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## Article

# Bibliometric review on factors influencing consumers' intention to purchase electric vehicles

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# Bibliometric review on factors influencing consumers' intention to purchase electric vehicles

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## ABSTRACT

The prevailing global emission pollution dilemma necessitates a sustainable alternative to gasoline-powered automobiles, with electric vehicles serving as a viable option. The shift from petrol to electric cars (EVs) poses a challenge for expanding markets like Malaysia. The Malaysian Automobile Association reported that electric vehicle sales in Malaysia for 2023 totaled 13,257 units. This study examines studies on determinants that affect consumers' intention to acquire electric vehicles. Subsequently, analyzed information regarding the determinants affecting Malaysian customers' propensity to acquire electric vehicles in order to assess prevailing trends. Thirty-six articles published between 2016 and 2023 were extracted from the Scopus databases. The investigation was conducted via bibliometric analysis utilizing VOSviewer software. The subsequent conventional bibliometric indicators employed were: publication year, source type, language, subject area, keyword analysis, geographical distribution, and author citation analysis. Keyword analysis and publication patterns suggest that the determinants affecting consumers' propensity to acquire electric vehicles represent a viable subject for future research.

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Supply Chain  
Management;  
Manufacturing Industries;  
Road Vehicle  
Manufacturing Industry

## 1. Introduction

Now that global carbon emissions are increasing, more environmental protection measures need to be taken to ensure that the environment will not deteriorate; therefore, promoting the adoption of electric vehicles (EVs) is a powerful measure. Fossil fuel combustion is a major contributor to global warming and, if checked, could result in catastrophic climate change (Alanazi, 2023). The environment, economy, and society are all negatively affected by the consumption of petroleum carried by internal combustion engine vehicles (ICEVs), in addition to their contribution to greenhouse gas (GHG) emissions (Broadbent et al., 2021).

Unlike their gasoline-powered counterparts, electric vehicles operate primarily on electricity stored in advanced battery systems, producing zero tailpipe emissions during operation. This fundamental distinction positions EVs as key players in the transition toward a more sustainable and eco-friendly transportation ecosystem. The adoption of electric vehicles is not merely a technological trend but a strategic response to the urgent need for cleaner modes of mobility.

### 1.1. According to the Malaysian Automobile Association (MAA) Malaysian Automotive Association, Malaysian Automotive Association (2023), Malaysia electric vehicle sales in 2023 were only 13,257 units

In comparison, the country's total vehicle sales are approximately 720,000 units, with the former accounting for only 1.8%. The Malaysian electric vehicle market is relatively new compared to other countries

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and regions, so research on Malaysian consumers' purchase intentions for electric vehicles can help local automobile manufacturing companies and dealers better understand Malaysian consumers' purchase preferences for vehicles. Recently, an increasing number of automakers, including well-known brands like Volkswagen and BMW, have declared that they will accelerate the process of electrifying their vehicles. Scientists have been steadily expanding their studies in this area (Lim et al., 2019).

The average consumer has limited knowledge about electric vehicles, even with the significant growth in the literature in these areas (e.g. battery technology, charging technology, and assisted driving technology). Therefore, this study conducts a bibliometric review of past studies to discover and understand this aspect of electric vehicle purchase intention. Databases related to this topic were explored by searching for documents accessible in Scopus journals. The findings of this study will aid other researchers in formulating concepts for future research projects and in comprehending patterns in earlier research.

The remainder of this paper is organized as follows. Section 2 examines earlier studies on the variables that have a major impact on consumers' intentions to buy electric cars. The data sources, data collection, and data analysis for this experiment are presented in Section 3. The outcomes of the bibliometric analysis are presented in Section 4. The results are outlined in Chapter 5 along with suggestions for future studies.

## 2. Literature review

### 2.1. Bibliometric analysis

Bibliometric analysis is widely employed to evaluate the quantity and caliber of published works to identify patterns or trends within a specific field of study (Suchart & Pornpawee, 2022). The use of bibliometric analysis to report research trends and impacts is becoming more widespread. The most common categories of bibliometric indicators are country, authorship, citations, impact, and publication classification (Ahmi & Mohamad, 2019).

Bibliometric analysis constructs a statistical model to describe the field's structure and pinpoints major themes and current linkages, such as those found in clusters and networks (Ahmi & Mohamad, 2019). Understanding the structure of networks is the goal of both networks and clusters; bibliometric and scientometric studies frequently combine these two approaches. A critical assessment of the study will be made easier through the comprehensive analysis of the research trajectory.

### 2.2. Previous studies

Most of the previous studies on electric vehicle purchase intention started based on consumers' subjective feelings. Faizah et al.'s study (2023) applying the expanded unified theory of acceptance and use of technology (UTAUT) and religious beliefs will clarify the extent to which technological factors, personal factors, and religious beliefs influence EV intentions and adoption. Some articles mention the impact of environmental awareness and sustainability (Adnan et al., 2017; Afroz et al., 2015; Amin et al., 2020; Amr et al., 2023; F. C. Liao et al., 2017; Schuitema et al., 2013; Siyal et al., 2021). Some scholars believe that brand effect also has a great impact on consumers' purchase intention. When consumers do not recognize a new brand, they will most likely not buy it because they do not want to take perceived risks (Akmal & Sharifah, 2019; Gunawan et al., 2022; Jiang et al., 2021; Liu et al., 2020; Nguyen, 2020; Rezvani et al., 2015; Thean et al., 2023; Thilina & Nisal, 2019). Other consumers who have owned gasoline cars will first consider the performance and reliability of electric cars before deciding on their purchase (Habich-Sobiegalia et al., 2019; Jensen et al., 2019; Liu et al., 2020; Trivedi & Kishore, 2020).

The next step is to study from the perspective of financial policy. According to the findings of (Adhikari et al., 2020) the relatively high purchase price of electric vehicles compared to internal combustion vehicles and inadequate long-term planning and goal setting by the government were listed as obstacles to the popularization of electric vehicles in Nepal. Study (Anil et al., 2020), based on sensitivity analysis, shows that changes in the various components of operating costs have a significant impact on the cumulative ownership cost of electric vehicles, resulting in electric vehicle prices not falling too quickly. Moreover, most research incentive policies such as subsidies have a significant

positive impact on consumers' purchase intention of electric vehicles (Chu & Mohamed, 2022; Huang & Ge, 2019; Ivanova & Moreira, 2023; Li et al., 2019; Mustapa et al., 2020; Nidal, 2020; J. W. Wang et al., 2020).

Nowadays, the global demand for electric vehicles is increasing, and the degree of construction of supporting facilities such as charging stations is also an important factor that consumers need to consider before purchasing electric vehicles. Several studies have demonstrated that the availability of charging facilities has a positive impact on consumer attitudes and purchase intention (Broadbent et al., 2018; Dong et al., 2020; Dutta & Hwang, 2021; Julio et al., 2021; S. Wang et al., 2017). The study (Asensio et al., 2021) further examines how to optimize charging station power dispatch to attract more consumers.

Of course, researchers start from an institutional perspective and use customer-centered sustainable development methods to promote restrained consumption (K. Y. Liao et al., 2020; Sheth et al., 2011).

Many previous studies have reviewed EV purchase intentions and EV technology using literature reviews. Each paper presents a conclusion analysis from a different perspective, but they all show the factors that influence consumers to purchase electric vehicles. Study (Amin et al., 2020) reviewed the impact of optimal charging and dispatching of electric vehicles on consumers' use of electric vehicles under dynamic pricing schemes. Study (Ivanova & Moreira, 2023) was based on a systematic literature review of 63 articles published between 1994 and 2021. The antecedents of electric vehicle purchase intention are divided into three categories: consumer characteristics, electric vehicle characteristics, and electric vehicle-related policies. In addition (Muzir et al., 2022), reviewed the challenges related to the implementation of EV culture in Malaysia are thoroughly examined, including the Malaysian government, policymakers, and EV manufacturers. However, none of these studies used bibliometric analysis to review the prior literature.

Therefore, in this study, bibliometric analysis was conducted to address the following questions:

- i. What are the journal's most common/popular research topics?
- ii. Which countries and regions are most popular for publishing articles on related topics?
- iii. Which journals do researchers prefer to publish, and which journals have the most citations?

Table 1 presents a selection of prior research on the factors influencing the purchase intention of electric vehicles, in addition to bibliometric studies on the subject. There has been more research on this subject since January 2024. In general, there is a dearth of bibliometric analyses regarding the intentions to purchase electric vehicles. Thus, to help researchers identify gaps in the literature and important topics, this article offers a thorough review of the factors influencing EV purchase intention. This will enable future studies to focus on promising research areas.

**Table 1.** Summary of previous studies.

Author	The aim of the paper	Methodology	Key findings
Habich-Sobiegalla et al. (2019)	To examine the factors of Chinese citizens' intentions to adopt EVs	A web-based SP survey; Ordered logit regression	Consumers will be much more likely to purchase an electric car if they have a large social network and know people who already own one. To a lesser degree, other descriptive factors like age and education also have notable effects.
Sovacool et al. (2019)	To determine the factors associated with potential EV adoption	A web-based SP survey; regression and principal component analysis	The desire to purchase electric vehicles is influenced by three factors: policy support for promoting electric vehicles, the perceived advantages of driving an electric vehicle, and the performance of electric vehicles.
Ling et al. (2021)	To determine the factors that influence electric vehicle adoption	A web-based SP survey	The greater the willingness to purchase electric vehicles (PHEVs and BEVs), the higher the male and household income.
Tu and Yang (2019)	To investigate key factors influencing consumer to purchase electric vehicles	Questionnaires, Using Cronbach's $\alpha$ to measure	Consumers' environmental awareness and acceptance of technological products will also affect their behavioral intentions, or they will be more inclined to purchase electric vehicles when they think they are simpler and more convenient to use. The perceptions of those around consumers also significantly influence their behavioral intentions.

These studies investigated relatively mature EV markets such as China and European countries. In this study, the author focuses on the Malaysian EV market, and the previous research variables are different from this research. For instance, Ling et al. (2021) investigated male and household income levels as influencing factors and Habich-Sobieggalla et al. (2019) examined whether social networks can significantly influence consumers' purchase intentions.

Overall, there is a lack of bibliometric analysis of EV purchase intention in the current literature, especially with regard to Malaysian consumers. Therefore, this study provides an in-depth and up-to-date review of the research on EV purchase intention, which will enable researchers to identify gaps in the literature and key topics.

### 3. Methodology

#### 3.1. Data source

A comprehensive analysis of bibliographic material was conducted using the core collection of the Scopus database to identify trends, impacts, and consequence themes of research related to electric vehicle purchase intention. First, it is widely regarded as the largest database covering a comprehensive range of scholarly works, with over 19 million author records and 2.4 billion citations. Second, Scopus covers a range of interrelated disciplines such as social sciences, engineering, and business. Thus, the Scopus database has been identified as a reliable and comprehensive resource for quantitative scientific research.

#### 3.2. Data collection

To collect information from the Scopus database, researchers must record it in three steps according to the following requirements: 1. Topics: What the expert is interested in researching, scope: database type, search field, string; 2. Screening - time range and qualifications, after keyword search (n); 3. Included – data document analysis that will be used. Figure 1 shows the flow chart used in this study.

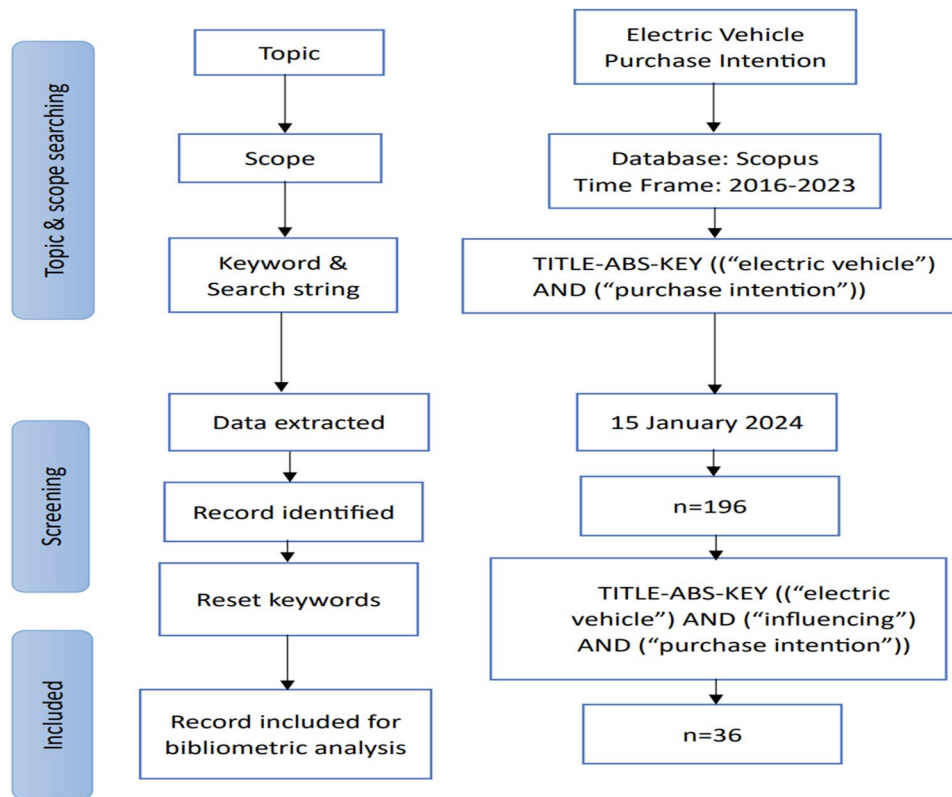
The topic covered in this study was the purchase intention of EVs. Using the search query 'TITLE-ABS-KEY (("electric vehicle") AND ("purchase intention"))', the information required for this study is as follows: Scopus; time frame: 1996–2023; number of documents: 196. Then, the keywords are reset using the search query 'TITLE-ABS-KEY (("electric vehicle") AND ("influencing") AND ("purchase intention"))', identified records and  $n=36$ , Time frame: 2016–2023. From the Scopus database before January 15, 2024, the files included publications from 2016 to 2023, with the exception of data for 2024 because there was not enough data published in that year to represent research trends in 2024. Furthermore, the study specifically focuses on engineering, social sciences, business, management, environment, and decision science. Consequently, 36 documents were selected for further analysis using search-related keywords.

#### 3.3. Data analysis

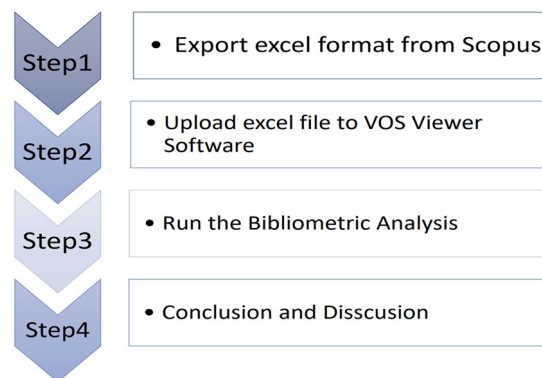
To ensure that the data were accurate, the 36 papers chosen for bibliometric analysis must be confirmed. Erroneous conclusions can result from inaccurate data; examples include different authors publishing in the same journal, using wrong keywords, etc. Because there was not much data in this study, it is possible to manually examine the data. The authenticity of numerous components, including author names, publication counts, affiliations, nationalities, keywords, and document titles, were extensively examined to confirm the data.

A basic bibliometric analysis was conducted during the survey. The purpose of the data analysis was to identify publication trends, assess impact, and investigate the impact of publications on research in the field of electric vehicle purchase intention. Figure 2 illustrates the bibliometric analysis.

The VOS Viewer software can utilize the CSV files of the Scopus database to visualize network co-occurrences, examine the impact of publications, and conceptualize, visualize, and create affiliated



**Figure 1.** Search flow chart.



**Figure 2.** Bibliometric analysis process.

networks. Finally, citation metrics are one way to measure the quality of research by examining how often it is cited; the higher the number of citations, the more influential the research is likely to be. With citations, you can examine the most influential articles in the field of study to understand the research topic.

#### 4. Result

The Scopus database was used to analyze growth, document and source type, language, geographical distribution, subject area, keyword analysis, author citations, active institutions, and citation analysis by year and year of publication. The results are presented in frequency and percentage forms. This study uses VOS Viewer software's co-authorship analysis, co-occurrence analysis, and citation analysis to visualize these data. This chapter provides an overview of the results from the bibliometric analysis using the Scopus database to answer the research questions.



#### 4.1. Publication by year and publication trend

Over the past 8 years, 36 research studies related to the topic of factors influencing the intention to purchase electric vehicles been published; the number of documents collected each year is shown in Table 2. The table shows the factors influencing the intention to purchase electric vehicles this area from 2016 to 2023. Study (Z. Wang & Dong, 2016) published the first paper in 2016, and the latest publication by Putra et al. (2023) in 2023.

Based on the data in Table 2, Figure 3 shows the research trends in this field. Until 2020, only a few articles were published each year and, none were published in 2017. However, after 2020, the overall research trend is upward, with an increase each year. This indicates that this research topic has received increasing attention. In 2020, most of the traditional car companies announced that their future business direction will shift to electric cars including BMW, Volkswagen, and other European car companies, and released their time to stop developing gasoline cars. By far the highest number of papers on willingness to purchase an electric vehicle is 2023, with 12 publications, or one-third of the total number of papers.

#### 4.2. Geographical distribution of publication and documents' language

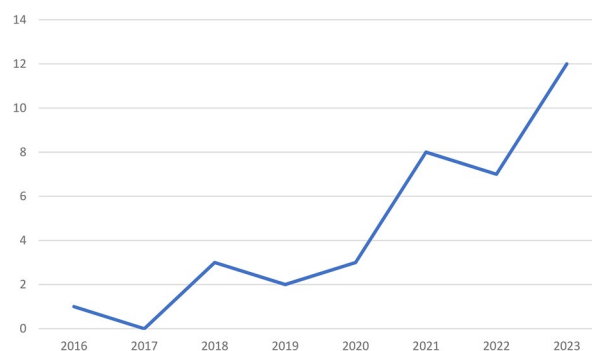
This section counts the number of publications categorized by country/region of authorship based on CSV files. The Scopus database shows that scholars from 16 countries have contributed to the body of knowledge on the factors influencing electric vehicle purchase intentions. Table 3 summarizes the top 10 countries with the most publications on this topic in the Scopus database.

Table 3 shows that the research results on reverse logistics and sustainability are mainly concentrated in China (38.89%), India (19.44%), Indonesia (5.56%), Malaysia (5.56%) and Saudi Arabia (5.56%). The total number of citations China (758), India (195) and Indonesia (129) are the three most cited countries. In fact, Malaysian articles also had a good number of citations, only 3 less than Indonesia. The reason for the highest number of articles from China is that the EV market in China has been the most competitive in the world in recent years, and there are many factors that influence Chinese consumers to purchase EVs. The dominance of the number of citations reflects China's huge investment in research on EV technology, or else Tesla, the giant, wouldn't have built its Gigafactory in Shanghai.

Here, the term 'document language' refers to the specific language used by a document to convey information. Most documents are in English, which facilitates communication and collaboration between

**Table 2.** Publication on factors influencing intention to purchase EV.

Year	Total publication	%
2016	1	2.78%
2017	0	0
2018	3	8.33%
2019	2	5.56%
2020	3	8.33%
2021	8	22.22%
2022	7	19.44%
2023	12	33.33%



**Figure 3.** Publication trend (Source: Scopus).



**Table 3.** Top 10 countries/region with the highest publication.

Country/ territory	Total publication	%	Total citation
China	14	38.89%	758
India	7	19.44%	195
Indonesia	2	5.56%	129
Malaysia	2	5.56%	126
Saudi Arabia	2	5.56%	118
Taiwan	2	5.56%	57
Thailand	2	5.56%	22
United States	2	5.56%	0
Viet Nam	1	2.78%	118
Ghana	1	2.78%	14

**Table 4.** Documents' language.

Language	Total publication	%
English	36	100

**Table 5.** Subject area covered in factors influencing electric vehicle purchase intentions.

Subject area	Total publication	%
Environmental Science	18	19.15%
Engineering	17	18.09%
Energy	15	15.96%
Social Sciences	15	15.96%
Computer Science	11	11.70%
Business, Management and Accounting	9	9.57%
Decision Sciences	3	3.20%
Economics, Econometrics and Finance	3	3.20%
Mathematics	2	2.13%
Earth and Planetary Sciences	1	1.06%

researchers. This was also true for the data in this bibliometric analysis, where all 36 articles were written in English. The results are presented in [Table 4](#).

### 4.3. Subject area and document types

Current publishing patterns can also be found through subject area analysis. This investigation is predicated on the documents that were chosen for this analysis and were grouped based on the field of study that the titles of the sources in which they were published indicated. From the 36 documents gathered, 10 subject areas were identified, as indicated in [Table 5](#). Environmental Science (19.15%), Engineering (18.09%), Energy (15.96%) and Social Sciences (15.96%) are the major subject areas. However, engineering was not directly related to the main focus of this study. On the other hand, Environmental Sciences, Business, Management and Accounting, Decision Science, and Energy are directly connected to the research field's primary focus.

The Scopus database to be a useful tool for researchers in all fields to access a wide range of scholarly information, focusing on peer-reviewed sources to ensure the quality and reliability of the indexed content. Document types were used to analyze documents extracted from the Scopus database. Document types included published papers, conference papers, reviews, books, book chapters, editorials, and others. [Table 6](#) summarizes the document-type analyses. Published articles accounted for more than half (75%) of the factors influencing the intention to purchase electric vehicles papers, followed by conference papers (19.44%), book chapters (2.78%), and conference reviews (2.78%).

### 4.4. Citation analysis of articles

Citation analysis provides a thorough evaluation of the most significant and extensive body of the literature. [Table 7](#) displays the top 10 of the 36 articles along with the number of citations for each article. Researchers can verify the relevance of a publication within a particular field of study by counting the number of citations it receives. This helps to determine the impact of a publication. The density of these publications, which is based on the number of links, supports citations, and it is through the analysis of this density that the relationships between specific articles are revealed.

**Table 6.** Document types.

Document type	Total publication	%
Article	27	75.00%
Conference Paper	7	19.44%
Book Chapter	1	2.78%
Conference Review	1	2.78%

**Table 7.** Top 10 cited publication based on citation analysis.

Author	Title	Citation
Lin and Wu (2018)	Why people want to buy electric vehicle: An empirical study in first-tier cities of China	219
Huang and Ge (2019)	Electric vehicle development in Beijing: An analysis of consumer purchase intention	184
Singh et al. (2020)	A review and simple meta-analysis of factors influencing adoption of electric vehicles	132
Zhang et al. (2018)	Is subsidized electric vehicles adoption sustainable: Consumers' perceptions and motivation toward incentive policies, environmental benefits, and risks	128
Asadi et al. (2021)	Factors impacting consumers' intention toward adoption of electric vehicles in Malaysia	118
Dong et al. (2020)	Urban households' purchase intentions for pure electric vehicles under subsidy contexts in China: Do cost factors matter?	57
Ouyang et al. (2021)	The total cost of electric vehicle ownership: A consumer-oriented study of China's post-subsidy era	52
Krishnan and Koshy (2021)	Evaluating the factors influencing purchase intention of electric vehicles in households owning conventional vehicles	50
Z. Wang and Dong, 2016	Determinants and policy implications of residents, new energy vehicle purchases: the evidence from China	44
Lin and Shi (2022)	Do environmental quality and policy changes affect the evolution of consumers' intentions to buy new energy vehicles	43

According to the data shown in Table 7, each of the top 5 articles gained over 100 citations, and they play an important role in this field. Lin and Wu's research reached 219 citations (Lin & Wu, 2018). They published a paper in 2018 that is still timely and referential. Surprisingly, an article about Malaysian consumers' intention to purchase electric vehicles also had 118 citations (Asadi et al., 2021). This shows that Malaysian research in this field has a certain degree of influence. The effects of these publications on knowledge mapping are shown in Figure 4.

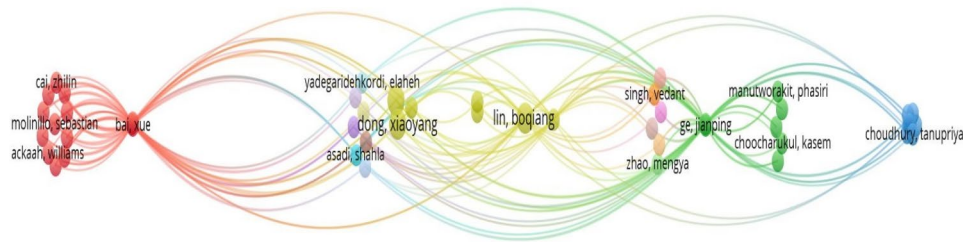
#### 4.5. Citation of journals

Examining the relationships between citations within a dataset of academic literature is known as citation analysis of journals in the VOS viewer. These citation patterns are visualized and explorable with the help of the bibliometric analysis tool VOS viewer. Researchers can identify which journals are highly cited and regarded as influential by other journals in the field by examining how frequently a journal is cited. Furthermore, citation analysis aids in locating core journals that receive numerous citations from other journals. These fundamental journals are valuable information sources and are essential for the sharing of knowledge within a given field. As can be seen in Table 8, this analysis was able to identify the ten leading papers with the highest citations.

As shown in Table 8, the journal that publishes the most articles is Sustainability (Switzerland), with 5 articles published between 2016-2023. However, the most cited journal is the Journal of Clean Production, with 430 citations in total. Journal of Cleaner Production is an international interdisciplinary journal that focuses on cleaner production, environment, and sustainability research and practice. The topic of purchase intention of electric vehicles fits well with this 'core' journal, and the article by (Asadi et al., 2021) on Malaysian consumers was also published in this journal, indicating that this journal is authoritative in this research field. Figure 5 shows the knowledge mapping of journal analysis in citation analysis.

#### 4.6. Co-occurrence analysis of keywords

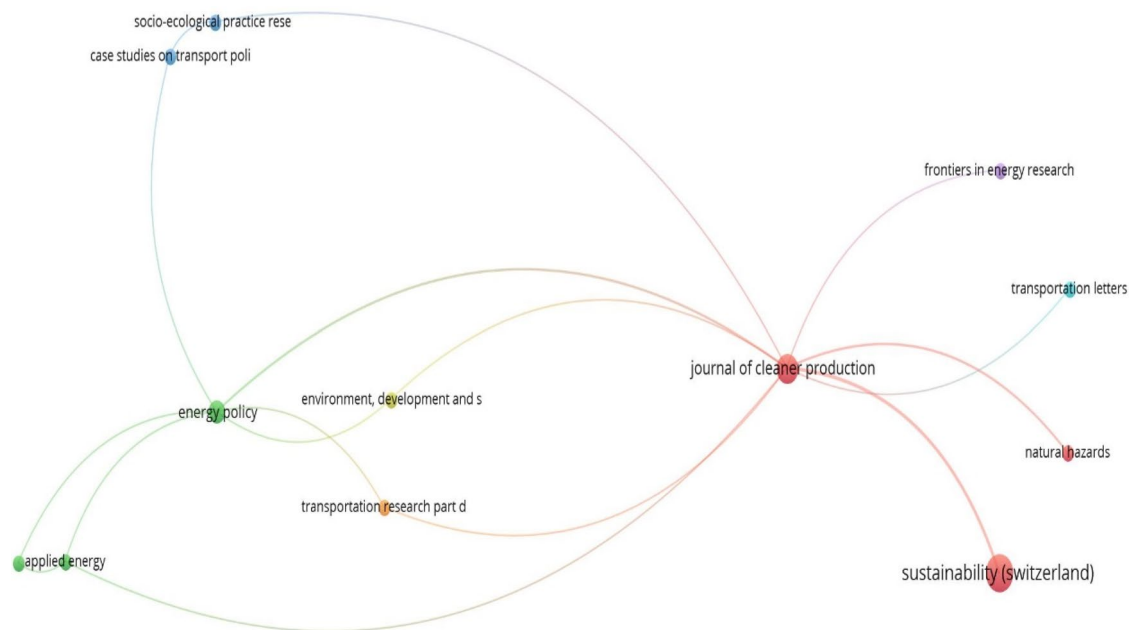
There were 335 keywords in 36 papers, and only 12 keywords appeared at least five times. Six clusters were generated based on the results of co-occurrence analysis. The results identified the top 10 keywords with the highest occurrence keywords: purchase intention (22), electric vehicles (22), electric vehicle (17), sales (16), purchasing (15), new energy vehicle (7), China (6), theory of planned behavior (6),



**Figure 4.** Author analysis in citation analysis (Source: VOS viewer).

**Table 8.** Top 10 published journals.

Journal	Total publication	Total citation
Sustainability (Switzerland)	5	130
Journal Of Cleaner Production	3	430
Energy Policy	2	270
Lecture Notes in Networks and Systems	2	0
ACM International Conference Proceeding Series	1	0
Applied Energy	1	42
Business Strategy and Development	1	0
Case Studies on Transport Policy	1	49
Energy Environment and Sustainability	1	0
Energy Reports	1	4



**Figure 5.** Journal analysis in citation analysis (Source: VOS viewer).

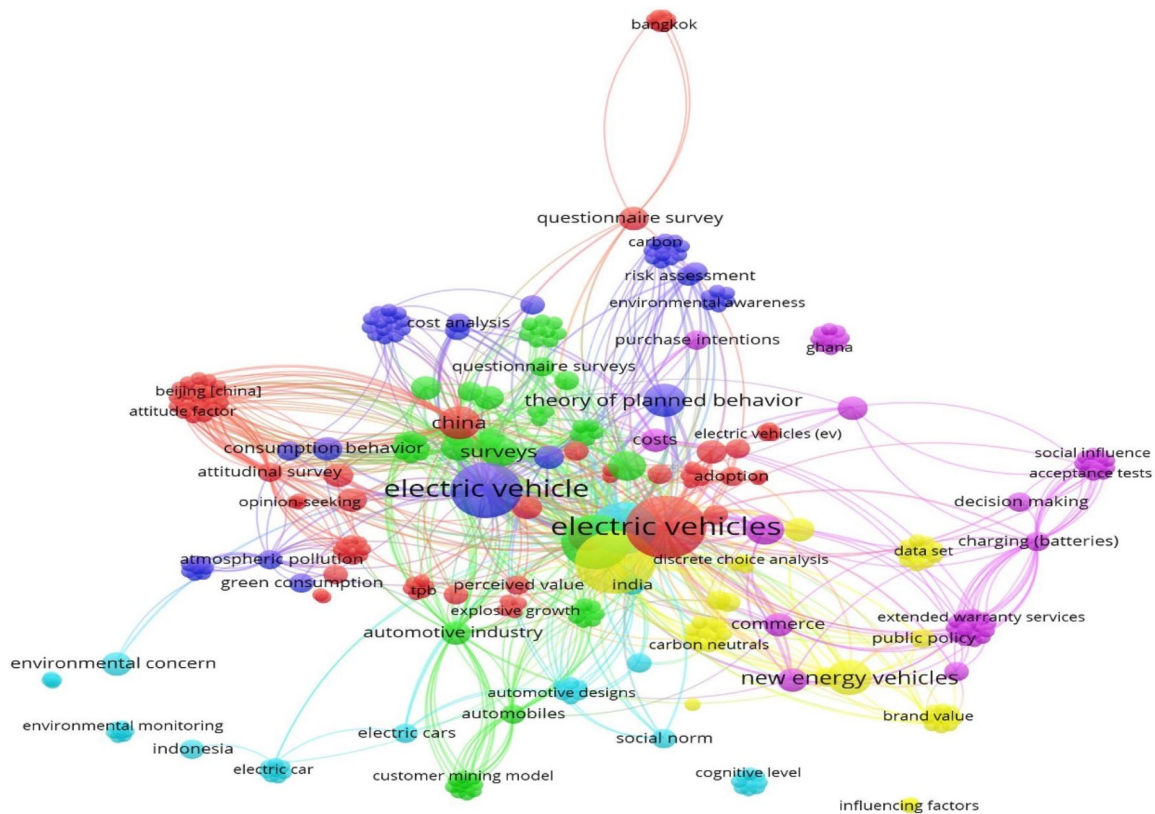
structural equation modeling (5), and consumer behavior (5). Table 9 shows the total strength of the links between these keywords.

Figure 6 displays the network mapping of the co-occurrence of the six clusters based on keyword analysis. The clusters were distinguished using the color and link strength between the keywords. The author's viewpoint was examined after categorizing the keywords into six clusters. The network diagram illustrates how closely related clusters are to one another, and how they form a network of clusters that traverse the network. Table 10 summarizes the keyword occurrences based on representation and clustering. The labels and explanations for each of the six clusters are given below.

Cluster red includes 85 keywords, 'Electric vehicles,' 'Questionnaire survey,' 'China,' 'adoption,' and 'attitude factor' which are the best match this cluster's concept. Based on these keywords, this cluster's theme focused on EV adoption in China using a survey/questionnaire.

**Table 9.** Top 10 keywords in co-occurrence analysis.

Keyword	Occurrences	Link strength
Purchase intention	22	340
Electric vehicles	22	338
Electric vehicle	17	297
Sales	16	295
Purchasing	15	273
New energy vehicles	7	105
China	6	113
Theory of planned behavior	6	99
Structural equation modeling	5	110
Consumer behavior	5	99

**Figure 6.** Keyword analysis in co-occurrence analysis (Source: VOS viewer).**Table 10.** Summary of keywords in co-occurrence analysis.

Cluster	Number of keywords	Representative keywords
Cluster red	85	Electric vehicles, questionnaire survey, China, adoption, attitude factor
Cluster green	61	Sales, surveys, behavioral research, automobile industry, electric automobile
Cluster purple	53	Electric vehicle, theory of planned behavior, consumption behavior, factor analysis, cost analysis
Cluster yellow	47	Purchase intention, new energy vehicles, policy approach, policy implementation, influencing factors
Cluster pink	47	Sustainable development, consumer behavior, decision making, charging (batteries), consumer purchase
Cluster blue	42	Purchasing, electric cars, environmental concern, social norm, electric car

Cluster green is comprised of 61 keywords and 'Sales,' 'surveys,' 'behavioral research,' 'automobile industry,' and 'electric automobile' are highlighted in this cluster. The cluster's central idea is behavioral research on sales in the automotive industry using surveys to collect data.

The purple cluster contained 53 keywords. The representative keywords are 'Electric vehicle,' 'theory of planned behavior,' 'consumption behavior,' 'factor analysis,' and 'cost analysis.' This cluster is closer to the topic of factors contributing to the intention to purchase EV.

Cluster yellow comprises 47 keywords, and its representative keywords are 'Purchase intention,' 'new energy vehicles,' 'policy approach,' 'policy implementation,' and 'influencing factors.' This cluster's main concept is the purchase intention of electric vehicles is affected by the implementation of relevant policies.

Cluster pink consists of 47 keywords. 'Sustainable development,' 'consumer behavior,' 'decision making,' 'charging (batteries),' and 'consumer purchase' are the keywords that best reflect this concept. This cluster's central idea is to consider whether (battery) charging is sustainable before purchasing, based on theories of consumer behavior and decision making.

The final blue cluster includes 42 keywords and 'Purchasing,' 'electric cars,' 'environmental concern,' 'social norm,' and 'electric car.' This cluster's theme focuses on environmental concern, and social norms influence the purchase intention of EVs.

## 5. Conclusion and discussion

### 5.1. Conclusion

This study conducts a thorough and bibliometric analysis of the pertinent literature regarding the variables influencing the intention to purchase an electric vehicle. Thirty-six articles have been published between 2016 and 2023. The average annual number of publications has increased significantly at this critical juncture in 2020. This paper supports the idea that there has been an increase in academic writing on this topic, particularly in the past 3 years. Researchers in China published the largest proportion of articles, followed by those in India, Indonesia, Malaysia, and Saudi Arabia. Judging from the data analyzed so far, there is still a lack of research on factors influencing consumers' intention to purchase EVs in Malaysia, so this research field has research potential in Malaysia. All articles were written in English, making them easy to distribute worldwide.

The topic influencing electric vehicle purchase intention mainly comes from environmental science, engineering, social science, energy, and computer science. This subject also interests researchers in other academic disciplines, including business, management and accounting, decision sciences, economics, econometrics, finance, and mathematics. This bibliometric review indicates that the average number of authors per paper has increased along with an annual increase in publications.

In keyword co-occurrence analysis, the identified keywords and six clusters were analyzed. It was found that as time passed, the topics were studied with increasing care and accuracy. From general influencing factors to detailed influencing factors such as environmental concerns, social terms, sustainable development, and attitudes. It was also found that most studies used questionnaires or surveys to collect data. In terms of the theoretical framework of the research, it will be biased toward behavioral research, such as the theory of planned behavior, and decision making.

Research on the factors influencing consumers' intention to purchase EVs can provide practical insights to policymakers and industry stakeholders that promote sustainable transportation practices.

### 5.2. Implication

This study makes an important contribution to the current literature by extending the knowledge on the influences on consumers' intention to purchase electric vehicles. Analyzing the research direction, publication number, and keywords in the literature can predict future research directions. From the direction of influencing consumers' intention to purchase electric vehicles, research on topics such as electric vehicle technological innovation and charging station planning can be extended. As an emerging electric vehicle market, Malaysia has great potential for research on intention to purchase EVs.

### 5.3. Limitation

One of the limitations of this study was that only one database, Scopus, was used for the systematic search. The internal search excludes other literature databases, such as Web of Science, Science Direct, Wiley Online Library, etc. As the most competitive electric vehicle market in the world, articles from China definitely lead the way. However, this study did not include data from Chinese article databases.

An additional constraint pertains to the choice of search terms, which were separated into two groups for this investigation: terms associated with electric cars and those linked to purchasing. Additional search terms that could affect consumers' intention to buy EVs include drivers, obstacles, and antecedents.

#### 5.4. Suggestion for future work

When selecting databases for the literature review, in addition to the English databases like Web of Science, Science Direct, and Wiley Online Library, etc. mentioned earlier, researchers can refer to articles from the China National Knowledge Infrastructure (CNKI). Also, it would be beneficial to incorporate additional search terms related to drivers, obstacles, and antecedents of electric vehicle adoption could enhance the identification of influencing factors.

#### Author contributions

Zhu Xinyu: Contributed to research design, data collection, and research analysis.

Hendrik Lamsali: Verified and validated the results and helped with discussions and conclusions.

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#### Data availability statement

The data that support the findings of this study are available in the Scopus database.

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