JUSTEK : JURNAL SAINS DAN TEKNOLOGI
http://journal.ummat.ac.id/index.php/justek
ISSN 2620-5475
Vol. 9, No. 1, March 2026, pp. 55-64

Exploring The Final-Year Undergraduate Research Related to TikTok, Study Motivation, and Data Mining: A Bibliometric Study

Sulidar Fitri[1], Panyaporn Prangjarote[2], Nilubon Kurubanjerdjit[3]
[1]Department of Information Technology Education, Faculty of Teacher Training and Education, Unviersitas Muhammadiyah Tasikmalaya, Kota Tasikmalaya, Indonesia
[2]Department of Computational Science and Digital Technology, Kasetsart University, Thailand
[3]Department of Digital Technology, Mae Fah Luang University, Thailand
[1]sfitri@umtas.ac.id, [2]panyaporn.p@ku.th, [3]nilubon.kur@mfu.ac.th

ARTICLE INFO

Article History:

Received : 08-12-2025
Revised : 14-03-2026
Accepted : 18-03-2026
Online : 25-03-2026

Keywords:
Bibliometric;
Tiktok;
Data Mining;
Student Motivation;
Undergraduate.

ABSTRACT

TikTok, as a short video-based platform, is now widely used by students to find learning motivation through content such as study tips, time management, and thesis experiences. This study aims to map the scientific literature that examines the relationship between TikTok, learning motivation, and data mining techniques in the context of final year students. The method used is bibliometric analysis with the Scopus database, covering publications between 2019 and 2025. The results showed a significant increase in publication trends in the last three years. India, the United States and China were recorded as the countries with the highest contributions on this topic. Articles with the highest citations tended to address the integration of learning technologies, the use of data mining, and the influence of social media on academic performance. Co-occurrence analysis revealed nine major thematic clusters that show close interrelationships between keywords such as student motivation, academic performance, and educational data mining. This research contributes to understanding the scientific landscape of TikTok utilization in supporting learning motivation and offers further research directions.

A. INTRODUCTION

The process of completing a final project or thesis represents one of the most demanding stages in higher education. Final-year students frequently experience high levels of academic pressure due to multiple factors such as financial limitations, bureaucratic procedures, and restricted access to research resources. These conditions contribute to academic fatigue and may hinder the successful completion of a thesis (Senyametor et al., 2022). Furthermore, previous studies indicate that academic stress and anxiety significantly affect students' mental health and academic motivation (Sun et al., 2021; Yaramapu et al., 2024). When academic pressure is prolonged, it may even increase the risk of students withdrawing from their studies or dropping out of university (Labrague et al., 2025).

In response to these challenges, students increasingly turn to digital platforms as alternative coping mechanisms. Social media platforms have evolved beyond entertainment and now function as informal learning environments that support students' academic routines and psychological well-being. Platforms such as TikTok host

a growing number of educational and motivational contents, including "study with me" videos that simulate shared learning environments and promote productivity. These types of content provide social support, create a sense of community among learners, and help students manage their study time more effectively (Ibtasar et al., 2022; Manic, 2024). Additionally, students use TikTok to share academic experiences, find learning strategies, and gain motivation from peers facing similar academic struggles (Anser & Ullah, 2025).

Despite the increasing use of TikTok for academic purposes, understanding how such digital interactions influence student motivation requires systematic analytical approaches. Data mining techniques offer the ability to analyse large-scale behavioural data and identify patterns in students' digital learning activities. In the educational context, data mining has been used to analyse learning behaviour, academic engagement, and motivational factors that influence students' academic outcomes (Dou et al., 2023; Khan et al., 2023). By extracting patterns from digital interaction data, researchers can better understand the attributes that shape learning motivation in online environments (Islam et al., 2019).

Recent studies have explored several aspects related to digital learning environments, social media usage, and data-driven educational analysis. For example, TikTok has been recognized as a platform capable of delivering short, engaging, and motivational learning content that can influence students' study habits and productivity (Gao et al., 2023). several studies have investigated the role of digital communities and "study with me" content in creating virtual learning companionship. Such content provides a sense of social presence and collective learning that can enhance students' motivation and reduce feelings of isolation during independent study (Abdelghaffar & Eid, 2025; Gazit, 2023; Hou et al., 2025). Meanwhile, research in the field of educational data mining has focused on identifying behavioural patterns in digital learning environments (Hasan et al., 2020; Rabelo et al., 2023; Ting et al., 2024).

However, most existing studies tend to focus on these topics separately. Research on TikTok mainly examines its role as a learning media or social platform, while studies on educational data mining focus on analysing learning data from learning management systems or academic databases (Caballero et al., 2023; Silva-Filho et al., 2025). Similarly, investigations into student motivation often emphasize psychological factors without integrating insights from digital behaviour analytics (Qushem et al., 2021; Yunita et al., 2022; Zea et al., 2021). As a result, there is still limited research that combines the perspectives of social media learning, student motivation, and data mining-based analysis within a comprehensive bibliometric mapping.

Furthermore, existing educational data mining research typically focuses on structured educational data such as learning management system logs, academic records, or online course interactions (Andre et al., 2023; Li et al., 2018; Safitri et al., 2022). The use of bibliometric methods to explore the intersection of social media platforms like TikTok, learning motivation, and data mining techniques remains relatively unexplored. This indicates an opportunity to expand the understanding of how digital learning environments are being studied in the academic community.

Therefore, this research seeks to fill this gap by conducting a bibliometric analysis that integrates these themes within a single scientific mapping framework. By analysing publications indexed in Scopus, this study identifies research trends, thematic clusters, and collaboration patterns related to TikTok, learning motivation, and data mining in the context of final-year students. Through this approach, the study provides a comprehensive overview of existing knowledge while highlighting emerging research opportunities in the field of digital learning and educational analytics.

Investigating the intersection between TikTok usage, learning motivation, and data mining analysis becomes increasingly important to provide insights into emerging digital learning behaviours among final-year students. The urgency of this research lies in the need to systematically map and understand this phenomenon to support the development of more adaptive and technology-based learning strategies in higher education.

B. METHODS

This study adopts a bibliometric approach to evaluate scholarly publications that address the topics of TikTok and academic motivation in university students. Bibliometrics is a method that utilizes statistical techniques in analysing scientific literature such as books, articles, and other publications (Erümit et al., 2024). This approach is useful in compiling a thorough literature review as well as in uncovering development trends in a particular field of study (Hallinger & Kovačević, 2022). In addition, bibliometric analysis can also be used to identify research directions and opportunities that have not been widely explored (Mulay et al., 2020).

The paper research workflow shown in figure 1, this research uses the Scopus database with journal searches based on the similarity of keywords, titles, or abstracts. The keywords used mainly refer to "Tiktok", "study", "data mining," "undergraduate". The form of scopus keywords used TITLE-ABS-KEY (("data mining" OR "data analysis") AND ("Tiktok" OR "social media" OR "social network" OR "online platform" OR "digital communication") AND ("text mining" OR "sentiment analysis" OR "user behaviour") AND ("algorithm" OR "technique" OR "method" OR "approach") AND ("big data" OR "data set" OR "data source" OR "data analytics") AND ("study" OR "student" OR "education" OR "thesis")). The search filter used the 2019-2025 publishing time limit with subject areas focusing on computer science, engineering, social science, arts and humanities. The search results found 358 documents.

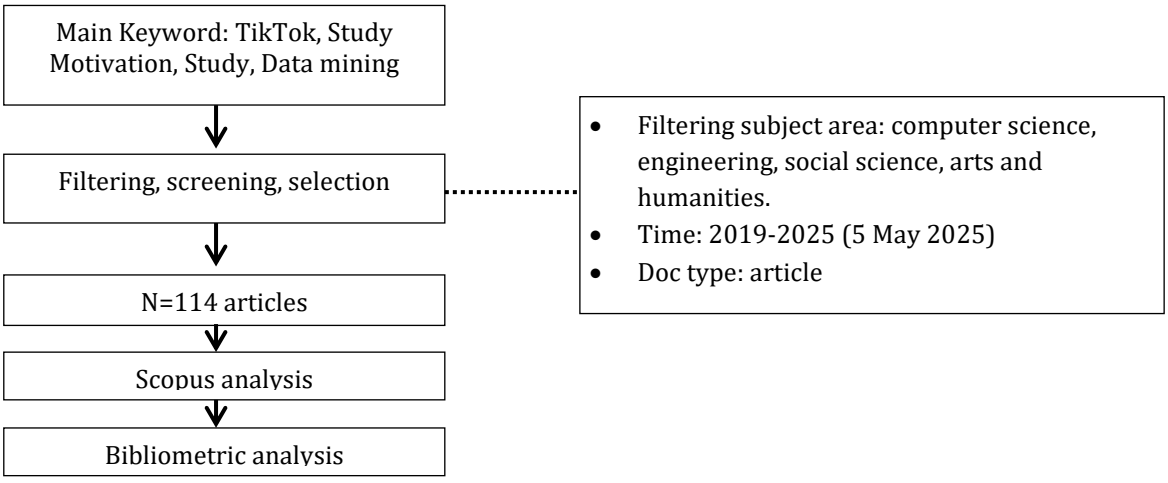

Figure 1. Workflow for paper search

Through screening the titles of the number of documents found, not all can be considered relevant. So the search was expanded with several keywords (tiktok AND undergraduate) and (students' AND performance AND prediction AND social AND media). The expansion of the journal search also depends on the title of the journal which is considered the most relevant to the topic of this bibliometric research and then searches for related journals based on the Scopus database. As a result, the number of journals used in this bibliometric research is 114 articles. Processing is assisted by

Microsoft excel on simple statistical processing and vos viewer to observe the relationship between keywords (co-occurrence) and journal topics found.

C. RESULT AND DISCUSSION

1. Result

Based on the search and selection of relevant articles, a number of publications were analyzed based on bibliometric metrics such as publication trends per year, number of citations, most prolific authors, most active countries and institutions, and most frequent keywords. These results are interpreted to understand how scholarly attention to this topic is evolving, as well as the extent to which TikTok is positioned as a potential tool in supporting students' academic motivation, particularly those completing their final project.

Figure 2 shows the number of scientific articles on the topics of TikTok, students, and data mining published between 2019 and 2025. It can be seen that there is an increasing trend in the number of publications from year to year, especially after 2021. At the beginning of the period (2019), the number of publications was relatively low, only 7 articles. This figure increased slightly in 2020 (8 articles) and 2021 (10 articles), reflecting the limited initial interest in this topic. A significant increase began in 2022, with 18 articles, which then continued to increase to 25 articles in 2023 and peaked in 2024 with 28 articles. This suggests that the topic of TikTok in the context of learning motivation and data mining utilization is gaining increasing attention in the academic community, possibly due to the post-pandemic shift in digital learning patterns and the increasing popularity of TikTok among students.

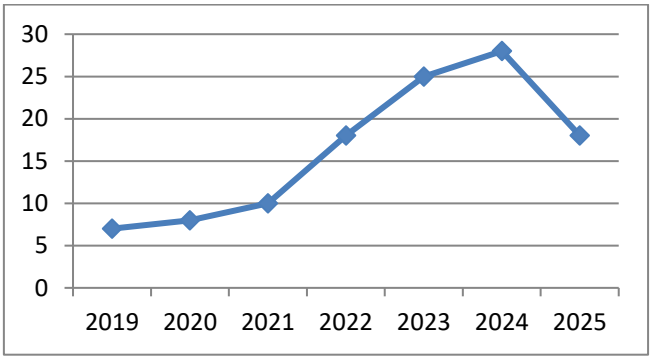

Figure 2. Number of articles on TikTok, student and data mining published between 2019 and 2025 (5 may, 2025)

However, by 2025, there is a noticeable decrease to 18 articles. This drop could be due to various factors such as a shift in research interest to other platforms, or perhaps because the year was not yet fully underway when the data was collected (cut-off time). Overall, the trend shows significant growth in the related literature, especially in the 2022-2024 timeframe. This reflects that the topic of TikTok and student motivation, particularly from a data mining perspective, is becoming an increasingly relevant and interesting area for scientific study.

Table 1 shows the ten scholarly articles with the highest number of citations that address the topics of TikTok, college students, and data mining, either directly or in relevant contexts such as academic performance, social media, and data analysis techniques. The most cited article is by Bach et al. (2019) entitled "Text mining for big data analysis in financial sector: A literature review", published in the journal Sustainability (Switzerland) with a total of 151 citations. Although the focus is on the financial sector, this article is important because it discusses text mining methods that are

widely adopted in the fields of education and social media analysis. The article by Evers et al. (2020) received 74 citations and discussed the impact of social media use on sleep disturbance, academic burnout and student performance. This suggests a close link between the use of digital platforms such as TikTok and students' mental health. Ramaswami et al. (2019) who applied educational data mining for academic performance prediction (46 citations), as well as Shen et al. (2020) and Roberts & David (2021) who combined machine learning and digital media in the context of mental health and social behavior.

The article that directly discusses TikTok in the context of education is Radin & Light (2022) with the title "TikTok: An Emergent Opportunity for Teaching and Learning Science Communication Online" which received 30 citations. Although it is not the highest-cited article, it is one of the few studies that explicitly makes TikTok the object of analysis in education. Most of the high-citation articles used machine learning, data mining, and social media approaches in the context of mental health, academic prediction, and scientific communication. This suggests that the study of TikTok, students' learning motivation, and data mining techniques is still evolving and requires more exploration, especially in the context of its use to increase the academic motivation of final-year students.

Table 1. The most cited articles with keyword of TikTok, student and data mining

Authors	Title	Source title	Cited by
Pejić Bach., et al, (2019)	Text mining for big data analysis in financial sector: A literature review (Pejić Bach et al., 2019)	Sustainability (Switzerland)	151
Evers K.,et al, (2020)	Investigating the relation among disturbed sleep due to social media use, school burnout, and academic performance (Evers et al., 2020)	Journal of Adolescence	74
Akella A.P.,et al, (2021)	Early indicators of scientific impact: Predicting citations with altmetrics (Akella et al., 2021)	Journal of Informetrics	65
Ramaswami G.,et al, (2019)	Using educational data mining techniques to increase the prediction accuracy of student academic performance (Ramaswami et al., 2019)	Information and Learning Science	46
Shen Y.,et al, (2020)	Detecting risk of suicide attempts among Chinese medical college students using a machine learning algorithm (Shen et al., 2020)	Journal of Affective Disorders	37
Roberts J.A. & David M.E. (2021)	Improving predictions of COVID-19 preventive behavior: Development of a sequential mediation model (Roberts & David, 2021)	Journal of Medical Internet Research	37
Nti I.K.,et al, (2022)	Prediction of social media effects on students' academic performance using Machine Learning Algorithms (MLAs) (Nti et al., 2022)	Journal of Computers in Education	32
Radin A.G.B.& Light C.J. (2022)	TikTok: An Emergent Opportunity for Teaching and Learning Science Communication Online (Radin & Light, 2022)	Journal of Microbiology and Biology Education	30

Authors	Title	Source title	Cited by
Wu C.,et al, (2021)	Improving prediction of real-time loneliness and companionship type using geosocial features of personal smartphone data (Wu et al., 2021)	Smart Health	27
Manikandan S. & Chinnadurai M. (2020)	Evaluation of students' performance in educational sciences and prediction of future development using tensorflow (Manikandan & Chinnadurai, 2020)	International Journal of Engineering Education	23

Visualization shown in figure 3 mapping the co-occurrence keywords using 114 articles resulted in 49 items with 9 clusters. There were 384 unique keywords listed in the analysed documents. However, after applying the minimum two occurrences threshold criteria, there were only 50 keywords that qualified for further analysis. Of these 50 keywords, 49 keywords were selected based on their total link strength with other keywords. The general direction and centre of research interest in this topic is the relationship between TikTok, student academic motivation, and data mining approaches.

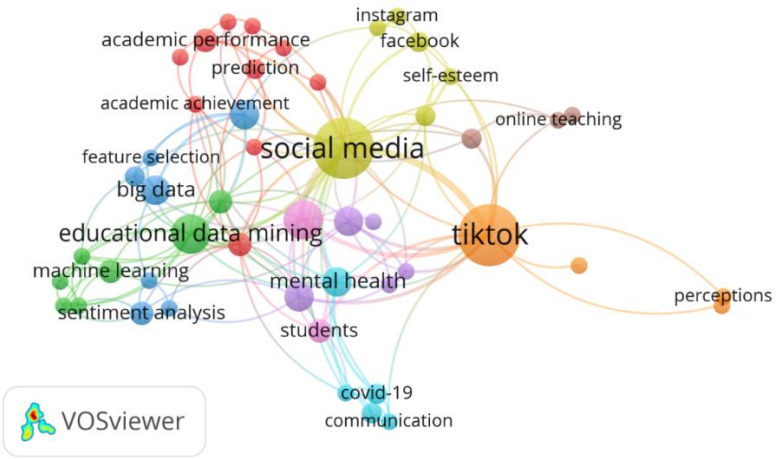

Figure 1. Co-occurrance keywords meeting the criteria of minimum two co-occurrences

2. Discussion

Based on the results of the co-occurrence keywords visualization using VOSviewer, the keywords TikTok and social media appear as the two most prominent nodes in the network map. Both are interconnected with many other keywords, suggesting that research on TikTok is often linked to the broader context of social media. This indicates that these two keywords are a dominant focus in the literature on the topic of social media use in academic and student contexts. TikTok keywords are closely linked to terms such as mental health, communication, students, and perceptions, suggesting that the platform is often studied in relation to students' psychological states, ways of communicating, and users' perceptions of its content. On the other hand, social media keywords are widely connected to other concepts such as academic performance, educational data mining, and self-esteem, indicating that social media in general is considered to have a significant impact on learning, emotional state, and academic achievement.

Furthermore, the network structure reveals nine interconnected thematic clusters that represent the spectrum of approaches in this research. For example, the green cluster highlights technical aspects through the linkages between educational data

mining, machine learning, and sentiment analysis, indicating the use of computational approaches to analyze the influence of social media on education. The purple and red clusters illustrate attention to the psychological aspects and academic performance of students, such as mental health, academic performance, and prediction. The orange cluster, led by the keyword TikTok, illustrates the connection with the perception and utilization of this platform in online education

Nine thematic clusters. The main clusters include keywords such as "student motivation", "academic performance", "educational data mining", "machine learning", and "TikTok", which represent an interdisciplinary research focus that combines educational psychology approaches, digital learning technologies, and analysis of student behavior through data mining. This reflects that technical and analytical approaches to educational data, including the use of machine learning algorithms, are widely utilized to evaluate the impact of social media in academic contexts. Therefore, future research can be directed towards the utilization of data mining and sentiment analysis of TikTok content to identify content patterns that influence student motivation, especially those who are completing a thesis.

In addition to the bibliometric findings visualized through keyword co-occurrence mapping, the dynamic relationship between TikTok use and learning motivation shows increasingly complex theoretical development. Recent studies indicate that TikTok content consumption patterns play a role in mediating attention, self-regulation, and students' learning strategies, particularly in the context of academic workload faced by final-year students. Manic (2024) reported that exposure to short, educational videos can enhance perceived academic support while reducing academic procrastination (Manic, 2024). This aligns with the clustering of keywords such as student motivation, mental health, and engagement in the network map, suggesting that digital content can shape adaptive learning behaviours when designed according to students' academic needs.

On the other hand, data mining approaches further reinforce understanding of how students' interactions with TikTok relate to academic performance. Studies by Nti et al. (2022) demonstrate that machine learning–based predictive algorithms can identify declining motivation through digital behaviour patterns, including app usage duration, frequency of accessing specific content, and emotional responses detected via sentiment analysis (Nti et al., 2022). These findings support the bibliometric mapping results that show strong linkages between clusters on educational data mining, prediction, and social media analytics. Thus, data mining integrates not only descriptive interpretation but also offers potential predictive models capable of identifying risks of academic fatigue or motivational decline at an early stage.

The bibliometric results also highlight the need to broaden research directions toward intervention-based approaches using digital platforms. Recent publications emphasize that social media–based interventions—including TikTok as a micro-learning tool—can significantly enhance students' task value, self-efficacy, and learning persistence (Anser & Ullah, 2025; Astiwardhani & A. Sobandi, 2024). This aligns with inter-cluster associations that connect TikTok to communication, perception, and academic performance. Therefore, future studies may explore the development of pedagogical models that leverage TikTok content strategically—not only as an informative medium but also as an adaptive learning resource, such as through personalized learning pathways or content recommendations powered by data mining techniques. Such approaches have strong potential to increase motivation, reduce academic stress, and accelerate thesis completion among final-year students.

D. CONCLUSION AND SUGGESTIONS

This study reveals significantly growing research trends related to the topics of TikTok, student learning motivation, and data mining over the period 2019 to 2025. The increase in the number of publications shows that these topics are attracting the attention of academics, especially from 2022 to 2024, which recorded the highest number of articles. Geographically, India, the United States, and China were the top three countries contributing the most publications, indicating that the issue is receiving widespread attention from various regions with diverse research approaches. In addition, the most cited articles tend to come from studies that combine data mining techniques and digital learning, suggesting that the integration of technology in education and the influence of social media on academic performance are highly relevant issues.

The keyword co-occurrence visualization results show a close relationship between keywords such as "student motivation", "academic performance", "educational data mining", and "TikTok", which form nine thematic clusters. This reflects that research in this area has developed in a multidisciplinary manner, spanning the fields of education, psychology, information technology, and digital communication. This study not only fills a gap in the literature on the role of TikTok in the academic context, but also opens up opportunities for further research on how educational content on TikTok can be strategically utilized to increase the learning motivation of final-year students, especially in completing their thesis or final project.

REFERENCES

Abdelghaffar, A., & Eid, L. (2025). A Critical Look at Equity in International Doctoral Education at a Distance: A Duo's Journey. *British Journal of Educational Technology*, *56*(2), 834–851. https://doi.org/10.1111/bjet.13566

Akella, A. P., Alhoori, H., Kondamudi, P. R., Freeman, C., & Zhou, H. (2021). Early indicators of scientific impact: Predicting citations with altmetrics. *Journal of Informetrics*, *15*(2), 101128. https://doi.org/10.1016/j.joi.2020.101128

Andre, A., Suciati, N., Fabroyir, H., & Pardede, E. (2023). Educational Data Mining Clustering Approach: Case Study of Undergraduate Student Thesis Topic. *Ieee Access*, *11*, 130072–130088. https://doi.org/10.1109/access.2023.3332818

Anser, S., & Ullah, F. (2025). The Impact of TikTok on Academic Life of University Students. *Journal of Political Stability Archive*, *3*(2), 800–814. https://doi.org/10.63468/jpsa.3.2.46

Astiwardhani, W., & A. Sobandi. (2024). Transforming Educational Paradigms: How Micro Learning Shapes Student Understanding, Retention, and Motivation? *Journal of Education Action Research*, *8*(2), 300–309. https://doi.org/10.23887/jear.v8i2.77711

Bulley, B. K., Tirumala, S., Mahamkali, B. S., Sakib, M. N., Ahmed, S., & Dey, S. (2024). *The Dual Role of Student and Creator: Exploring the TikTok Experience* (pp. 635–641). https://dl.acm.org/doi/10.1145/3678884.3681918

Caballero, D. C., Castillo, C. A., Ballesteros-Yáñez, I., Jiménez, B. R., & Juárez, L. M. (2023). Microlearning Through TikTok in Higher Education. An Evaluation of Uses and Potentials. *Education and Information Technologies*, *29*(2), 2365–2385. https://doi.org/10.1007/s10639-023-11904-4

Dou, H., Chen, J., & Zhou, J. (2023). *Research on the application of data mining in the analysis of students' behavioral intelligence in the information age* (pp. 859–864). https://dl.acm.org/doi/10.1145/3660043.3660195

Erümit, A. K., Cebeci, H. Y., & Özmen, S. (2024). Big Data in Higher Education: Bibliometric Analysis. *TechTrends*, *68*(6), 1129–1139. https://doi.org/10.1007/s11528-024-01006-4

Evers, K., Chen, S., Rothmann, S., Dhir, A., & Pallesen, S. (2020). Investigating the relation among disturbed sleep due to social media use, school burnout, and academic performance. *Journal of Adolescence*, *84*(1), 156–164. https://doi.org/10.1016/j.adolescence.2020.08.011

Gao, S.-Y., Tsai, Y.-Y., Huang, J.-H., Ma, Y.-X., & Wu, T.-L. (2023). TikTok for developing learning

motivation and oral proficiency in MICE learners. *Journal of Hospitality, Leisure, Sport and Tourism Education*, *32*. https://doi.org/10.1016/j.jhlste.2022.100415

Gazit, T. (2023). "For Students Shall Not Live by Zoom Alone": Psychological Factors Explaining the Engagement of Students During the COVID-19. *Information and Learning Sciences*, *125*(7/8), 545–564. https://doi.org/10.1108/ils-02-2023-0019

Hallinger, P., & Kovačević, J. (2022). Applying bibliometric review methods in education: Rationale, definitions, analytical techniques, and illustrations. In *International Encyclopedia of Education: Fourth Edition* (pp. 546–556). https://doi.org/10.1016/B978-0-12-818630-5.05070-3

Hasan, R., Palaniappan, S., Mahmood, S., Abbas, A. H., Sarker, K. U., & Sattar, M. U. (2020). Predicting Student Performance in Higher Educational Institutions Using Video Learning Analytics and Data Mining Techniques. *Applied Sciences*, *10*(11), 3894. https://doi.org/10.3390/app10113894

Hidayat, A., Adi, K., & Surarso, B. (2023). Prediction of Various Computational Parameters using Naive Bayes and Felder and Silverman Methods. *International Journal of Intelligent Systems and Applications in Engineering*, *11*(4s), 434–443. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85160776715&partnerID=40&md5=2d7d5cf7c8b0e0bdf28fcc8c78a849fe

Hou, R., Jin, L., He, J., & Wang, J. (2025). Peer Support and Learning Outcomes in "Study With Me" Among Generation Z College Students: Mediating Roles of Motivation, Test Anxiety, and Self-Efficacy. *Frontiers in Psychology*, *16*. https://doi.org/10.3389/fpsyg.2025.1582857

Ibtasar, R., Heineke, C. M., & Michaelis, J. E. (2022). *"With You I'll be Able to Actually Learn Everything": Exploring Learner Experiences With a "Study With Me" Video* (pp. 203–210). https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145777147&partnerID=40&md5=fc0e03a159488284587dd5bd80c0f49f

Islam, O., Siddiqui, M., & Aljohani, N. R. (2019). *Identifying online profiles of distance learning students using data mining techniques* (pp. 115–120). https://doi.org/10.1145/3369199.3369249

Khan, M., Naz, S., Khan, Y., Zafar, M., Khan, M., & Pau, G. (2023). Utilizing Machine Learning Models to Predict Student Performance from LMS Activity Logs. *IEEE Access*, *11*, 86953–86962. https://doi.org/10.1109/ACCESS.2023.3305276

Labrague, L. J., Rosales, R. A., Arteche, D. L., Santos, M. C., Calimbas, N. D. L., Yboa, B. C., Sabio, J. B., Quiña, C. R., Quiño, L. Q., & Apacible, M. A. (2025). How academic pressure drives dropout intentions: The mediating roles of life satisfaction and stress in nursing students. *Teaching and Learning in Nursing*, *20*(1), 61–68. https://doi.org/10.1016/j.teln.2024.11.006

Lee, S., Park, H., & Choi, J. (2023). Short-form educational videos and student engagement: Understanding motivational pathways in digital learning. *Computers & Education*, *196*, 104695.

Li, H., Gobert, J. D., Graesser, A., & Dickler, R. (2018). Advanced Educational Technology for Science Inquiry Assessment. *Policy Insights From the Behavioral and Brain Sciences*, *5*(2), 171–178. https://doi.org/10.1177/2372732218790017

Manic, M. (2024). Short-Form Video Content and Consumer Engagement in Digital Landscapes. *Bulletin of the Transilvania University of Brasov. Series V: Economic Sciences*, 45–52. https://doi.org/10.31926/but.es.2024.17.66.1.4

Manikandan, S., & Chinnadurai, M. (2020). Evaluation of students' performance in educational sciences and prediction of future development using tensorflow. *International Journal of Engineering Education*, *36*(6), 1783–1790. https://www.ijee.ie/1atestissues/Vol36-6/07_ijee3988.pdf

Mulay, P., Joshi, R. R., & Chaudhari, A. (2020). Bibliometric study of bibliometric papers about clustering. *Library Philosophy and Practice*, *1*(1), 1–22. https://digitalcommons.unl.edu/libphilprac/4211/

Nti, I. K., Akyeramfo-Sam, S., Bediako-Kyeremeh, B., & Agyemang, S. (2022). Prediction of social media effects on students' academic performance using Machine Learning Algorithms (MLAs). *Journal of Computers in Education*, *9*(2), 195–223. https://doi.org/10.1007/s40692-

021-00201-z

Pejić Bach, M., Krstić, Ž., Seljan, S., & Turulja, L. (2019). Text Mining for Big Data Analysis in Financial Sector: A Literature Review. *Sustainability*, *11*(5), 1277. https://doi.org/10.3390/su11051277

Qushem, U. B., Christopoulos, A., Oyelere, S. S., Ogata, H., & Laakso, M. (2021). Multimodal Technologies in Precision Education: Providing New Opportunities or Adding More Challenges? *Education Sciences*, *11*(7), 338. https://doi.org/10.3390/educsci11070338

Rabelo, A., Rodrigues, M. W., Nobre, C. N., Isotani, S., & Zárate, L. E. (2023). Educational Data Mining and Learning Analytics: A Review of Educational Management in E-Learning. *Information Discovery and Delivery*, *52*(2), 149–163. https://doi.org/10.1108/idd-10-2022-0099

Radin, A. G. B., & Light, C. J. (2022). TikTok: An Emergent Opportunity for Teaching and Learning Science Communication Online. *Journal of Microbiology & Biology Education*, *23*(1). https://doi.org/10.1128/jmbe.00236-21

Ramaswami, G., Susnjak, T., Mathrani, A., Lim, J., & Garcia, P. (2019). Using educational data mining techniques to increase the prediction accuracy of student academic performance. *Information and Learning Science*, *120*(7–8), 451–467. https://doi.org/10.1108/ILS-03-2019-0017

Roberts, J. A., & David, M. E. (2021). Improving Predictions of COVID-19 Preventive Behavior: Development of a Sequential Mediation Model. *Journal of Medical Internet Research*, *23*(3), e23218. https://doi.org/10.2196/23218

Safitri, S. N., Setiadi, H., & Suryani, E. (2022). Educational Data Mining Using Cluster Analysis Methods and Decision Trees Based on Log Mining. *Jurnal Resti (Rekayasa Sistem Dan Teknologi Informasi)*, *6*(3), 448–456. https://doi.org/10.29207/resti.v6i3.3935

Senyametor, F., Abreh, M. K., Domaley, V., Mills, C. A., & Ahorsu-Walker, J. (2022). Determinants of Postgraduate Thesis Completion: Do Academic Stress and Burnout Play a Role? *Africa Education Review*, *19*(4–6), 73–95. https://doi.org/10.1080/18146627.2024.2311885

Shen, Y., Zhang, W., Chan, B. S. M., Zhang, Y., Meng, F., Kennon, E. A., Wu, H. E., Luo, X., & Zhang, X. (2020). Detecting risk of suicide attempts among Chinese medical college students using a machine learning algorithm. *Journal of Affective Disorders*, *273*, 18–23. https://doi.org/10.1016/j.jad.2020.04.057

Silva-Filho, E., Silva, T. C. de L. A. da, Di-Bonaventura, S., Vieira, L. A. F., Pegado, R., & Micussi, M. T. A. B. C. (2025). Investigating TikTok Trends in Transcranial Direct Current Stimulation: A Comprehensive Descriptive Analysis. *The Clinical Teacher*, *22*(2). https://doi.org/10.1111/tct.70067

Sun, F.-K., Phil, A. L. D., Chiang, C.-Y., Yang, C.-J., & Lu, C.-Y. (2021). Nursing graduates' lived experiences of anxiety during their final year at University. *Nurse Education Today*, *96*. https://doi.org/10.1016/j.nedt.2020.104614

Ting, C. K., Ibrahim, N., Huspi, S. H., & Kadir, W. M. N. W. (2024). Multidimensional Context Clustering to Analyse Student Engagement in Online Learning Environment. *International Journal of Innovative Computing*, *14*(2), 89–96. https://doi.org/10.11113/ijic.v14n2.487

Wu, C., Barczyk, A. N., Craddock, R. C., Harari, G. M., Thomaz, E., Shumake, J. D., Beevers, C. G., Gosling, S. D., & Schnyer, D. M. (2021). Improving prediction of real-time loneliness and companionship type using geosocial features of personal smartphone data. *Smart Health*, *20*, 100180. https://doi.org/10.1016/j.smhl.2021.100180

Yaramapu, K., Anumula, L., Chinni, S. K., Prasanth, P. S., Govula, K., & Reddy, S. S. (2024). Stress and Its Downside among Medical and Dental Students: A Questionnaire-based Study. *Journal of Interdisciplinary Dentistry*, *14*(2), 73–78. https://doi.org/10.4103/jid.jid_77_23

Yunita, A., Santoso, H. B., & Hasibuan, Z. A. (2022). Finding Contributing Factors of Students' Academic Achievement Using Quantitative and Qualitative Analyses-Based Information Extraction. *International Journal of Emerging Technologies in Learning (Ijet)*, *17*(16), 108–125. https://doi.org/10.3991/ijet.v17i16.31945

Zea, E., Valez-Balderas, M., & Uribe-Quevedo, Á. (2021). *Serious Games and Multiple Intelligences for Customized Learning: A Discussion*. 177–189. https://doi.org/10.1007/978-3-030-59608-8_9