, S., Raharjo, J. F., & Sundawan, M. D. (2023). Design of an Electronic Test for Geometry Material Based on Students' Numeracy Literacy and Metacognitive Knowledge. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.63608

Fitroh, I., Komalasari, K., & Ruhimat, M. (2023). The Digital Literacy Instruments for University Students. *Journal of Education Technology*, *7*(4).

Volume 3, No. 1, 2025, 15-28
ISSN 2963-9875 (Online)
ISSN 2964-2884 (Print)

https://doi.org/10.23887/jet.v7i4.67099

Harianto, N. A., & Sudatha, I. G. W. (2023). Interactive Multimedia with Problem-Based Learning in Mathematics. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.64656

Hartina, S., Safei, N., & Riani, N. T. (2023). Blog-Based Writing Instruction in Fostering EFL Writing Performance: Students' Belief and Attitudes. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.65968

Husnawati, R. N., & Nurharini, A. (2024). Live Worksheets Media to Improve Exploration of Dance Movements of Grade II Elementary School Students. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.75124

Indriyani, V., & Fendi, H. (2024). Asynchronous vs Synchronous: Effects of Online Learning on Students' Oral Presentation Skills. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.67113

Irfan, D., Mursyida, L., & Mubai, A. (2023). Implementation of Mobile Learning Design in the Flipped Direct Instruction Model to Increase Student Competency Using a Constructivist Approach. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.69768

Juliana, N., Ampera, D., & Sinukaban, V. Y. (2024). Digital Student Worksheets to Improving Students' Learning Independence. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.75433

Mahayani, K. E., Agustini, K., & Sudatha, I. G. W. (2023). The The Effectiveness of Virtual Reality in Mathematics for SPLDV Material. *Journal of Education Technology*, *7*(3), 390–399. https://doi.org/10.23887/jet.v7i3.62458

Manihuruk, L. M. E., & Nababan, I. A. (2023). Youtube Media in the Listening Ability of English Education Students. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.50843

Maulana, Y., Maulida, I. S., & Laratmase, A. J. (2024). The Impact of Multimedia Elements on Tablets and Digital Stories in Learning Process Management. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.71326

Milenia, R., & Nurharini, A. (2023). Interactive Media Articulate Storyline to Improving Students' Learning Outcomes on Traditional Engklek Games Material. *Journal of Education*, *7*(4), 707–714. https://doi.org/10.23887/jet.v7i4.69268

Mursyida, L., Dewi, I. P., Samala, A. D., & Ranuharja, F. (2024). E-Modules for Computer Network Practicum Based on Problem-Based Learning and Peer Tutoring: A Practical Solution to Develop 21st-Century Skills. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.63568

Nitiasih, P. K., Santosa, M. H., Suarcaya, P., & Ratnaya, G. (2023). Micro Learning Media for Teaching English at Junior High School Students. *Journal of Education*, *7*(4), 629–635. https://doi.org/10.23887/jet.v7i4.69627

Oktaviani, P., & Isdaryanti, B. (2023). Learning Media for Sound Picture Cards Based on E-Flashcard Quizlet Content for Elementary School IPAS Lessons. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.69680

Pramusita, M. K. A., & Suryono, H. (2024). The Urgency of Android-Based Interactive Multimedia Development to Improve High School Students Collaboration Skills. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.75278

Pratiwi, M. M., & Nelmira, W. (2024). Innovation in Vocational Learning: Project Based Learning E-Module on the Textile Dyeing Course. *Journal of Education Technology*, *8*(1), 175–184. https://doi.org/10.23887/jet.v8i1.74954

Puspitasari, Y. M., & Maryani, I. (2024). The Impact of Technology Readiness on Undergraduate Students' Acceptance of Learning Management System. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.51989

Volume 3, No. 1, 2025, 15-28
ISSN 2963-9875 (Online)
ISSN 2964-2884 (Print)

Putra, A. A. A. W., & Surjono, H. D. (2023). Early Childhood Board Games with School Objects and Anatomical Theme to Facilitate Learning. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.67384

Rahma, Z., & Al Rasyid, M. (2023). Infisdial as Learning Media for Strengthening" Anti Bullying" Attitudes. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.66252

Rasmini, N. W., Antara, P. A., & Wulandari, I. G. A. A. M. (2023). The Use of Technology-Based Formative Assessment in Improving Mathematics Achievement of Elementary School Students. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.67770

Ratminingsih, N. M., Budasi, I. G., Santosa, M. H., Padmadewi, N. N., Artini, L. P., & Purandina, I. P. Y. (2023). Discovery Learning Model Optimizing Digital Thematic Multilingual Dictionary to Improve Literacy Skills. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.67155

Ratnaningsih, M. N. C., & Jayanta, I. N. L. (2023). Digital Teaching Module on Teaching Practice Material Based on Value Clarification Technique (VCT). *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.61649

Rianti, O., & Simamora, A. H. (2023). Science Learning E-Module for Fourth Grade Elementary School Students. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.64276

Rohmatun, I. N., Atmojo, I. R. W., & Yulisetiani, S. (2023). The Effect of Fruit Audio Aroma Media on Basic Science Process Skills in Elementary School. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.61666

Sagita, M., & Mulyani, P. K. (2023). Numeracy E-Module with Edugame As A Support For Mathematics Learning for Sixth-Grade Elementary School Students. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.65920

Saputro, R. E., & Salam, S. (2024). Elevating Student Motivation: Constructing a Gamified Massive Open Online Courses using the MARC Framework. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.67624

Sari, N. P., Yusuf, M., & Yamtinah, S. (2023). Application of a Virtual Laboratory Containing Ethnoscience to Enhance Students' Critical Thinking Skills. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.68713

Satriya, R. R., & Fahyuni, E. F. (2023). Audio-Visual Based Picture Story Media for Elementary School Students. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.69409

Setiawan, D., & Soniya, E. (2023). Powtoon-Based Animation Video to Improve Students' Learning Outcomes on Regional Artworks. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.60599

Setyaedhi, H. S. (2023). Gamification of 2D and 3D Animation Subjects to Improve Learning Outcomes. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.67288

Suarsana, I. M. (2023). Trapezoid Multimedia with Visual Thinking Approach to Enhance Achievement of 7th Grade Students. *Journal of Education Technology*, *7*(3), 411–418. https://doi.org/10.23887/jet.v7i3.63158

Sudana, P. A. P., Santosa, M. H., Ratminingsih, N. M., Padmadewi, N. N., Adnyani, L. P. S., & Artini, L. P. (2023). Pre-Service Teachers' Perception of Digital Literacy. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.68867

Sujarwo, F., & Rejekiningsih, T. (2023). Interactive Mobile Learning-Based Gamification to Improve the Collaboration Skills of 11th Grade Students in High School. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.63210

Sulastri, I. A., & Agustini, K. (2023). Collaborative Project Based Blended Learning on Resilience and Student Learning Outcomes. *Journal of Education Technology*, *7*(3).

Volume 3, No. 1, 2025, 15-28
ISSN 2963-9875 (Online)
ISSN 2964-2884 (Print)

https://doi.org/10.23887/jet.v7i4.60417

Syarifudin, A., Sanulita, H., Hajati, E. N., & Lumbantoruan, J. H. (2024). The Impact of the Blended Learning Model on Student Learning Independence during the Learning Process. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.69311

Utami, I. A., & Drajati, N. A. (2024). English Reading E-Module Based on Gamification and Contextual Teaching and Learning to Promote Reading Comprehension Skills. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.74569

Vonti, L. H., Ganeswara, M. G., Rahmah, M., & Rosyid, A. (2024). Bilingual E-Magazine: The Development of Digital Teaching Resource on Students' Literacy of Environmental Pollution. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.68115

Wibawa, I. M. C., Margunayasa, I. G., & Widiastini, N. W. E. (2023). Needs Analysis: Development of Contextual Approach Learning Tools Based on Local Balinese Wisdom. *Journal of Education Technology*, *7*(4), 734–741. https://doi.org/10.23887/jet.v7i4.69933

Widyaningrum, T., Sholihah, Q., & Haryono, B. S. (2024). The Delone and McLean Information System Success Model: Investigating User Satisfaction in Learning Management System. *Journal of Education Technology*, *8*(1). https://doi.org/10.23887/jet.v8i1.71080

Winarso, W., & Udin, T. (2023). Addressing the Challenge of Mathematical Misconceptions: Development of Interactive Multimedia Based on Cognitive Conflict Strategy. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.63037

Wirasti, R. A. M. K. (2023). Application of Multiple Representation-Based VIFOCA Problem Solving Strategies in Physics Learning. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.67055

Wulandari, K. S., Parmiti, D. P., & Wibawa, I. M. C. (2023). Audio-Visual Learning Media Based on Digital Literacy on the Topic of the Water Cycle. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.64228

Yana, N. L. E., & Sudarma, I. K. (2023). Contextual-Based Learning Videos for Sixth-Grade Elementary School Indonesian Language Content. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.64968

Yulian, R., Yuniarti, Y., & Sirat, O. M. (2023). The Examining the Roles of Self-Efficacy, Attitude and Self-Regulated Learning through Augmented Reality in Reading for EFL Learners. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.64567

Yulianto, B., & Layona, R. (2023). LMS Implementation in High Schools in Eastern Indonesia After the Covid-19 Pandemic. *Journal of Education Technology*, *7*(4). https://doi.org/10.23887/jet.v7i4.66171

Yusri, N. F., & Karneli, Y. (2023). Digital Cognitive Behavior Modification Module to Reduce Cyberbullying Behavior. *Journal of Education Technology*, *7*(3). https://doi.org/10.23887/jet.v7i3.70031