

College Students' Learning Burnout: Current Research Status, Hot Spots, and Trends - A CiteSpace Bibliometric Analysis

Tian Hao^{1,2}, Vincent Wee Eng Kim¹

¹Universiti Tun Abdul Razak (UNIRAZAK), Malaysia

²Weinan Normal University, Shaanxi, China

Abstract

By bibliometric analysis of 1,233 literatures on College Students' Learning Burnout in CNKI database between 2004 and 2024, it reveals the research trends, hotspots and problems in this field. It was found that the research on Learning Burnout among college students began in 2004, and experienced four stages: preliminary exploration, rapid growth outbreak, steady development, and slow development with reduced heat, especially after the new crown epidemic, the research heat decreased significantly. Although core journals in the fields of psychology, medicine, and education have paid attention to Learning Burnout, the output of high-quality research papers still needs to be improved. There is a loose cooperative network of research institutions, a low density of cooperative networks of authors, and a limited number of high-yield authors. There are a wide range of research hotspots, including influencing factors, countermeasures, current situation, professional commitment, psychological capital, etc., but some of the studies lack depth and fail to form a systematic theoretical framework. Future research should strengthen interdisciplinary cooperation and integration, promote the output of high-quality research papers, build a close cooperative network of research institutions, promote cooperation and communication among authors, and address the challenges brought by the post epidemic era to promote the translation and application of research results.

Keywords: college students, Learning Burnout, CiteSpace, bibliometric analysis

1 Introduction

Learning Burnout is a growing problem among college students and has become more prevalent in recent years (Chiedu Eseadi, 2022). Irene Messina et al (2024) stated that Learning Burnout is a condition characterized by exhaustion, cynicism, detached attitudes towards learning, and reduced self-efficacy in academic activities.

Martina Morando et al (2023) argued that Learning Burnout is a health problem of global concern that afflicts students at all academic levels. This is corroborated by researchers in many other countries. D. Andrade et al. (2023) studied 519 graduate students in universities in Hungary and other European countries and found that Learning Burnout, along with the Covid-19 pandemic, greatly affected the academic life and psychological well-being of graduate students. Agus Supriyanto et al. (2024) pointed out that online learning has led to a decrease in

self-efficacy in Indonesia and that online learning has led to a decrease in self-efficacy in Indonesia.), on the other hand, pointed out that online learning has caused severe Learning Burnout among Indonesian students, affecting their self-confidence, motivation, academic performance, self-control, and even leading to depression. G. Draghici et al (2022), through a study of 151 working students from different Romanian universities, found that stress and burnout exist in all aspects of personal life, and that an increasing number of working students had some concerns about their involvement in academic tasks and completion of their studies, and that academic burnout was higher than job burnout.

Jiao Yingzhen (2021) found that Learning Burnout was prevalent among college students in 18 universities in six regions of China. Lu (2024) reaffirmed the view that Learning Burnout is common among college students in China, and suggested that even though the effective recovery rate of Learning Burnout was as high as 86% after psychological interventions for college students, it still seriously affects college students' academic performance and hampers their physical and mental healthy development.

Many scholars agree that Learning Burnout has many negative effects and serious consequences for students. Salvador Reyes-de-Cózar et al (2023) stated that burnout, if prolonged, combined with stress and high workloads, can motivate students to drop out of school, which negatively affects individuals and groups. Learning Burnout can lead to a decline in students' academic performance in schools, colleges and universities (Madigan et al., 2020).

Hou Yongmei (2021) pointed out that Learning Burnout is a common psychological problem among college students, and Learning Burnout among college students seriously affects academic performance and physical and mental health, wastes educational resources, and poses a potential threat by bringing all kinds of hidden dangers to the growth of talents and social development.

It can be seen that Learning Burnout is one of the main problems in higher education at present, and the problems it brings to students cannot be ignored and deserve attention. The first research on Learning Burnout in China was conducted by Lu Zhengzheng and Wan Xiumei in 1994. However, it was not until 2004-2005 that a more systematic study was conducted by scholars such as Yang Lixian and Lian Rong, which focused on the definition, measurement and correlation of Learning Burnout. In recent years, research on Learning Burnout has continued to grow.

Onur Bali et al (2024) pointed out that although Learning Burnout has become more prominent in recent discussions, there is still a lack of a systematic review to summarize the large amount of literature on academic burnout, so he searched for articles from the WoS database and analyzed them, and found that there has been a significant increase in the number of articles on Learning Burnout in recent years, and the countries with the largest number of publications include China, the United States, and Finland. A few scholars in China have also conducted bibliometric analysis studies from the direction of learning burnout (Ma Li et al. 2023; Wang Chengqing & Cui Lizhong, 2017; Li Bingzhong et al. 2016; Li Qihui & Xu Dazhen, 2013), English

learning burnout (He Jie et al. 2022), and higher vocational students' learning burnout (Yuan Qinqin, 2017), respectively. However, no scholars have yet to grasp the overall research on Learning Burnout in the college student population from the perspective of bibliometric analysis.

Based on this, this study used CiteSpace 6.4.R1 software to conduct a bibliometric analysis of the current status of research on Learning Burnout among college students, research hotspots, and research trends in domestic China, to understand the overall dynamics of research in this field, and then provide research directions for more scholars in the study of Learning Burnout among college students.

2 Research Design

2.1 Data Source

On December 15, 2024, this study took CNKI database as the data source of literature search, and used advanced search to manually search the literature related to “Learning Burnout of College Students”. In order to avoid that some of the retrieved articles only included “Learning Burnout” as a related factor in the study of other key issues, but did not take “Learning Burnout” as the main body of the study, therefore, “Title of Article (TI)” was used as the first level of search field in the search. Inputting “Learning Burnout” or “Academic Burnout” into “Title (TI)”, we searched and found 2948 academic journals, master's and doctoral theses, conference papers and other documents.

The “subject” field search in CNKI combines “title”, “keywords”, “abstract” and other search items, and has the advantages of wide search scope, strong professionalism, advanced algorithm and strong adaptability, which can more comprehensively reflect the subject content of the literature and improve the accuracy and comprehensiveness of the search.

Therefore, in order to avoid some scholars do not directly use “college students” in the “title” of the published papers, but may be “undergraduates”, “graduate students”, “medical students”, “students of a certain specialty” and other terms. On the basis of the first search just now, we searched for “college students” with “subject (SU)” as the search field, and conducted a second search, which retrieved 1244 academic journals, master's and doctoral theses, conference papers and other documents. Then, on the basis of manual review, excluding the results of the introduction, newspapers and other non-academic literature, the data were screened and de-weighted, and finally a total of 1,233 pieces of valid literature remained, with the collection deadline of December 15, 2024, and all the searched literature spanning the years from 2004-2024 (December), which were included in the current bibliometric analysis.

2.2 Research tools

The CiteSpace bibliometric analysis software used in this study is a multifaceted and dynamic visualization and analysis software developed by Dr. Chaomei Chen of Drexel University based

on JAVA language. It is considered to be one of the most recognized techniques in the international knowledge metrology community (Zhu Leiye et al., 2019).

By quickly conducting scientific econometric analysis of a large number of research literature on a certain discipline or topic and visualizing key issues such as hot areas, frontiers, and future research trends of research on a certain discipline or topic, it is at the international leading level in scientometrics software (Chen Yue et al., 2015).

Wang Yinmei et al. (2021) pointed out that the software uses network algorithms to transform literature data into intuitive knowledge graphs, which facilitates in-depth mining and correlation cascading of the intrinsic information of the literature, and realizes the detection of the evolutionary mechanism and the developmental frontiers of the research field from the dynamic and time-sharing perspectives.

2.3 Research Methods

In this study, since the data information exported from the CNKI database does not provide citation information, we mainly use two functional methods, cooperative network node analysis and keyword co-occurrence network node analysis, in order to explore the research hotspots, development trends and cutting-edge dynamics in the field of College Students' Learning Burnout.

First of all, we processed the data and used the format converter of CiteSpace software to convert CNKI documents into recognizable data formats.

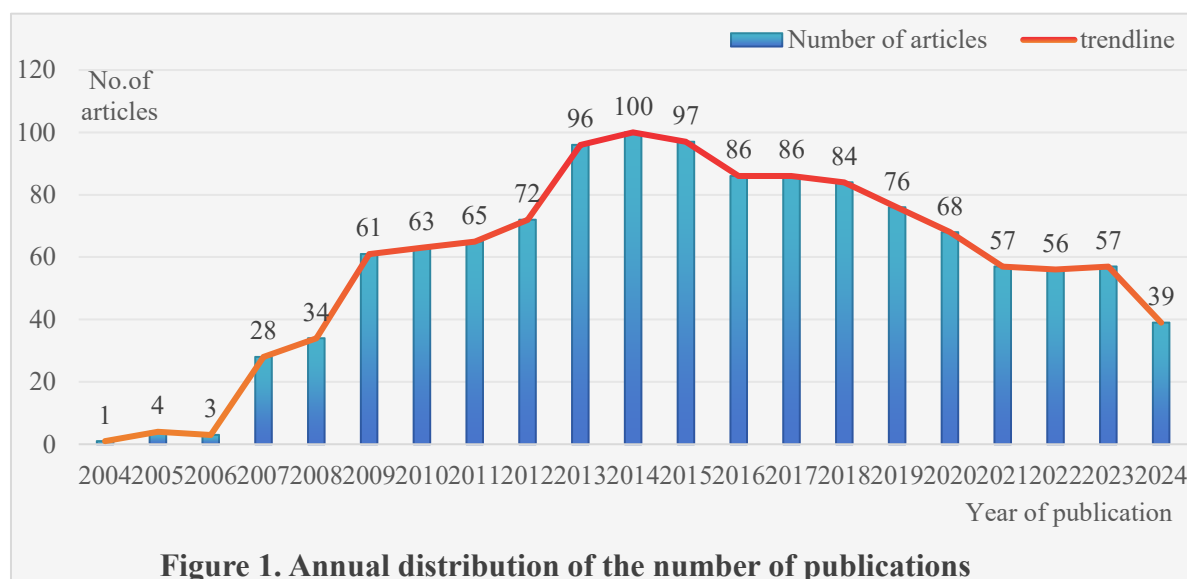
Subsequently, the cooperative network node analysis of "author" and "organization" was carried out first, and the size of the node represents the frequency of the information, and through the node frequency analysis, high-yield authors, important organizations and research hotspots can be identified. Statistics and mapping of the time of publication, research institutions, authors, and co-occurrence mapping are performed to reveal the evolution of the research field.

Then keyword co-occurrence analysis is performed to generate keyword co-occurrence mapping. Through the size of the nodes in the map and the degree of network connection, the strength of the association between keywords is analyzed, which in turn reflects the research hotspots and thematic structure of the field. At the same time, the keywords are analyzed by clustering to generate a keyword clustering map, which summarizes the same or similar keywords to form different research themes or fields.

Finally, the keywords are analyzed by time zone map and burst map. The time zone map can clearly show the high-frequency keywords appearing in each year, while the burst map is to use the burst word algorithm to analyze the words with high frequency appearing in a specific time, and then to determine the research frontier of a certain field. Combined with the combination of the map and the content of related literature, the research hotspots, frontier dynamics and future trends in the field of College Students' Learning Burnout are analyzed in depth.

3 Results and Analysis

3.1 Analysis of the annual number of articles issued



Analyzing Figure 1, it can be seen that the study of Learning Burnout among college students in China began in 2004, and the number of papers published on the study of Learning Burnout among college students during the 21 years from 2004 to 2024 has shown a trend of increasing first and decreasing later, and can be roughly divided into the following four stages.

The first stage is from 2004 to 2006, which is in the preliminary exploration stage, and a total of 8 papers were published in 3 years, with an annual average of only 2.66 papers, reflecting that the progress of carrying out the research on Learning Burnout of college students is extremely slow, and only a very few scholars try to carry out research in this field.

The second stage is from 2007 to 2014, which belongs to the period of rapid growth and explosion, in which the relevant research papers reached 28 in 2007, and thus began to grow for seven consecutive years, reaching a peak of 100 in 2014, with an annual average of 64.88 research documents, reflecting that the academic heat of college students' Learning Burnout has been emphasized by scholars since 2007.

The third stage is from 2015 to 2019, which belongs to the period of steady development. Although the number of articles published each year is not as high as the peak, the average number of research papers reached 85.8 in five years, reflecting that the research on Learning Burnout among college students has always maintained a high degree of enthusiasm.

The fourth phase, from 2020 to 2024, belongs to the period of slow development with reduced heat, during which the annual average number of research documents is only 55.4, which is significantly lower than that of the second and third phases, reflecting that the heat of research on Learning Burnout among college students has begun to decline. The reason for this may have

been affected by the COVID-19 epidemic. Massimo Volpe et al (2024) stated that the most critical issues faced by academic researchers during the COVID-19 epidemic were access to libraries, laboratories, research venues, limitations on stays abroad, and the progress of their experimental work. Emmanuel O. Ojo et al (2023) argued that during the COVID-19 epidemic, two-thirds of the academics experienced a decline in research output or even no research output at all. As at December 15, 2024, the cut-off date for data counting in this study, there were only 39 relevant literatures for the year 2024, a number that is only higher than the first five years of the study's earliest beginnings, so it can be said that the study of Learning Burnout among university students has stepped into a period of slow development with reduced enthusiasm, and even the possibility of a complete decline in research enthusiasm.

3.2 Analysis of high-frequency journal publications

Excluding 211 master's and doctoral dissertations, 1022 journal articles were analyzed for the frequency of journal issuance, as shown in Table 1. Among them, Chinese Journal of Health Psychology (52 articles), Chinese Journal of Clinical Psychology (16 articles), and Chinese Journal of School Health (14 articles), all of which are core level journals in psychology and medicine. Most of the other journals that ranked in the top 10, such as Journal of Campus Life & Mental Health (18 articles), Psychology Monthly (17 articles), Health Vocational Education (16 articles), Journal of Higher Education (10 articles), and China Higher Medical Education (10 articles), were also mainly journals specializing in psychology and education. It shows that Learning Burnout is highly valued by psychology, medicine and education, and the quality of the papers is relatively high. However, taking 1022 articles as a base, the overall output of high-quality research papers needs to be improved.

Table 1 Top 10 journals in terms of research publication volume

Name of Publication	No.of articles	Name of Publication	No.of articles
China Journal of Health Psychology	52	Occupation and Health	15
Journal of Campus Life & Mental Health	18	Chinese Journal of School Health	14
Psychology Monthly	17	Cultural and educational literature	12
Health Vocational Education	16	Journal of Higher Education	10
Chinese Journal of Clinical Psychology	16	China Higher Medical Education	10

3.3 Collaborative network analysis of research institutions

In order to ensure the accuracy of data measurement of research institutions, manual data integration was performed for different departments under the same institution. After that, the visual mapping analysis was carried out on the institutions of college students' Learning Burnout research, selecting Node Types as "Institution" to run, and selecting "Show the largest 10 sub-networks" in the filtering options. As shown in Figure 2, a total of 343 nodes and 89 lines have been generated, with a density of 0.0015, indicating that there are 343 institutions or agencies studying Learning Burnout among college students, of which higher education institutions are the main force of the study, and all the institutions or agencies have formed 89 cooperative relationships, which indicates that Learning Burnout among college students has

formed a cooperative network of institutions, but the degree of cooperation is very weak, and the cooperative relationship is relatively decentralized.

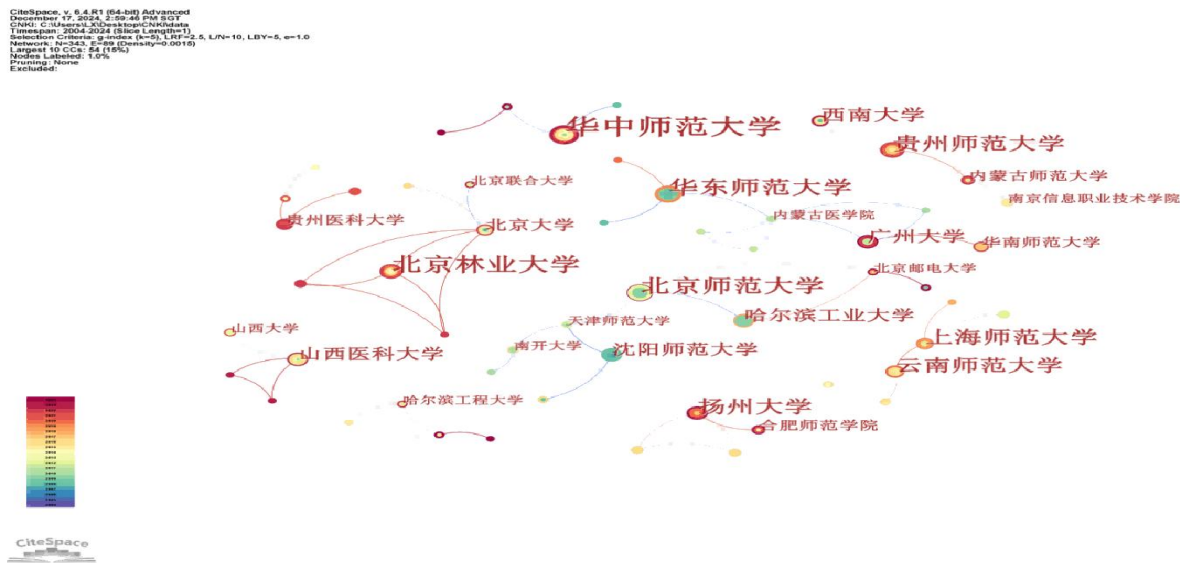


Figure 2 Co-occurrence mapping of the distribution of research institutions(showing the 10 largest sub-networks)

A research community with strong influence and relatively large number of clusters has been formed with Beijing Forestry University, Beijing Normal University, East China Normal University, Shanghai Normal University and Yunnan Normal University as the core. However, in terms of the centrality value, the

Research institutions on College Students' Learning Burnout have not formed a core research institution for the time being (the centrality value of all institutions is 0), and the top 10 institutions in terms of the number of publications, the number of publications and the year of the first publication of the literature are shown in Table 2.

Table 2 Top 10 institutions in terms of research publication volume

Institution	Count	Year	Institution	Count	Year
Central China Normal University	17	2007	Henan University	11	2007
Fujian Normal University	16	2004	Shandong Normal University	10	2006
Beijing Forestry University	12	2012	Shanghai Normal University	9	2007
Beijing Normal University	11	2007	Guizhou Normal University	9	2007
East China Normal University	11	2006	Yangzhou University	9	2016

The comprehensive chart shows that although Fujian Normal University, Henan University, and Shandong Normal University have 16, 11, and 10 articles in their publication volume respectively, they hardly conduct collaborative research, and thus are not visible in the collaborative network mapping.

3.4 Analysis of author cooperation network and high-yield authors

Select Node Types as “author” to run, visualize and analyze the authors of Learning Burnout among college students, and filter out the nodes with a small amount of publications and no network formation, the results are shown in Figure 3, with a total of 507 nodes, 211 lines, and a density of 0.0016, indicating that 507 authors have done related research. 507 authors have done related research, which shows that the author group in the field of Learning Burnout among college students is quite large, but the density of author cooperation network is low. From the cooperation map, it can be seen that a certain author cooperation network is formed, and there are some cooperative co-occurrence relationships, but the distribution of authors is relatively dispersed and there are still most of the isolated nodes are not connected, and the cooperation network is relatively loose.

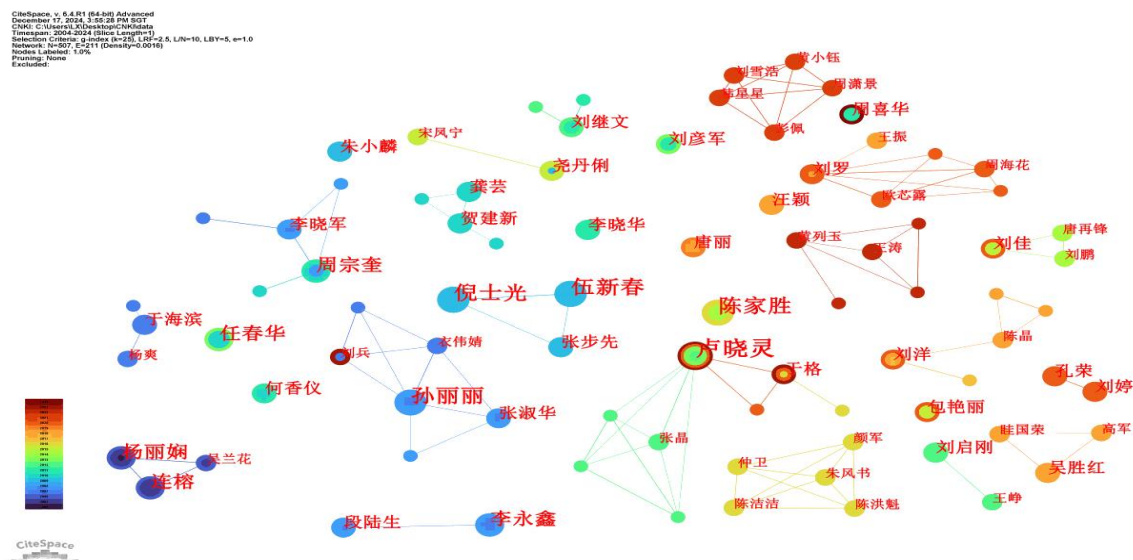


Figure 3 Co-occurrence mapping of author distribution

The top 10 authors in terms of the number of publications, the number of publications, and the year of first publication are shown in Table 3. The author with the largest number of publications is Lu Xiaoling, with a total of 6. Since 2012, she has been cooperating with Zhang Jing, Yu Ge, and others, and has been conducting long-term research on college students' Learning Burnout, with the main direction of the research on the causes of Learning Burnout, and the relationship between Learning Burnout, self-esteem, and social support, with the largest time span of her research. The time span of their research is the largest. Secondly, Ni Shiguang cooperated with Wu Xinchun for many times to carry out an in-depth study on Learning Burnout among college students in 2009, and all five articles were published in that year, mainly analyzing the characteristics of Learning Burnout among college students and intervention prevention. Scholars such as Sun Lili, Zhou Zongkui, and Li Yongxin were also heavily engaged in related research during the rapid growth outbreak period and formed a certain cooperative network with other authors, in which Sun Lili mainly studied the relationship between Learning Burnout of college students and self-esteem, life satisfaction, and subjective well-being. Zhou Zongkui mainly studied the Learning Burnout coping styles of teacher training college students, while two scholars, Chen Jiasheng and Ren Chunhua, conducted a large number of independent studies without collaborating with other scholars, and their research directions were much

broader, involving measurements, surveys, and correlation studies of Learning Burnout. The studies of these scholars have all made important contributions to the development of the field.

Table 3 Top 10 authors in terms of research publications

Author	Count	Centrality	Year	Author	Count	Centrality	Year
Lu Xiaoling	6	0	2012	Ren Chunhua	4	0	2010
Wu Xinchun	5	0	2009	Zhou Zongkui	4	0	2008
Ni Shiguang	5	0	2009	Li Yongxin	4	0	2007
Sun Lili	5	0	2007	Yang Lixian	4	0	2004
Chen Jiasheng	5	0	2014	Lian Rong	4	0	2005

However, integrating the charts shows that the connectivity of individual authors is loose and the centrality value of all authors is 0, which indicates that authors' cooperation with each other is lacking. It can be seen that collaborative communication in studying Learning Burnout among college students still needs to be strengthened.

3.5 Analysis of research hotspots based on keywords

3.5.1 Keyword co-occurrence analysis

Select Node Types as “keyword”, due to the large amount of data, in order to filter out some unimportant nodes in the research network, so choose the “Minimum Spanning Tree” pruning algorithm, and “Pruning Sliced Networks” streamlining strategy, to run. The college students Learning Burnout keywords co-occurrence analysis, the results are shown in Figure 4. A total of 519 nodes and 998 links were generated with a density of 0.0074, which means that 519 keywords were formed in 1233 articles.

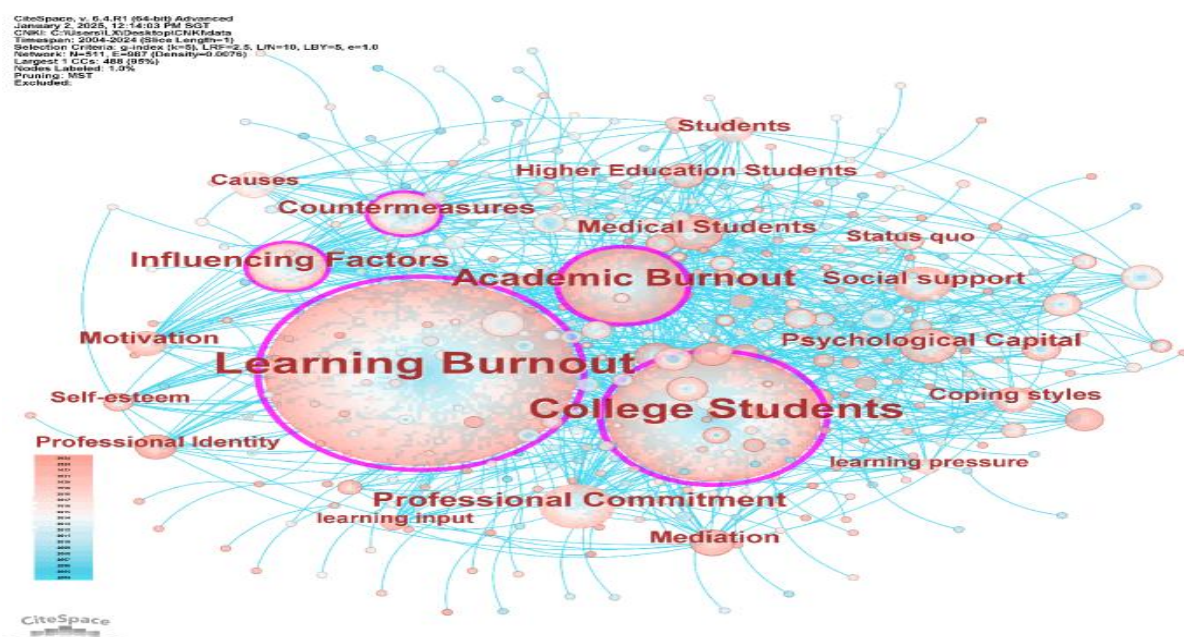


Figure 4 Keyword co-occurrence mapping

In Figure 4, the size of the keyword font and the size of the circle are positively correlated with the frequency of the keywords, the larger the font and the larger the circle, indicating that the relevant content topic is a research hotspot, and the connecting line between the nodes represents its co-occurrence relationship. The keywords with a frequency of 20 times or more are shown in the figure, and they are ranked according to the frequency of keywords from high to low, as shown in Table 4.

Table 4 Keywords with a frequency of 20 or more times

Keywords	Count	Centrality	Year	Keywords	Count	Centrality	Year
Learning Burnout	945	0.87	2004	Mediation	37	0.02	2012
College Students	504	0.64	2004	Coping styles	32	0.05	2007
Academic Burnout	176	0.26	2005	Higher Education Students	28	0.04	2007
Influencing Factors	96	0.17	2005	Professional Identity	27	0.04	2013
Professional Commitment	89	0.09	2004	Causes	27	0.03	2009
Countermeasures	56	0.11	2005	Students	23	0.02	2009
Psychological Capital	49	0.06	2012	Status quo	23	0.02	2008
Social support	46	0.04	2007	Self-esteem	22	0.02	2007
Medical Students	42	0.07	2011	learning pressure	21	0.02	2008
Motivation	38	0.07	2007	learning input	20	0.03	2006

These keywords basically summarize the hotspots in this research field, and it can be seen that in the research centered on “College Students' Learning Burnout”, the research mainly focuses on influencing factors, countermeasures and the current situation, as well as on variables such as professional commitment, psychological capital, social support, motivation to learn, self-esteem, learning pressure, and learning input. Related studies, in addition to medical students and higher vocational student groups tend to receive more attention.

3.5.2 Keyword clustering analysis

Select Node Types as “keyword”, due to the large amount of data, in order to filter out some unimportant nodes in the research network, but also in order to prevent overcrowding of the clustering map, so choose the “Pathfinder” pruning algorithm, and “Pruning the Merged Network” streamlining strategy, to run. The keywords of college students Learning Burnout clustering analysis, the results are shown in Figure 5. The data in the figure shows $Q=0.855$, which indicates that the clustering structure is significant ($Q>0.3$) and $S=0.959$, which indicates that the clustering is efficient and convincing ($S>0.7$). Based on this, the clustering labels of the keywords of Learning Burnout research among college students were extracted to form Table 5.

CiteSpace, v. 6.4.R1 (64-bit) Advanced
 December 18, 2024, 4:01:53 PM SGT
 CNKI: C:\Users\X\Desktop\CNK\data
 Timespan: 2004-2024 (Slice Length=1)
 Selection Criteria: g-index (k=5), LRF=2.5, L/N=10, LB=5, e=1.0
 Network: N=519, E=664 (Density=0.0049)
 Nodes Labeled: 1.0%
 Pruning: Pathfinder
 Modularity Q=0.855
 Weighted Mean Silhouette S=0.959
 Harmonic Mean(Q, S)=0.904
 Excluded:

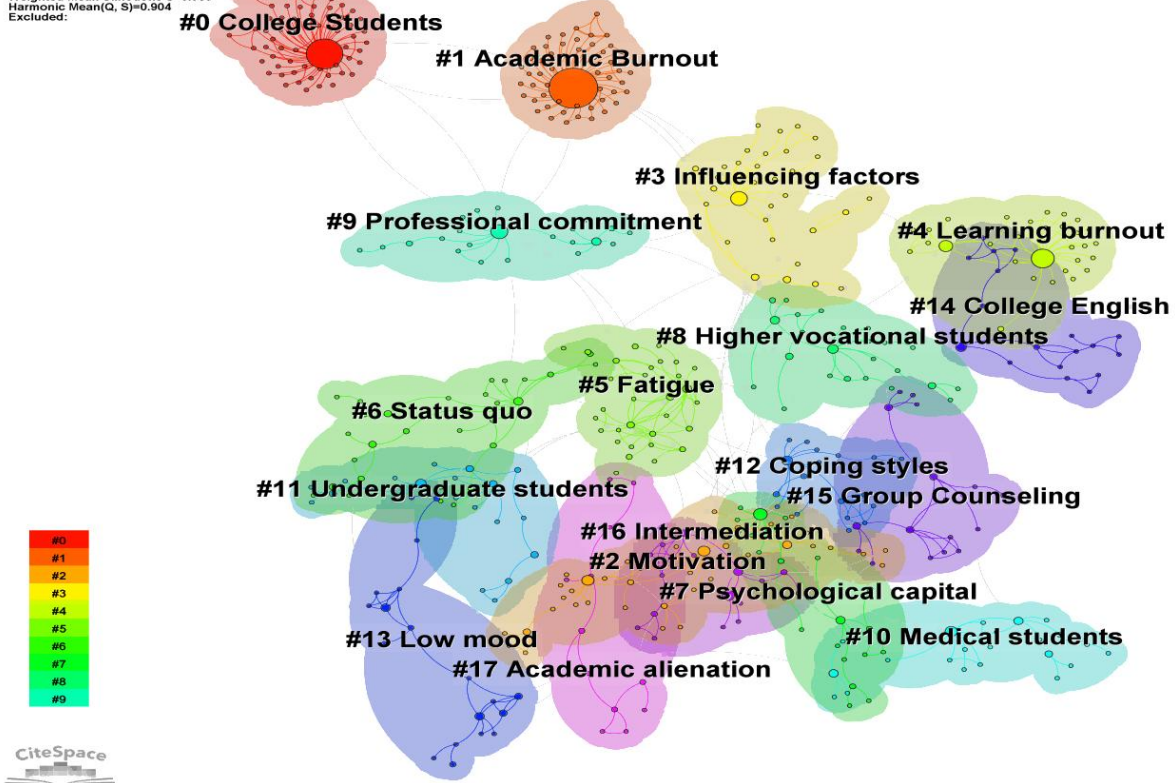


Figure 5 Keyword clustering map

Table 5 Major Learning Burnout Clusters and Corresponding Representative Keywords

Cluster Name	Mean (year)	Top Terms (LSI)
#0 College Students	2014	Resources, Current Status, Self-Directed Learning, Response to Intervention
#1 Academic burnout	2015	Influencing factors, career identity, post-secondary students, academic engagement
#2 Motivation	2012	Attributional style, academic performance, academic stress
#3 Influencing factors	2013	COVID-19 epidemic, depression, measurement, influences
#4 Learning Burnout	2013	Response, emotion regulation, academic achievement, perfectionism
#5 Fatigue	2012	Mental health, regression analysis, physical activity, learning disabilities
#6 Status quo	2012	Response analysis, coping strategies, research studies
#7 Psychological capital	2017	Cell phone addiction, stress perception, self-harmony, sleep quality
#8 Higher education students	2010	Interpersonal communication, academic motivation, root causes, cause analysis
#9 Professional commitment	2014	Learning engagement, new medical students, nursing education, nursing students
#10 Medical students	2017	Academic procrastination, mediation effects, online teaching and learning
#11 Undergraduate students	2014	Strengths analysis, preschool education, physical education
#12 Coping styles	2014	Online learning, related research, physical education learning
#13 Low mood	2012	Misbehavior, sense of achievement, physical education
#14 College English	2012	Solution countermeasures, helping learning mechanisms, guidance, working memory
#15 Group counseling	2013	Higher education, mental health, achievement attribution
#16 Intermediation	2013	Intervention studies, academic achievement, learning strategies, correlations
#17 Academic alienation	2009	Depersonalization, achievement

As can be seen from Figure 5 and Table 5, 17 significant clusters were formed for College Student Learning Burnout. Comparing the frequency of keyword co-occurrence analysis, the main research hotspot directions in the field of Learning Burnout among college students should also include: fatigue, undergraduate students, low mood, college English, group counseling, academic detachment and other directions.

By studying the keywords in the specific clusters, the research frontiers of College Student Learning Burnout can be reasoned out. First, the four clusters #0, #4, #6 and #14 together point to the current situation and countermeasure research on college students' Learning Burnout, in which the representative keywords of independent learning, emotion regulation, and helping mechanism illustrate that the coping strategy of solving the interventions is one of the hotspots and frontiers of the research on college students' Learning Burnout.

Secondly, the five clusters of #1, #2, #3, #8, and #15 together point to the analysis of influencing factors and attribution of college students' Learning Burnout problems, and the keywords of these clusters show that learning commitment, academic performance, academic pressure, COVID-19 epidemic, depression, interpersonal communication, learning motivation, and mental health are hot spots that are often explored in the attribution research.

Finally, the keywords of sports, cell phone addiction, sleep quality, academic procrastination, misbehavior, achievement, academic performance, and learning strategies in the five clusters of #5, #7, #10, #13, and #16 are not difficult to see, and collectively point to the study of college students' Learning Burnout correlations and the study of mediating effects, which is the focus of the research in this area.

In addition #8, #9, #10, #11 these clusters also jointly point to the concern groups of college students' Learning Burnout, which include representative groups such as higher vocational students, medical students, physical education majors, preschool education majors, etc., and also emphasize the specificity of Learning Burnout, reflecting that some scholars are concerned about the Learning Burnout of special college student groups.

3.6 Analysis of Research Trends Based on Keyword Burst and Clustered Time Zone Maps

3.6.1 Analysis of keyword bursts

In this study, the analysis of burst keywords is used to understand the cutting-edge dynamics of college students' Learning Burnout research, and then to grasp the future research direction. CiteSpace was used to generate a map of burst words for keywords, and Figure 6 shows the top 20 burst words, demonstrating the research hotspots, trends and cutting-edge dynamics within the time nodes.

Top 20 Keywords with the Strongest Citation Bursts

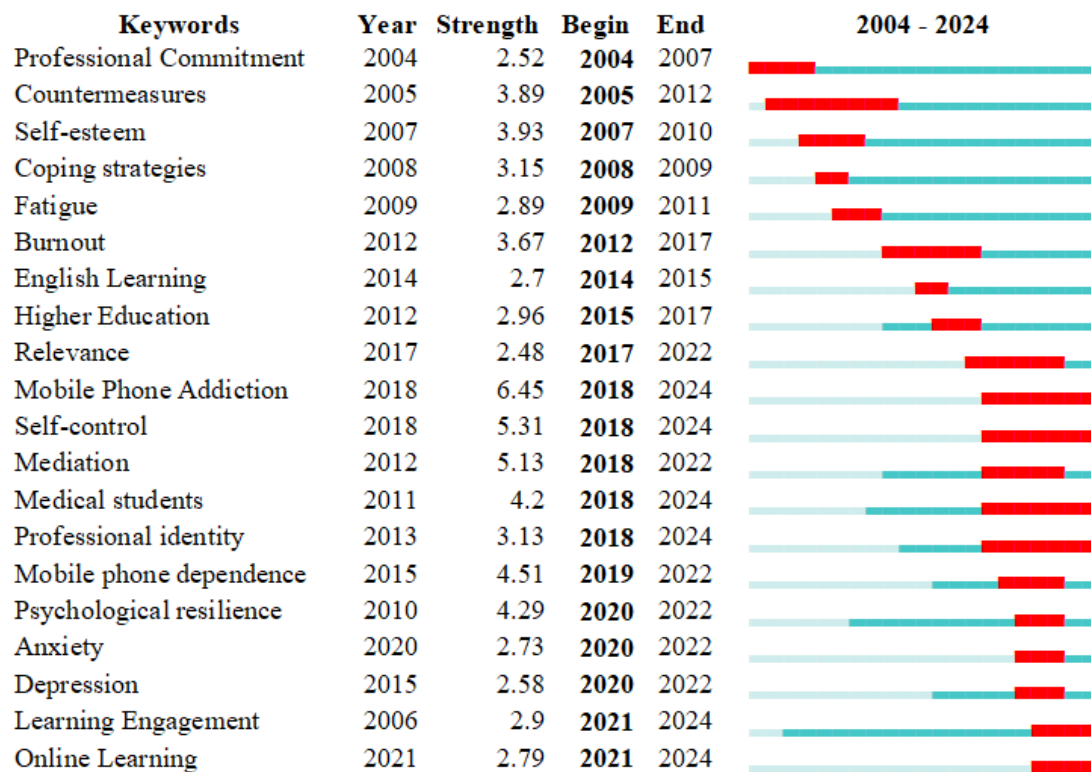


Figure 6 Keyword burst mapping

In terms of the intensity of the burst words, “cell phone addiction”, “self-control” and “mediation” ranked in the top three. This suggests that exploring the relationship between Learning Burnout and cell phone addiction and self-control, as well as studying the mediating factors of Learning Burnout among college students, is a cutting-edge topic in this field.

In terms of the time of burst, there is a large variation in the topics of research on Learning Burnout among college students, which is not unrelated to the fact that the relevant research spans more than 20 years. “Professional commitment,” “countermeasures,” “self-esteem,” “coping strategies,” “Fatigue” are the earlier burst words, which indicates that at the beginning, the research on Learning Burnout among college students mainly focused on countermeasure research. At the same time, many scholars began to pay attention to the influence of “professional commitment”, “self-esteem”, “fatigue” and other factors on Learning Burnout of college students, but then the related research faded out of the research field around 2011. And since 2018, a large number of new research hotspots have been included in this research field, “cell phone addiction” “self-control” “medical students” “Professional identity” “Psychological resilience” “Anxiety” “Depression” “Learning engagement” and “online learning” have entered the careers of more scholars as a new research focus and are still continuing.

3.6.2 Time zone analysis of keyword clustering

CiteSpace was used to generate a time zone mapping for keyword clustering, and after adjusting to retain high frequency keywords and some keywords in the last 4 years, the results are shown in Figure 7.

Figure 7 Keyword clustering time zone mapping

Time zone mapping can clearly present the distribution of hot spots of college students' Learning Burnout research in different time periods, and more clearly reflect the historical progress of the research. Since the study of college students' Learning Burnout was proposed in 2004, the preliminary period was mainly aimed at the study of influencing factors and measurement, and the development of high heat began from 2007 to 2014, with the emergence of research on status quo analysis, specific groups, and correlation. The heat gradually slowed down from 2015, and the research directions were still varied. Since COVID-19, the heat of the study was reduced again, but the research direction was obviously shifted to the direction of self-directed learning, network learning, online courses and other directions, and more emphasis has been placed on the study of psychological emotional changes, interpersonal interaction and other aspects.

The current gradual decline in the research heat of college students' Learning Burnout may not be that the related problems have been fundamentally solved, but rather that the scholars concerned have not yet fully resumed their research after the new COVID-19 epidemic, and that the traditional research ideas may have encountered challenges, which require researchers to change their research ideas, innovate their research design, and seek new breakthroughs in the midst of the predicament.

4 Conclusions and Recommendations

4.1 Conclusion

Based on the bibliometric analysis, this study reveals the research trends, hotspots and problems in this field through an in-depth analysis of college students' Learning Burnout research in multiple dimensions between 2004 and 2024, and the main conclusions are as follows.

First, the number of research articles shows a fluctuating trend. College students' Learning Burnout research began in 2004, and experienced four stages: preliminary exploration, rapid growth outbreak, steady development, and slow development with reduced heat. Especially after the COVID-19 epidemic, the heat of research decreased significantly, which may be related to the restricted academic environment caused by the epidemic.

Second, the output of high-quality journal papers is insufficient. Although core journals in the fields of psychology, medicine, and education have paid attention to Learning Burnout, the output of high-quality research papers still needs to be improved.

Third, the cooperation network of research institutions is loose. Although a number of research institution cooperation networks have been formed, the overall degree of cooperation is very weak, and the cooperation relationship is relatively decentralized, and a core research institution has not yet been formed.

Fourth, the author cooperation network is loose, and there is a lack of high-yield authors. The author group is large but the density of cooperation network is low, the number of high-yield authors is limited and cooperation is lacking, which is not conducive to the in-depth and sustainable development of research.

Fifth, the research hotspots are extensive but lack of depth. Keyword co-occurrence and clustering analysis shows that the research hotspots are extensive, including influencing factors, countermeasures, status quo, professional commitment, psychological capital, etc. However, some of the research lacks depth and fails to form a systematic theoretical framework.

Sixth, the research trend is affected by the COVID-19 epidemic. After the COVID-19 epidemic, the research direction shifted to independent learning, e-learning, online courses, etc., and emphasized the research on psychological-emotional changes, interpersonal interactions, etc., but the overall research heat declined.

4.2 Research limitations

Limited by the CNKI database literature searched in this study, CiteSpace is unable to analyze the citation relationship between the literature, and the analysis of the academic influence of the literature, authors, journals, and institutions will be slightly insufficient. In addition, only the Chinese literature in the CNKI database was included in this study, not the English literature, so the contribution of some non-Chinese authors may be underestimated, and may have a certain

impact on the results of the study, but given the large number of Chinese literature in the CNKI, the results presented in this study should be able to reflect the situation of the research on Learning Burnout among college students in the CNKI database to a certain extent. Or rather, it should reflect the situation of college students' Learning Burnout research in China.

4.2 Research limitations

Due to the limitations of the CNKI database literature searched in this study, CiteSpace is unable to analyze the citation relationship between the literature, and the analysis of the academic influence of literature, authors, journals, and institutions will be slightly insufficient; in addition, the CNKI database only includes Chinese literature, not English literature, so the contribution of some non-Chinese authors of the literature may be underestimated, which may also have a certain effect on the results of the study. However, given the large number of Chinese literature in CNKI, the results presented in this study should, to a certain extent, be able to faithfully reflect the situation of college students' Learning Burnout research in China, or the situation of college students' Learning Burnout research in the CNKI database.

4.3 Recommendations

Finally, in view of the problems existing in the current research on College Students' Learning Burnout, this study puts forward some suggestions for seeking breakthroughs and innovations in the future.

First, strengthen interdisciplinary cooperation and integration. Scholars with multidisciplinary backgrounds such as psychology, medicine, education, sociology, etc. are encouraged to strengthen cooperation and form interdisciplinary research teams to jointly explore the causes, effects and intervention strategies of Learning Burnout.

Second, to promote the output of high-quality research papers. Encourage scholars to pay attention to the cutting edge of research, adopt scientific research methods, improve the depth and breadth of research, and promote the output of high-quality research papers.

Third, to build a close cooperative network of research institutions. Strengthen the cooperation and exchange between research institutions, establish stable cooperative relationships, jointly undertake research projects, form core research institutions, and promote the in-depth development of the research field.

Fourth, promote cooperation and exchange among authors. Encourage cooperative research among authors to form a close cooperation network of authors and jointly promote the progress of the research field. At the same time, communication and interaction among scholars are strengthened through academic conferences and seminars.

Fifth, deepening research hotspots and expanding new fields. Based on the existing research hotspots, we will deepen the research on the causes, impacts and intervention strategies of

Learning Burnout, and at the same time expand new research areas, such as focusing on the impacts of emerging technologies on Learning Burnout, and exploring the issue of Learning Burnout in cross-cultural contexts.

Sixth, to deal with the challenges brought by the post epidemic era. The COVID-19 epidemic has brought many challenges to academic research, but it also provides new research opportunities. Future research should focus on the mechanism of the epidemic's impact on Learning Burnout and explore effective intervention strategies, as well as utilize online research tools and methods to promote the continuous development of research.

Seventh, promote the transformation and application of research results. Strengthen the combination of research results and practical application, transform research results into effective interventions and educational practices, improve the motivation and learning effect of college students, and contribute to the quality improvement of higher education.

References

- Andrade, D., Ribeiro, I., Prémusz, V., & Máté, O. (2023). Academic Burnout, Family Functionality, Perceived Social Support and Coping among Graduate Students during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, 20. <https://doi.org/10.3390/ijerph20064832>.
- Bali, O., Kaya, A., Sata, M., & Allen, K. (2024). Bibliometric Analysis of Studies on Academic Burnout in Students. *Journal of University Teaching and Learning Practice*. <https://doi.org/10.53761/e9jfv044>.
- Chen, Y., Chen, Chaomei, Liu, Zeyuan, Hu, Z. & Wang, Xianwen. (2015). Methodological functions of CiteSpace knowledge graph. *Research in Science* (02), 242-253. doi:10.16192/j.cnki.1003-2053.2015.02.009.
- Draghici, G., & Cazan, A. (2022). Burnout and Maladjustment Among Employed Students. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.825588>.
- Eseadi, C. (2022). An online counseling intervention for Nigerian undergraduates with academic burnout. *International Journal of Research in Counseling and Education*. <https://doi.org/10.24036/00514za0002>.
- He, J. & Hu, Y.. (2022). Status and Trends of English Learning Burnout Research from 2001-2022-Based on CiteSpace and Econometric Visualization Analysis. *Modern Information Technology* (16), 157-160. doi:10.19850/j.cnki.2096-4706.2022.16.041.
- Hou, Y. (2021). Research Progress of College Students' Learning Burnout. *Review of Educational Theory*. <https://doi.org/10.30564/RET.V4I4.3545>.

- Jiao, Yingzhen. (2021). Current situation and influencing factors of college students' academic burnout and intervention research. *Science and Technology Information* (03), 228-230. doi:10.16661/j.cnki.1672-3791.2009-5042-6259.
- Li, Bingzhong, Peng, Xiaohong & Feng, Yanzi. (2016). A Review of Domestic Learning Burnout Research - Statistics and Analysis Based on 29 CSSCI Journals' 10-Year (2005-2014) Papers. *Journal of Language and Literature (Foreign Language Education and Teaching)* (05), 114-116. doi:CNKI:SUN:YWWY.0.2016-05-044.
- Li, Q. H. & Xu, D. Z.. (2013). Bibliometric analysis of domestic Learning Burnout research in the past 20 years. *Xinjiang Vocational Education Research* (03), 56-59+92. doi:10.16455/j.cnki.65-1281/g4.2013.03.006.
- Lian, Rong, Yang, Li-Hsien & Wu, Lanhua. (2005). The Relationship and Scale Development of College Students' Professional Commitment, Learning Burnout. *Journal of Psychology* (05), 632-636. doi:CNKI:SUN:XLXB.0.2005-05-008.
- Lu, J. J., Wan, X. M.. (1994). Analysis of Learning Burnout of Higher Teacher Students. *Research on Higher Teacher Education* (01). doi:CNKI:SUN:GDSZ.0.1994-01-004.
- Lu, L. (2024). Investigation and Analysis on Learning Burnout of Local College Students in China. *Cross-Currents: An International Peer-Reviewed Journal on Humanities & Social Sciences*. <https://doi.org/10.36344/ccijhss.2024.v10i08.003>.
- Ma, Li, He, Chen, Hai Lei Shan & Xian Chuan Yang. (2023). Research Status, Hot Spots and Evolution of Learning Burnout - A CiteSpace-based Bibliometric Analysis. *Vocational Education* (35), 35-40+76. doi:CNKI:SUN:ZDZJ.0.2023-35-007.
- Madigan, D., & Curran, T. (2020). Does Burnout Affect Academic Achievement? A Meta-Analysis of over 100,000 Students. *Educational Psychology Review*, 33, 387 - 405. <https://doi.org/10.1007/s10648-020-09533-1>.
- Messina, I., Rossi, T., Bonaiuto, F., Granieri, G., Cardinali, P., Petruccelli, I., Maniglio, R., Loconsole, C., & Spataro, P. (2024). Group psychological counseling to contrast academic burnout: a research protocol for a randomized controlled trial. *Frontiers in Psychology*, 15. <https://doi.org/10.3389/fpsyg.2024.1400882>.
- Morando, M., Smeriglio, R., Maggio, C., Di Nuovo, S., & Platania, S. (2023). Incidence and occurrence of academic burnout: The impact of personality, self-efficacy and self-esteem and post-pandemic effects. *Environment and Social Psychology*. <https://doi.org/10.54517/esp.v8i2.1684>.
- Ojo, E., Onwuegbuzie, A., Bergsteedt, B., Adams, S., Crowley, T., & Burger, A. (2023). A Meta-Methods Analysis of Academics' Challenges Affecting Research Productivity During

COVID-19: Insights from a South African University. *Journal of Higher Education Theory and Practice*. <https://doi.org/10.33423/jhetp.v23i5.5923>.

Reyes-De-Cózar, S., Merino-Cajaraville, A., & Salguero-Pazos, M. (2023). Avoiding Academic Burnout: Academic Factors That Enhance University Student Engagement. *Behavioral Sciences*, 13. <https://doi.org/10.3390/bs13120989>.

Supriyanto, A., Imtinan, S., Arikunto, S., Handaka, I., & Hartini, S. (2024). ACADEMIC BURNOUT CONDITIONS IN INDONESIAN STUDENTS: PHYSICAL, MENTAL, AND EMOTIONAL. *EDUCATIONE*. <https://doi.org/10.59397/edu.v2i2.26>.

Volpe, M., Ralli, M., & Isidori, A. (2024). "The impact of the COVID-19 pandemic on research activities: A survey of the largest Italian academic community". *PLOS ONE*, 19. <https://doi.org/10.1371/journal.pone.0304078>.

Wang, Chengqing & Cui, L. C.. (2017). A Bibliometric Analysis of the Current Status of Research on Learning Burnout in China. *Mental Health Education in Primary and Secondary Schools* (20), 8-11. doi:CNKI:SUN:ZXXK.0.2017-20-003.

Yang, Li-Hsien, Lian, Rong. (2005). Research Status and Prospects of Learning Burnout. *Journal of Jimei University (Educational Science Edition)*(02), 54-58. doi:CNKI:SUN:JMDX.0.2005-02-010.

Yang, Li-Hsien. (2004). *Research on the Current Status of College Students' Learning Burnout and Its Relationship with Professional Commitment* (Master's thesis, Fujian Normal University). <https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD9904&filename=2004095080.nh>

Yimai Wang, Xiaoyu Liu, Zhiyun Huang, Xiangyi Wang & Mengyun Wang. (2021). The current situation and hotspots of domestic learning input research - Based on CiteSpace visualization analysis. *Journal of Guangxi Radio and Television University* (03), 9-16. doi:CNKI:SUN:GBDS.0.2021-03-003.

Yuan Qinqin. (2017). Status of Research on Learning Burnout of Higher Vocational Students in Recent Years-Based on Statistical Analysis of CNKI Literature. *Vocational Education Newsletter* (16), 12-18. doi:CNKI:SUN:ZJTX.0.2017-16-005.

Zhu, Leiye Zhu, Junhua Xu & Haibin Wang. (2019). Current Status and Prospects of Mobile Phone Dependence Research in China - Based on Bibliometrics and CiteSpace Analysis. *Journal of Chengdu Normal University* (07), 53-60. doi:CNKI:SUN:SJXB.0.2019-07-010.