Research Article

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Student Dropout: A Bibliometric Analysis of Influencing Factors Using VOS Viewer to Explore Trends, Impact, and Collaborative Patterns

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Abstract

This article presents a bibliometric review of academic research on student dropout. The aim is to identify trends, evaluate the impact of publications, and examine collaboration patterns within this field. The SCOPUS database is utilized to identify and classify the most relevant research based on journals, articles, authors, institutions, and countries. Additionally, VOSviewer software is employed to map the bibliographic material, using co-citations and keyword co-occurrence for scientific mapping. The results indicate a significant increase in the number of publications over a 10-year period, reflecting a growing interest in the topic. Citation analysis reveals that certain key articles have had a substantial impact, being frequently cited in subsequent work. It is also observed that researchers with publications in Q1 and Q2 ranked journals have made significant contributions to the literature, marking a strong influence in the field. In terms of collaboration, there is an increase in international partnerships, with a growing number of publications co-authored by researchers from different countries. Leading institutions in student dropout research include universities in the United States, Europe, and Latin America, noted for their high scientific output and influence on the topic. This bibliometric analysis not only provides a detailed view of trends and the impact of research on student dropout but also highlights the importance of international collaboration in advancing knowledge in this field.

Keywords: *Student Dropout, Bibliometric Analysis, Scientific Production*

1. Introduction

Student dropout is a persistent issue in higher education that affects students, educational institutions, and society at large. This phenomenon, which extends beyond the simple definition of students leaving their studies before obtaining their degree, is complex and multifaceted. Particularly, it is a problem influenced by mental disorders as well as suicidal thoughts and behaviors, which are highly prevalent among college students (Mortier et al., 2015).

Research on student dropout has expanded to include a wider range of factors, incorporating both theoretical and empirical studies that examine socioeconomic, individual, institutional, and academic variables. Although the definition of dropout remains debated, there is consensus that these variables significantly impact student attrition. These studies highlight the importance of social and academic integration as a key determinant for retention.

In this context, the literature frequently examines student dropout at various stages (early versus late) and its diverse consequences. Dropout has significant repercussions at the social level, such as socioeconomic impacts; at the university level, including funding, performance, and other academic factors; and at the personal level (Mortier et al., 2015). Therefore, educational institutions, as part of society, face the challenge of incorporating the latest scientific and technological advancements to improve their effectiveness. Additionally, the efficiency of the educational system is assessed by its ability to retain students and enable them to complete their studies without delays or dropout (Hauer et al., 2020b). Consequently, student dropout serves as an indicator of a crisis in the educational sphere, questioning the quality of processes and programs offered by higher education institutions.

This article addresses the problem of school dropout through a bibliometric analysis, aiming to answer the question: What factors have been identified as contributors to student dropout in the academic literature, and which are perceived as the most influential based on scientific databases? The research problem focuses on how to determine the factors influencing student dropout.

This article examines the issue of school dropout through a bibliometric analysis to identify contributing factors to student dropout in the academic literature and their impact according to scientific databases. The research focuses on determining which factors influence student dropout and how these factors are perceived in the existing literature. The paper is structured into several sections: Section 1 presents the results of the bibliometric analysis, revealing risk factors identified in the literature, such as socioeconomic aspects (lack of financial resources and parental educational level), academic factors (low academic performance and lack of institutional support), and psychological variables (motivation and stress). Demographic characteristics, such as gender and ethnicity, are also highlighted as influential in student dropout. Section 2 describes the methodology used, which includes a bibliometric analysis of articles indexed in SCOPUS, using VOSviewer software to detect patterns, trends, and emerging topics related to school dropout.

2. Literature Review

Early research on student dropout was grounded in Durkheim's (1897, cited in Edumadze & Govender, 2024) suicide theory, which provided a theoretical framework on the relationship between social integration and student dropout. Durkheim proposed that a lack of social integration could have significant negative consequences, an idea that influenced the study of student dropout developed by various authors (Van Eck & Waltman, 2009). According to Tinto (1987, cited in Angelaina & Jimoyiannis, 2012), dropouts primarily occur due to a lack of integration both in the social environment and within the university community. Additionally, Tinto (1993) notes that students tend to stay in school if they develop an identity with the institution, highlighting the importance of determining whether students are achieving this institutional connection.

Researchers have developed models that distinguish between expulsion factors, which are internal to the university or chosen career, and attraction factors, which are external, such as job offers or economic problems. These models integrate pre-university, intra-university, and external

decision-making factors, enriching the understanding of the elements influencing student dropout. Major contributors to this theoretical framework include Heublein et al. (2003, 2010), Larsen (2000), Ulriksen et al. (2010), Bound and Turner (2011), Farrell and Brunton (2020), and Palmer et al. (2017), who have provided a more comprehensive and nuanced view of the determinants of student dropout.

Early studies on student dropout, predominantly longitudinal and qualitative, focused on social integration and external factors related to dropout. Kumagai and Lypson (2009) and Stegers-Jager et al. (2012) highlighted the influence of individual and contextual factors on student retention. Schonrock-Adema et al. (2012) and Esmail & Roberts (2013) examined how academic characteristics and institutional support affect persistence in studies. Dinos et al. (2017) and Sagasser et al. (2017) added dimensions related to adaptation and student engagement. Wusu et al. (2019) and Abel & Cohen (2019) focused on the socioeconomic implications of dropout. Goodyear & Carvalho (2019) and Bullock et al. (2020) explored the impact of teaching quality and pedagogical support. Diaz et al. (2020) and Roberts & Belonging (2020) addressed the relevance of course content and emotional support. Jones et al. (2021) and Jabbarpour & Westfall (2021) studied the influence of external factors and changes in the educational environment. Van Moppes et al. (2023), Netherlands (2022), and Chi (2023) have provided recent data on current trends and challenges in student retention.Several of these studies cover different stages and their diverse consequences, reflecting significant impacts at social, university, and personal levels. Socially, dropout implies socioeconomic repercussions, while at the university level it affects aspects such as funding, performance, and other academic factors (Mortier et al., 2015). A lack of connection with the university community and the perception of a poor educational experience can increase the likelihood of dropout. It is crucial that policies and intervention strategies focus on these risk factors to reduce dropout and improve retention (Tinto, 2006). According to Bedi (2023), the situation worsens when dropout affects international students who have left their home country to study abroad.

Therefore, educational institutions must adopt scientific and technological advancements to enhance their effectiveness and demonstrate their ability to retain students (Hauer et al., 2020b). Thus, student dropout has become an indicator of an educational crisis, questioning the quality of processes and programs offered and reflecting deficiencies in teacher preparation, methodological differences, issues in program articulation, socioeconomic factors, and career selection (Angelaina & Jimoyiannis, 2012; Spady, 1970, cited in Brydon-Miller & Maguire, 2009). On the other hand, Van Eck and Waltman (2009) mention that economic difficulties and lack of institutional support are identified as critical factors that can lead to dropout or transfer, while Giovagnoli (2002) asserts that perceptions about course relevance and teaching quality play a crucial role in the decision to continue or change programs. Additionally, dropout impacts the relationship between the state and educational institutions, as well as family dynamics, often exacerbated by racial discrimination (Esmail & Roberts, 2013; Diaz et al., 2019).

From a statistical perspective, dropout is assessed through the dropout rate, in contrast to the retention rate or graduation rate, which indicate positive outcomes (Heublein, Spangenberg, & Sommer, 2010). Dropout can be voluntary, as when a student transfers to another university, changes their career, or decides to leave the institution to accept a job offer. On the other hand, it can also be forced by economic factors, personal problems, or family circumstances (Andrade et al., 2021; Zainal, 2023). Student dropout is a complex issue that affects institutional, social, and family levels. It is currently perceived as an institutional phenomenon associated with low academic performance and forced withdrawal of students, causing financial instability and affecting goals and social policies. Several recent studies have shown that a high percentage of students do not complete their university studies, leading to a significant social cost (Wusu et al., 2019; Thakrar & Bhupatkar, 2022; Sihare, 2024b). Major obstacles include the lack of relevance of course content, insufficient instructional support, decreased student confidence, and external factors such as family and socioeconomic problems. Additionally, dependence on outdated teaching methods may limit the effectiveness of online learning (Farrell & Brunton, 2020; Palmer et al., 2017).

In context, student dropout is a complex phenomenon analyzed from various perspectives, such

as psychology, which focuses on individual aspects, while sociology examines contextual variables, such as family and social environment (Himmel, 2002). Various models and theories classify dropout factors into categories such as academic preparation, psychological aspects, and family and socioeconomic characteristics (Schonrock-Adema et al., 2012; Sagasser et al., 2016; Matheu et al., 2018; Sihare, 2024). Recent research has revealed that a significant number of students do not complete their university studies due to a combination of factors. These include the lack of relevance of course content, insufficient instructional support, and external issues, such as family and socioeconomic problems, which affect student engagement and generate a considerable social cost (Liu et al., 2013; Wusu et al., 2019; Farrell & Brunton, 2020; Thakrar & Bhupatkar, 2022; Sihare, 2024b). Dependence on outdated teaching methods may also limit the effectiveness of educational materials. However, the integration of interactive tools in virtual classrooms presents a promising solution to improve engagement in online learning (Bedi, 2023; Palmer et al., 2017). Other studies, such as those by Heublein, Spangenberg, and Sommer (2010), Bound and Turner (2011), Larsen (2000), and Ulriksen et al. (2010), expanded existing models to include pre-university and intra-university factors, highlighting the importance of social and academic integration for student retention.

The examined research groups personal factors into categories such as academic preparation, psychological aspects, and family and socioeconomic characteristics (Himmel, 2002; Schonrock-Adema et al., 2012; Sagasser et al., 2016; Matheu et al., 2018; Sihare, 2024). Abel et al. (2023) group factors into estimates about international migration flows, while Jabbarpour et al. (2021) examined diversity in family medicine. Stegers-Jager et al. (2012) studied ethnic disparities in academic performance, and Van Moppes et al. (2023) analyzed the risk of low performance among medical learners. Additionally, Esmail et al. (2018) investigated the performance of ethnic minority candidates, and Jones et al. (2019) addressed the racial gap in medical education. Bullock et al. (2021) and Diaz et al. (2020) contributed to understanding the impact of stereotypes and institutional strategies for inclusion. The review also included Roberts et al. (2021) and Karnieli-Miller et al. (2020), who grouped factors into the sense of belonging and professionalism in students, as well as Sagasser et al. (2018) and Goodyear et al. (2021), who analyzed self-regulated learning and complex learning environments. Other authors such as Chevalier et al. (2022) and Bozalek et al. (2020) offered perspectives on participatory techniques in education, while Fernandez (2020) and Mays et al. (2022) provided approaches on the implementation of public health strategies and the quality of qualitative research. Based on these contributions, determinant factors of student dropout have been identified and are presented in Figure 1.

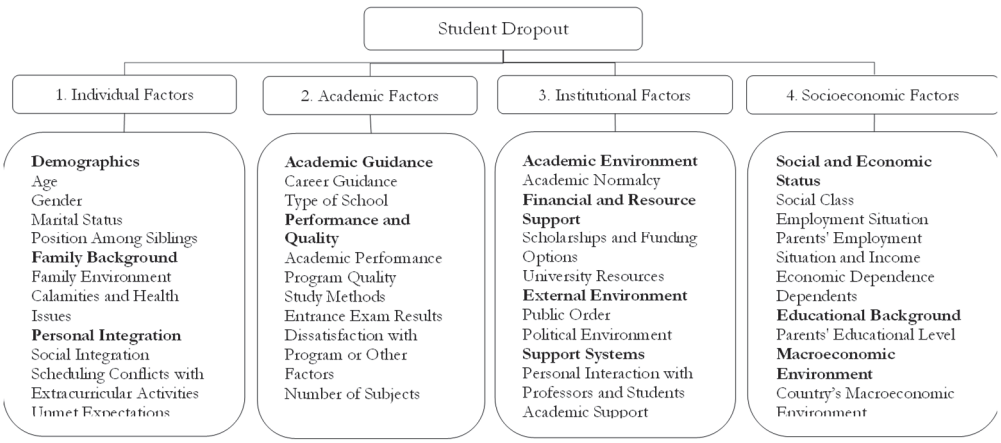


Figure 1. Mapping of co-citation of journals.

This figure illustrates the main influences affecting the phenomenon of student dropout. Among these factors, key aspects include individual factors, academic and social environment, economic difficulties, institutional integration, and academic and emotional support. Below is a more detailed literature review on the factors influencing student dropout:

Holzer, J., Grützmacher, L., Lüftenegger, M., Prenzel, M., & Schober, B. (2024). This study investigates the relationship between teachers' emotions (joy, anger, anxiety), their instructional behavior, and students' school well-being in primary schools in Austria. A total of 1,550 students and 134 teachers from 50 disadvantaged schools participated. The results indicate that teachers' joy is positively related to their instructional behavior, while anger and anxiety have negative effects, particularly on classroom management. Interestingly, it was observed that teachers' anger was positively associated with students' intrinsic motivation, suggesting the need to revisit established theories on teacher emotions and their impact on learning.

Blanco-Varela, B., Amoedo, J. M., & Sánchez-Carreira, M. C. (2024). This article explores ability grouping in secondary schools in Spain and its relationship with socio-educational vulnerability. Using data from the PISA assessment and propensity score matching methodology, it was found that ability grouping may hinder opportunities for academically disadvantaged students. The results suggest that this approach could increase inequalities rather than mitigate them, raising questions about the effectiveness of educational policies in promoting equitable opportunities.

Kroupova, K., Havranek, T., & Irsova, Z. (2024). This meta-analysis examines the relationship between student employment and educational outcomes, based on 69 studies. The authors conclude that the effects of employment on education are generally negative, but of low magnitude. Additionally, it was found that the decision to drop out of school was more influenced by employment than by overall academic performance. Through advanced statistical methods, the study suggests that the negative findings in the literature may be driven by publication biases and endogeneity.

Craven, R. G., Marsh, H. W., Yeung, A. S., Vasconcellos, D., Dillon, A., Ryan, R. M., Mooney, J., Franklin, A., Barclay, L., & van Westenbrugge, A. (2024). This article presents the development of the Multidimensional Student Well-Being (MSW) instrument and its application in a sample of 1,405 Australian students. Six domains of well-being were identified, which remained consistent across different demographic groups, highlighting the importance of a multidimensional approach to understanding well-being in the school context. Additionally, a downward trend in well-being over time was observed, underscoring the need for interventions that promote healthy development among students.

David Litalien, István Tóth-Király, Frédéric Guay, and Alexandre J.S. Morin (2024) analyze the motivation profiles of PhD students from the perspective of self-determination theory in their study published in Contemporary Educational Psychology. Using a sample of 1,060 Canadian students, they identified four motivational profiles. The research reveals that need satisfaction and perceived support from teachers are key factors predicting membership in these profiles. The High Self-Determination profile is associated with the best outcomes in terms of persistence, satisfaction, future intentions, and academic performance. Additionally, the authors found that the profiles and their relationships with predictors and outcomes are consistent across different student subgroups, suggesting that motivational characteristics are universally relevant. Based on these findings, they propose intervention strategies focused on fostering students' autonomy to improve their motivational configurations and, ultimately, their academic experience and program completion rates.

ham Xuan Lam, Phan Quoc Hung Mai, Quang Hung Nguyen, Thao Pham, Thi Hong Hanh Nguyen, and Thi Huyen Nguyen (2024). Improving educational assessment through predictive modeling of student evaluation. This study evaluates various machine learning models to predict student performance, using data from 253 undergraduate students from an interactive learning management system. A predictive model was trained to forecast grades based on participation patterns and time spent on exercises. Five base classifiers and an ensemble learning method called

Stacking Classifier were compared, with the latter demonstrating higher accuracy in predicting grade rankings. The research suggests that integrating data-driven forecasts into the educational environment can transform teaching methodologies and provide educators with objective insights to assess student performance.

3. Methodology and Materials

This document employs a bibliometric method, which involves the quantitative and qualitative analysis of literary data using statistical tools to evaluate research outcomes from individuals, organizations, and countries. This approach provides insights into the current state of research in a particular field and helps identify new research directions efficiently. Additionally, charts and visual effects are used to complement the analysis, making the results more comprehensible and comprehensive.

Search Strategies.

This study is based on bibliographic records obtained from Scopus, a database recognized for its adherence to rigorous quality standards and its importance in the search and evaluation of academic publications (González et al., 2024; Wang et al., 2024). To validate the results, VOSviewer, a specialized software tool for visualizing and analyzing bibliographic networks, is used (Van Eck & Waltman, 2009b; Ding & Yang, 2020; Aria & Cuccurullo, 2017; Donthu et al., 2021; Van Eck & Waltman, 2010; Zupic & Čater, 2015). Given the complexity of the student dropout phenomenon, the analysis models show variations in focus and emphasis.

To select and classify academic publications from SCOPUS, criteria such as thematic relevance, document type, time limitations, and language are applied, prioritizing peer-reviewed and recent studies. Exclusion criteria eliminate irrelevant, duplicate, or low-impact journal articles (Table 1, Table 2). To assess the impact of the publications, metrics such as SCOPUS quartiles (Q1-Q4), the H-index, number of citations, Scimago Journal Rank (SJR), and Altmetrics, which measure visibility in non-traditional media, are used.

Table 1: Exclusion Criteria for Publications in the Field of Student Dropout

Criterion	Description
Inclusion Criteria	
Thematic Relevance	Articles directly related to the topic of interest (education, inclusion, dropout).
Time Range	Recent publications (2014 to 2024).
Document Type	Peer-reviewed articles, systematic reviews, empirical studies.
Exclusion Criteria	
Off-topic	Articles that mention the topic without delving into the central focus.
Duplicate Articles	Publications that are duplicates or already included from other sources.
Low-impact Journals	Articles from journals ranked low or outside the top quartiles of SCOPUS
Evaluation Metrics	
SCOPUS Quartiles (Q1–Q4)	Preference for articles from journals ranked in Q1 and Q2 due to their prestige and academic impact..
H-index	An indicator of the productivity and impact of an author or journal, where a high H-index reflects significant influence.
SJR (Scimago Journal Rank)	Citations are weighted based on the importance of the citing sources.

Table 2: Main Publications (2014-2024) in the Field of Student Dropout

Author	**Title of the Article**	**Journal**	**Journal Ranking**
Abel G.J. et al.	Bilateral international migration flow estimates for 200 countries	Scientific Data	**(Nature Publishing Group)**
Netherlands S.	How many people immigrate to the Netherlands?	Web page	-
Jabbarpour Y. et al.	Diversity in the Family Medicine workforce	Family Medicine	**Q2**
Wusu M.H. et al.	Matching our mission: a Strategic Plan to create a Diverse Family Medicine Residency	Family Medicine	**Q2**
Dinos S. et al.	Assessing explanatory models and health beliefs: an essential but overlooked competency for clinicians	BJPsych Advances	**Q3**
Stegers-Jager K. et al.	Ethnic disparities in undergraduate pre-clinical and clinical performance	Medical Education	**Q1**

Author	Title of the Article	Journal	Journal Ranking
van Moppes N.M. et al.	Ethnic minority GP trainees at risk for underperformance assessments: a quantitative cohort study	BJGP Open	Q3
Esmail A. et al.	Academic performance of ethnic minority candidates and discrimination in the MRCGP examinations	BMJ (Clinical Research ed)	Q1
Jones A.C. et al.	Admissions is not enough: the racial achievement gap in Medical Education	Academic Medicine	Q1
Bullock J.L. et al.	They Don't See a Lot of People My Color: A Mixed Methods Study of Racial/Ethnic Stereotype Threat Among Medical Students	Academic Medicine	Q1
Diaz T. et al.	An Institutional Approach to fostering inclusion and addressing racial Bias: implications for diversity in Academic Medicine	Teaching and Learning in Medicine	Q2
Roberts L. et al.	Belonging R., Inclusion	Academic Medicine	Q1
Karnieli-Miller O. et al.	Medical students' professionalism narratives: a window on the informal and hidden curriculum	Academic Medicine	Q1
Sagasser M. et al.	Self-entrustment: How trainees' self-regulated learning supports participation in the workplace	Advances in Health Sciences Education: Theory & Practice	Q2
Schonrock-Adema J. et al.	Key Elements in Assessing the Educational Environment: Where is the Theory?	Advances in Health Sciences Education: Theory & Practice	Q2
Goodyear P. et al.	The Analysis of Complex Learning Environments	Educational Technology & Society	Q2
Kumagai A.K. et al.	Beyond cultural competence: critical consciousness, social justice, and multicultural education	Academic Medicine	Q1
Brydon-Miller M. et al.	Participatory action research: contributions to the development of practitioner inquiry in education	Educational Action Research	Q2
Chevalier J. et al.	Participatory Action Research, Theory and Methods for Engaged Inquiry	Participatory Action Research	Q2
Bozalek V. et al.	Exploring power and privilege using participatory learning and action techniques	Social Work Education	Q3
de Brun T. et al.	Using Participatory Learning & Action (PLA) research techniques for inter-stakeholder dialogue in primary healthcare	Research Involvement and Engagement	Q2
Allaham S. et al.	Participatory learning and action (PLA) to improve health outcomes in high-income settings: a systematic review protocol	BMJ Open	Q2
Ukowitz M. et al.	Who defines innovation in education? Participatory action research and organisational learning	Educational Action Research	Q2
Smith D. et al.	Building equity: Policies and practices to empower all learners	ASCD	Q2
Maslow A.H.	Motivation and personality	Harper & Row	Q3
Carter P. et al.	Teaching diverse learners	Handbook of Research on Teaching	Q3
Severiens S. et al.	Study success of students from ethnic minority backgrounds: An overview of explanations for differences in study careers	Routledge International Handbook of Higher Education	Q2
Voogt J. et al.	Speaking up, support, control and work engagement of medical residents. A structural equation modelling analysis	Medical Education	Q1
Gay G. et al.	Culturally responsive teaching: Theory, research, and practice	Teachers College	Q2
Wensing M. et al.	Knowledge translation in health: how implementation science could contribute more	BMC Medicine	Q2
Fernandez M.E. et al.	Implementation mapping: using intervention mapping to develop implementation strategies	Frontiers in Public Health	Q2
Mays N. et al.	Qualitative research in health care. Assessing quality in qualitative research	BMJ	Q1
Cordeiro L. et al.	Action research methodology in the health care field: a scoping review protocol	JBI Database Systematic Reviews & Implementation Reports	Q2
Akman H. et al.	Co-creating Value in Online Innovation communities	European Journal of Marketing	Q2
Fernandez A. et al.	Academic Leadership in a time of Crisis: The coronavirus and COVID-19	Journal of Leadership Studies	Q3
Taylor B. et al.	Can rapid approaches to qualitative analysis deliver timely, valid findings to clinical leaders?	BMJ Open	Q2
Brown-Johnson C. et al.	The Stanford Lightning Report Method: a comparison of rapid qualitative synthesis results across four implementation evaluations	Learn Health Systems	Q2
Lewinski A.A. et al.	Applied Rapid Qualitative Analysis to develop a contextually appropriate intervention and increase the likelihood of Uptake	Medical Care	Q1
Nevedal A. et al.	Rapid versus traditional qualitative analysis using the Consolidated Framework for Implementation Research (CFIR)	Implementation Science	Q1
Vicsek L. et al.	A Scheme for analyzing the results of Focus Groups	International Journal of Qualitative Methods	Q2
Vindrola-Padros C. et al.	Rapid Techniques in Qualitative Research: a critical review of the literature	Qualitative Health Research	Q1
Gale R. et al.	Comparison of rapid vs in-depth qualitative analytic methods from a process evaluation of academic detailing	Implementation Science	Q1
Miles S. et al.	Learning from difference: Sharing international experiences of developments in inclusive education	The SAGE Handbook of Special Education	Q3
Waldring I.E.	The fine art of boundary sensitivity: Second-generation professionals engaging with social boundaries in the workplace	-	-
May C.R. et al.	Development of a theory of implementation and integration:	Implementation Science	Q1

Author	Title of the Article	Journal	Journal Ranking
	normalization process theory		
O'Reilly-de Brun M. et al.	Using Participatory Learning & Action research to access and engage with 'hard to reach' migrants in primary healthcare research	BMC Health Services Research	Q2
Weis L. et al.	Working Method: Research and Social Justice	-	-
Kolluru S. et al.	Review of Best practices for Diversity, Equity, and inclusion committees within Colleges of Pharmacy	American Journal of Pharmaceutical Education	Q2
Miguel A. et al.	What's Next? From Analysis to Action	Conecd	Q3
Carminati L. et al.	Generalizability in qualitative research: a tale of two traditions	Qualitative Health Research	Q1
Shenton A. et al.	Strategies for ensuring trustworthiness in qualitative Research projects	Educational Information	Q2
Maxwell J. et al.	Why qualitative methods are necessary for generalization	Qualitative Psychology	Q2
Polit D. et al.	Generalization in quantitative and qualitative research: myths and strategies	International Journal of Nursing Studies	Q1
Brown J. et al.	Becoming a new doctor: a learning or survival exercise?	Medical Education	Q1

To conduct a bibliometric analysis in the field of student dropout using the SCOPUS database, the first step is to define the objective (identifying trends, evaluating the impact of publications, and examining collaboration patterns). Data is then collected from SCOPUS using keywords and filters for articles published between 2014 and March 2024. Metadata is exported, duplicates are removed, and the most relevant articles are selected. The VOSviewer tool is used to analyze co-citations, co-authorships, and keywords, creating network maps to visualize relationships and trends.

The results are then presented, highlighting publication trends, citation impact, and collaboration patterns, as shown in Figure 2.

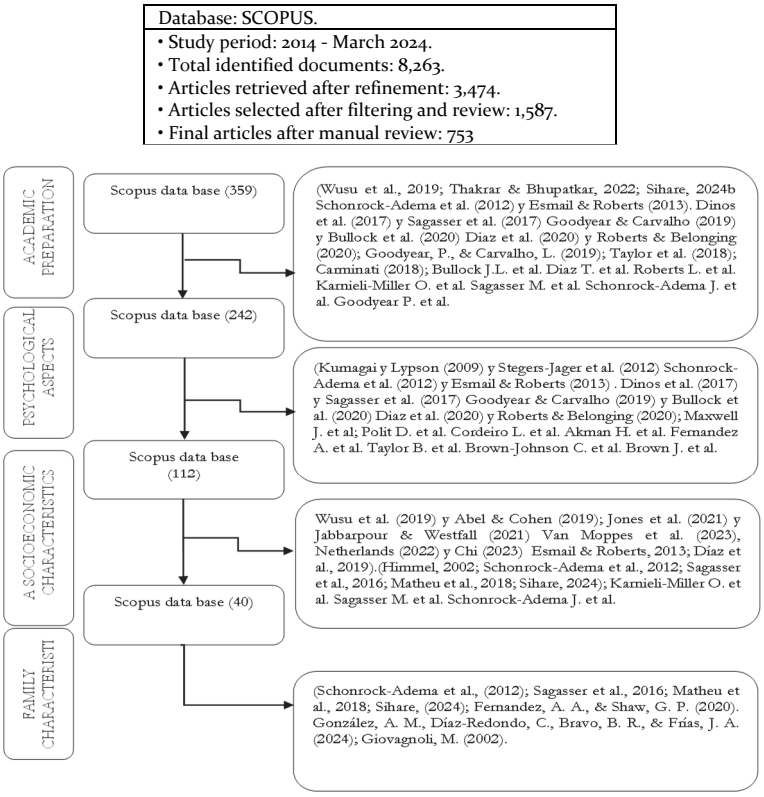


Figure 2. Flowchart of the Bibliometric Selection

4. Results and Discussion

Publication Trends

A total of 8,263 documents were identified. The search was refined to include articles published from 2014 to March 2024, resulting in the retrieval of 3,474 articles, of which 1,587 were selected after a rigorous filtering and review process. After manual review, 753 articles were retained, as illustrated in Table 3.

Table 3. Preliminary results vs results considering only to article, student dropouts

Phase 1		Phase 2	
Preliminary results : dropout and student	8,263	Results considering only to Article, Student Dropouts	1587
Field of Study	No.	Field of Study	No.
Social Sciences	4292	Medicine	497
Medicine	1869	Social Sciences	288
Computer Science	1803	Nursing	194
Psychology	1239	Psychology	168
Engineering	888	Multidisciplinary	28
Nursing	458	Arts and Humanities	26
Mathematics	392	Neuroscience	18
Economics, Econometrics and Finance	321	Pharmacology, Toxicology and Pharmaceutics	16
Arts and Humanities	313	Health Professions	13
Business, Management and Accounting	304	Dentistry	9
Decision Sciences	273	Business, Management and Accounting	8
Health Professions	126	Environmental Science	7
Physics and Astronomy	125	Immunology and Microbiology	7
Environmental Science	113	Biochemistry, Genetics and Molecular Biology	6
Multidisciplinary	104	Mathematics	6
Energy	96	Agricultural and Biological Sciences	5
Neuroscience	84	Computer Science	4
Materials Science	79	Economics, Econometrics and Finance	3
Biochemistry, Genetics and Molecular Biology	70	Veterinary	3
Agricultural and Biological Sciences	57	Engineering	1
Pharmacology, Toxicology and Pharmacy	56		
Chemical Engineering	50		
Dentistry	49		
Earth and Planetary Sciences	30		
Chemistry	26		
Immunology and Microbiology	19		
Undefined	11		
Veterinary Science	0		

The number of published articles provides a visual representation of trends in the development of a research topic. Figure 3 illustrates these trends in research on student dropout. Overall, the number of articles on this topic has shown accelerated growth over time. Between 2014 and 2004, the number of publications remained in single digits. However, starting in 2019, a significant increase in publications was observed, coinciding with the impact of the COVID-19 pandemic.

This global event drew significant attention to the topic, leading to a new surge in the number of articles. In the past three years, the annual growth rate has reached approximately 200 additional articles per year, reflecting a growing and sustained interest in the research.

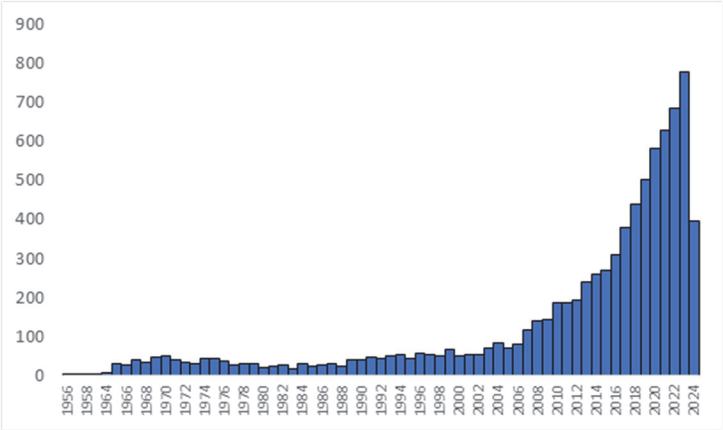


Figure 3. Number of articles in journals.

The analysis of keyword co-occurrence is essential for identifying relevant research themes and observing their temporal evolution. In this study, VOSviewer was used to construct a co-occurrence network of keywords from 753 articles. Figure 3 illustrates that the larger nodes represent more frequent terms, and the colors of the nodes distinguish different research clusters and key cited authors. The lines between nodes reflect the strength of the association, with thicker lines indicating higher frequencies of co-occurrence.

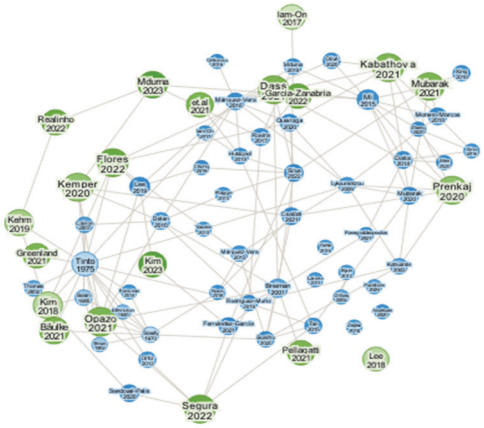


Figure 4. Mapping of co-citation of journals.

In Figure 4, the blue cluster specializes in articles with the broadest and most significant connections in the field of student dropout in higher education. This cluster groups studies that have established numerous relationships with other research, reflecting their influence and relevance within the field.

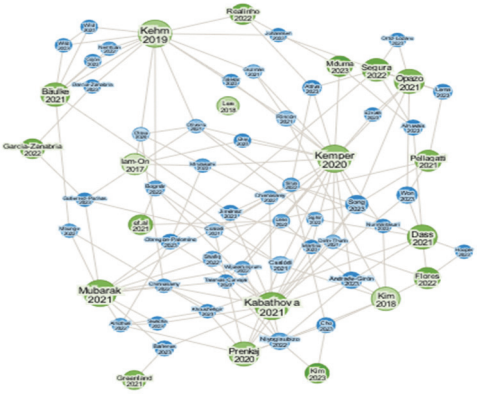


Figure 5. Mapping of co-citation of journals

In contrast, Figures 5 and 6 highlight the green cluster, which emphasizes the most cited authors related to student dropout, identifying the leading researchers whose contributions have been widely recognized and referenced in the literature. While the blue cluster provides insight into the interconnections and impact of studies, the green cluster underscores the authority and recognition of key authors, highlighting their role in advancing knowledge in this area. Together, these clusters offer a comprehensive understanding of both the most influential works and the prominent researchers in the study of student dropout in higher education.

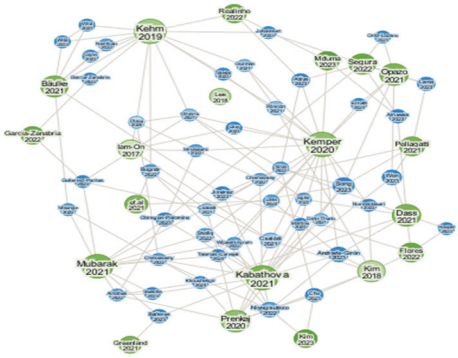
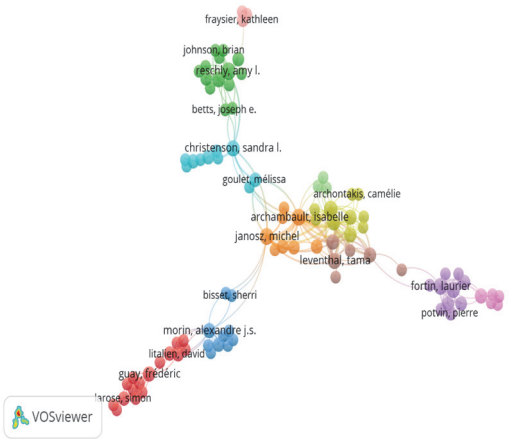


Figure 6. Mapping of co-citation of journals

In Figure 7, various clusters addressing different aspects of student dropout are visualized. The green cluster focuses on interventions aimed at mitigating dropout, investigating how individual factors, such as social support and a sense of belonging, can influence the reduction of student dropout. On the other hand, the yellow cluster explores the impact of external factors, such as academic challenges and external pressures, on dropout rates. The light purple cluster examines institutional factors, analyzing how aspects such as the quality of services and the organizational structure of institutions can contribute to increased dropout. Finally, the light red cluster highlights correlations and intervention methods related to student dropout, emphasizing the importance of socioeconomic factors and their influence on efforts to reduce dropout.



Figurre 7. Mapping of co-citation of journals

These clusters provide a comprehensive view of the multiple dimensions involved in student dropout, facilitating a deeper understanding of the factors contributing to this phenomenon and the strategies to address it. From 2014 to 2024, the literature on student dropout in universities initially showed limited coverage, focusing on topics such as the relationship between students and dropout, including aspects like depression and attitudes towards the issue. In the early years, the focus was on identifying and describing the visible symptoms and factors associated with dropout, without delving into the underlying internal mechanisms of this phenomenon. This early phase is reflected in Figure 8, which illustrates the number of publications in the initial years of the analyzed period.

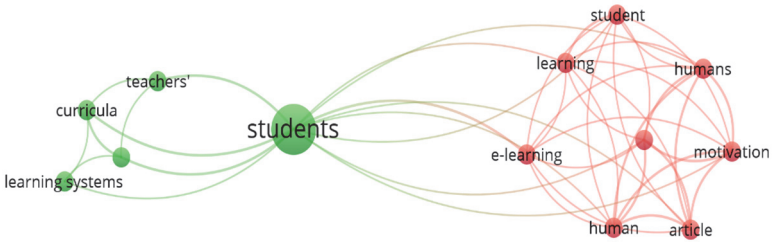


Figure 8. Mapping of co-citation of journals

Over time, research delved into a more detailed exploration of the underlying factors contributing to student dropout. As studies progressed, they began to address more complex issues related to structural, institutional, and personal causes. Figure 9 illustrates the emerging thematic clusters in the literature, showing how research has diversified to include deeper aspects of the phenomenon. The cluster highlighted in red, as shown in the figure, groups articles and authors focusing on specific and complex aspects of student dropout, reflecting the increasing sophistication in research on the topic.

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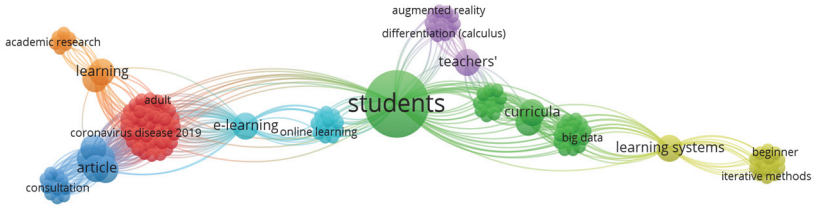

Figure 9. Mapping of co-citation of journals

Figure 10, illustrates the growth trends in the number of publications and how research focus areas have evolved, highlighting the need for deeper and more diverse research to effectively address student dropout. Since 2019, there has been a significant increase in the number of keywords related to student dropout, indicating a substantial expansion in the focus of articles on this topic. The graph presents a conglomerate of all authors and co-authors, including new terms in the development of this research area. On this timeline, most studies exhibit network conglomerates and inclusion of research into a conglomerate, where the cluster mainly focuses on the influence of specific elements such as social support.

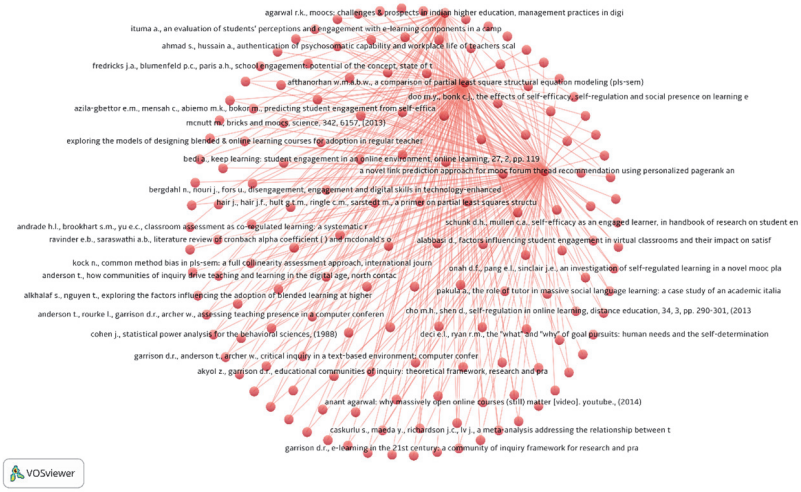

Figure 10. Mapping of co-citation of journals

5. Conclusions

Research on student dropout has experienced notable growth since 2019, largely driven by the impact of the COVID-19 pandemic. This increase has led to a significant expansion in the topics and approaches addressed in the field, reflecting a growing interest in understanding and addressing this complex phenomenon.

Cluster and evolutionary analyses have identified key areas and emerging trends in research on university student dropout. Stable research themes, such as student behavior and specific influencing factors, have been established through co-occurrence and clustering analysis. However, changes in social contexts have led to a proliferation of new topics and approaches. Citation analysis of highly cited literature provides insights into changing trends and key research points in this field.

Bibliometric analysis highlights a broad range of topics, from individual factors to socioeconomic and cultural influences. Although there has been an increase in the number of publications and keywords related to student dropout, many areas still require deeper exploration. Co-occurrence analysis of keywords shows an evolution in research areas, with an increasing emphasis on topics such as social support. These co-occurrence networks underscore the need to integrate new terms and approaches into research to address student dropout more comprehensively. Finally, broadening the thematic scope, considering socioeconomic and cultural influences, and improving support systems for students are essential for reducing dropout rates and enhancing retention in educational institutions.

References

Abdellah, F., & Gooneratne, N. (2021). Participatory action research: Contributions to the development of practitioner inquiry in education. *Educational Action Research, 17*(1), 79-93.

Abel, G. J., & Cohen, J. E. (2019). Bilateral international migration flow estimates for 200 countries. Scientific Data, 6(1). https://doi.org/10.1038/s41597-019-0156-5

Alabbasi, D. (2022). Factors influencing student engagement in virtual classrooms and their impact on satisfaction. In *Society for Information Technology & Teacher Education International Conference* (pp. 142-151).

Andrade, H. L., Brookhart, S. M., & Yu, E. C. (2021). Classroom assessment as co-regulated learning: A systematic review. *Frontiers in Education, 6*. https://doi.org/10.3389/feduc.2021.751168

Angelaina, S., & Jimoyiannis, A. (2012). Analysing students' engagement and learning presence in an educational blog community. *Educational Media International, 49*(3), 183-200. https://doi.org/10.1080/09523987.2012.738012

Blanco-Varela, B., Amoedo, J. M., & Sánchez-Carreira, M. C. (2024). Analysing ability grouping in secondary school: A way to improve academic performance and mitigate educational inequalities in Spain? International Journal Of Educational Development, 107, 103028. https://doi.org/10.1016/j.ijedudev.2024.103028

Brydon-Miller, M., & Maguire, P. (2009). Participatory action research: contributions to the development of practitioner inquiry in education. *Educational Action Research*, *17*(1), 79-93. https://doi.org/10.1080/09650790802667469

Bullock, J. L., Lockspeiser, T., Del Pino-Jones, A., Richards, R., Teherani, A., & Hauer, K. E. (2020). They don't see a lot of people my color: A mixed methods study of racial/ethnic stereotype threat among medical students on core clerkships. Academic Medicine, 95, S58-S66. https://doi.org/10.1097/ACM.0000000000003091

Bound, J., & Turner, S. E. (Eds.). (2011). Handbook of the economics of education. Elsevier.

Bedi, A. (2023). Keep Learning: Student Engagement in an Online Environment. *Online Learning*, *27*(2). https://doi.org/10.24059/olj.v27i2.3287

Bergdahl, N., Nouri, J., & Fors, U. (2020). Disengagement, engagement, and digital skills in technology-enhanced learning. *Education and Information Technologies, 25*, 957-983.

Bozalek, V., & Biersteker, L. (2010). Exploring power and privilege using participatory learning and action techniques. *Social Work Education, 29*(5), 551-572.

Bruff, D. O., Fisher, D. H., McEwen, K. E., & Smith, B. E. (2013). Wrapping a MOOC: Student perceptions of an experiment in blended learning. *Journal of Online Learning and Teaching, 9*(2), 187-199.

Brydon-Miller, M., & Maguire, P. (2009). Participatory action research: Contributions to the development of practitioner inquiry in education. *Educational Action Research, 17*(1), 79-93.

Caskurlu, S., Maeda, Y., Richardson, J. C., & Lv, J. (2020). A meta-analysis addressing the relationship between teaching presence and students' satisfaction and learning. *Computers & Education, 157*.

Carter, P., & Darling-Hammond, L. (2016). Teaching diverse learners. In *Handbook of research on teaching* (pp. 593-638).

Carminati, L. (2018). Generalizability in Qualitative Research: A Tale of Two Traditions. *Qualitative Health Research*, *28*(13), 2094-2101. https://doi.org/10.1177/1049732318788379

Chevalier, J. M., & Buckles, D. J. (2019). Participatory Action Research. En *Routledge eBooks*. https://doi.org/10.4324/9781351033268

Chi, X. (2023). The influence of presence types on learning engagement in a MOOC: The role of autonomous motivation and grit. Psychology Research and Behavior Management, 16, 5169-5181. https://doi.org/10.2147/prbm.s442794

Cordeiro, L., Rittenmeyer, L., & Soares, C. B. (2015). Action research methodology in the health care field: A scoping review protocol. *JBI Database of Systematic Reviews and Implementation Reports, 13*(8), 70-78.

Craven, R. G., Marsh, H. W., Yeung, A. S., Vasconcellos, D., Dillon, A., Ryan, R. M., Mooney, J., Franklin, A., Barclay, L., & Van Westenbrugge, A. (2024). The multidimensional student well-being (MSW) instrument: Conceptualisation, measurement, and differences between Indigenous and non-Indigenous primary and secondary students. Contemporary Educational Psychology, 77, 102274. https://doi.org/10.1016/j.cedpsych.2024.102274

Diaz, T., Navarro, J. R., & Chen, E. H. (2019). An Institutional Approach to Fostering Inclusion and Addressing Racial Bias: Implications for Diversity in Academic Medicine. *Teaching And Learning In Medicine*, *32*(1), 110-116. https://doi.org/10.1080/10401334.2019.1670665

Ding, X., & Yang, Z. (2020). Knowledge mapping of platform research: a visual analysis using VOSviewer and CiteSpace. *Electronic Commerce Research*, *22*(3), 787-809. https://doi.org/10.1007/s10660-020-09410-7

Dinos, S., Ascoli, M., Owiti, J. A., & Bhui, K. (2017). Assessing explanatory models and health beliefs: An essential but overlooked competency for clinicians. *BJPsych Advances*, *23*(2), 106-114. https://doi.org/10.1192/apt.bp.114.013680

Edumadze, J. K. E., & Govender, D. W. (2024). The community of inquiry as a tool for measuring student engagement in blended massive open online courses (MOOCs): A case study of university students in a developing country. Smart Learning Environments, 11(1). https://doi.org/10.1186/s40561-024-00306-9

Esmail, A., & Roberts, C. (2013). Academic performance of ethnic minority candidates and discrimination in the MRCGP examinations between 2010 and 2012: Analysis of data. BMJ (Clinical Research ed.), 347. https://doi.org/10.1136/bmj.f5662

Farrell, O., & Brunton, J. (2020). A balancing act: A window into online student engagement experiences. International Journal of Educational Technology in Higher Education, 17(1). https://doi.org/10.1186/s41239-020-00199-x

Fernandez, A. A., & Shaw, G. P. (2020). Academic Leadership in a Time of Crisis: The Coronavirus and COVID-19. *Journal Of Leadership Studies*, *14*(1), 39-45. https://doi.org/10.1002/jls.21684

González, A. M., Díaz-Redondo, C., Bravo, B. R., & Frías, J. A. (2024). Análisis de la producción científica de la Universidad de Salamanca indexada en SCOPUS (2010-2015). *InformaciÓN, Cultura y Sociedad/Información, Cultura y Sociedad*, *50*, 49-67. https://doi.org/10.34096/ics.i50.13697

Giovagnoli, M. (2002). Educational paths: A comparison of early career outcomes of male and female college graduates. American Sociological Review, 67(6), 826-849.

Goodyear, P., & Carvalho, L. (2019). The analysis of complex learning environments. In The Analysis of Complex Learning Environments (pp. 49-65). https://doi.org/10.4324/9781351252805-4

Holzer, J., Grützmacher, L., Lüftenegger, M., Prenzel, M., & Schober, B. (2024). Shedding light on relations between teacher emotions, instructional behavior, and student school well-being – Evidence from disadvantaged schools. Learning And Instruction, 92, 101926. https://doi.org/10.1016/j.learninstruc.2024.101926

Hauer, K. E., Giang, D., Kapp, M. E., & Sterling, R. (2020b). Standardization in the MSPE: Key Tensions for Learners, Schools, and Residency Programs. *Academic Medicine*, *96*(1), 44-49. https://doi.org/10.1097/acm.0000000000003290

Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D., & Besuch, G. (2003). Dropout from universities. Final report to the German Research Foundation (DFG), Heidelberg University.

Heublein, U., Spangenberg, H., & Sommer, D. (2010). Institutions and institutional change in European higher education: The theoretical framework of a comparative study. Higher Education, 60(5), 563-579.

Jabbarpour, Y., & Westfall, J. (2021). Diversity in the family medicine workforce. Family Medicine, 53(7), 640-643. https://doi.org/10.22454/FamMed.2021.971329

Karnieli-Miller, O., Vu, T. R., Holtman, M. C., Clyman, S. G., & Inui, T. S. (2010). Medical students' professionalism narratives: A window on the informal and hidden curriculum. Academic Medicine, 85(1), 124-133. https://doi.org/10.1097/ACM.0b013e3181c43e5d

Kroupova, K., Havranek, T., & Irsova, Z. (2024). Student Employment and Education: A Meta-Analysis. Economics Of Education Review, 100, 102539. https://doi.org/10.1016/j.econedurev.2024.102539

Larsen, M. (2000). Factors influencing student retention: A multivariate analysis of student dropouts. Journal of College Student Retention: Research, Theory & Practice, 2(1), 55-68.

Litalien, D., Tóth-Király, I., Guay, F., & Morin, A. J. (2024). PhD students' motivation profiles: A self-determination theory perspective. Contemporary Educational Psychology, 77, 102279. https://doi.org/10.1016/j.cedpsych.2024.102279

Liu, W. C., Wang, C. K. J., Kee, Y. H., Koh, C., Lim, B. S. C., & Chua, L. (2013). College students' motivation and learning strategies profiles and academic achievement: a self-determination theory approach. *Educational Psychology*, *34*(3), 338-353. https://doi.org/10.1080/01443410.2013.785067

Mays, N. (2000). Qualitative research in health care: Assessing quality in qualitative research. *BMJ. British Medical Journal*, *320*(7226), 50-52. https://doi.org/10.1136/bmj.320.7226.50

Mortier, P., Demyttenaere, K., Auerbach, R. P., Green, J. G., Kessler, R. C., Kiekens, G., Nock, M. K., & Bruffaerts, R. (2015). The impact of lifetime suicidality on academic performance in college freshmen. Journal of Affective Disorders, 186, 254-260. https://doi.org/10.1016/j.jad.2015.07.030

OECD. (2020). Education at a glance 2020: OECD indicators. OECD Publishing.

Sagasser, M. H., Kramer, A. W. M., Fluit, C. R. M. G., Van Weel, C., & Van Der Vleuten, C. P. M. (2016). Self-entrustment: how trainees' self-regulated learning supports participation in the workplace. *Advances In Health Sciences Education*, *22*(4), 931-949. https://doi.org/10.1007/s10459-016-9723-4

Schonrock-Adema, J., Bouwkamp-Timmer, T., Hell, E., & Cohen-Schotanus, J. (2012). Key elements in assessing the educational environment: Where is the theory? *Advances in Health Sciences Education: Theory and Practice, 17*. https://doi.org/10.1007/s10459-012-9352-y

Sihare, S. R. (2024b). Student Dropout Analysis in Higher Education and Retention by Artificial Intelligence and Machine Learning. *SN Computer Science/SN Computer Science*, *5*(2). https://doi.org/10.1007/s42979-023-02458-w

Spady, W. G. (1970). Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange, 1(1), 64-85.

Thakrar, N. T., & Bhupatkar, S. H. (2022). «MOOCs - The Learning Driver for the Students of Higher Education: Awareness among the students regarding MOOCs.» *SKIPS ANVESHAN*, *3*(1), 73-86. https://doi.org/10.53031/skips.3.1.2022.06

Taylor, B., Henshall, C., Kenyon, S., Litchfield, I., & Greenfield, S. (2018). Can rapid approaches to qualitative analysis deliver timely, valid findings to clinical leaders? A mixed methods study comparing rapid and thematic analysis. *BMJ Open*, *8*(10), e019993. https://doi.org/10.1136/bmjopen-2017-019993

Tinto, V. (2006a). Research and practice of student retention: What next? Journal of College Student Retention, 8*(1), 1-19. https://doi.org/10.2190/4ynu-4tmb-22dj-an4w