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TOWARDS ACHIEVING SUSTAINABLE TRANSPORTATION IN UNIVERSITY

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ABSTRACT

The concept of sustainable transportation within university campuses is gaining prominence due to its potential impact on environmental, social, and economic aspects. Universities serve as valuable case studies for this concept due to their diverse populations and roles as centers of education and research. The transportation choices made within campuses directly affect CO₂ emissions, with private vehicles, student vehicles, and visitor transportation collectively contributing to carbon dioxide emissions through the combustion of fossil fuels. Limited resources, resistance to change, lack of awareness, inadequate infrastructure, cultural norms, coordination challenges, and behavioural inertia pose challenges to promoting sustainable transportation on campuses. The ultimate aim of this research is to focus more on sustainable transportation in the university. Furthermore, the objective of this research is to identify the factors that influence the awareness among students toward sustainable transportation. The search for relevant literature review using academic databases. The screening and selecting of journals based on relevancy to the key findings and themes. The article is critically evaluated based on the factors that influence the awareness toward sustainable transportation and the issues related to the factors that influence the awareness toward sustainable transportation. From the analysis, the findings indicate that four (4) factors influence the awareness toward sustainable transportation, which are Environmental Concern, Social Concern, Economic Concern, and Availability of Public Transportation.

Keywords: Awareness, University, Sustainable Transportation, Carbon Emission.

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INTRODUCTION

Transportation is an important factor in the concept of sustainability, which has major consequences for the economic, social, and physical surroundings. Universities often serve as prime case studies for sustainable transportation due to their diverse populations and role as centers of education and research (Hall, R. ,2018). They offer a controlled environment to test and implement eco-friendly transportation strategies, influencing student and staff behavior while showcasing best practices for wider adoption. The form of transport utilized on campus can have an impact on CO₂ emissions (Dr. Reshmi. R and Dr. Haneesh. P., 2021). As these vehicles traverse the campus, they collectively contribute to carbon dioxide (CO₂) emissions due to combustion of fossil fuels. Private vehicles, often used by faculty and staff, can significantly contribute to emissions as they navigate the campus. Similarly, student vehicles add to the emissions footprint, especially in cases where public transportation or sustainable alternatives are less prevalent. Moreover, emissions from visitor transportation further compound the environmental impact. Transportation is an important component of making towns more liveable because it affects all three components of sustainable development: the economy, the environment, and society. (Hilma, 2020).

Sustainable transport represents a sector related to environmental transportation and supply chain management that has received a lot of attention from academics and professionals in recent years. According to Rameshwar (2015), the current transport system has been widely recognized as unhealthy. The increasing usage of private automobiles has resulted in a variety of environmental, sociological, and economic issues. Noxious and dangerous chemical emissions lead to global warming, local pollution of the environment, for example, particles released in urban areas, and smog, which puts the environment and people's health at risk. Furthermore, car use damages the urban standard of life by being noisy and creating traffic accidents. In addition, the accessibility of economically significant sites is threatened.

Dogan I. (2018) stated that sustainability is defined as the appropriate use, preservation, and reuse of materials. Embracing sustainable transportation practices aligns with the principles of environmental stewardship, health promotion, and responsible resource management that universities often strive to uphold. By taking proactive steps towards sustainable transportation, universities can contribute to a greener future and inspire positive change in the broader community.

PROBLEM STATEMENT

In the realm of sustainable transportation, universities assume a vital role in educating students and the wider community about the significance of environmentally friendly transportation practices. This concept encompasses modes like public transit,

cycling, and walking, with the goal of minimizing the ecological and societal impact of transportation systems. Nevertheless, universities encounter a spectrum of challenges in effectively fulfilling this role. (Hall, R. ,2018)

Junainah Mahdee and others (2022) state that one such challenge is the constraint of limited resources, often constraining universities' ability to implement sustainable transportation initiatives. Establishing and upkeeping infrastructure for bicycle lanes, pedestrian walkways, and public transit networks demand substantial investment. Simultaneously, the entrenched preference for traditional transportation methods, like personal vehicles, due to their convenience and familiarity poses a resistance to change. Encouraging a transition towards sustainable options necessitates a transformative shift in attitudes and behaviors, a task not devoid of difficulties. (Dr. Reshmi. R and Dr. Haneesh. P., 2021).

A further hurdle stems from the lack of awareness prevalent among many individuals regarding the advantages of sustainable transportation and the adverse impacts linked to conventional modes. Effective communication of these concepts by universities becomes pivotal to fostering comprehension and garnering support. Inadequate infrastructure for sustainable transportation, such as insufficient bike racks, electric vehicle charging stations, and safe pedestrian pathways, may also hinder universities' efforts in this direction. (Ho, C., & Mulley, C. ,2018).

Imas Gandasari, and others (2020) say that cultural and societal norms can be an additional obstacle, influencing transportation preferences and thus potentially hindering the adoption of sustainable practices. Addressing these norms becomes imperative for universities to enact meaningful change. Moreover, initiatives related to sustainable transportation necessitate intricate coordination and collaboration among various university departments and external stakeholders, including local authorities and transportation agencies.

Finally, Ho, C., & Mulley, C. (2018), explain altering behavioral patterns to encourage students and the community to embrace sustainable transportation practices poses an ongoing challenge. Overcoming inertia and stimulating change demand consistent effort. In light of these multifaceted challenges, it becomes evident that universities' endeavors to advance sustainable transportation education and advocacy require a comprehensive approach and dedicated persistence.

OBJECTIVE

In this study, the main objective is to identify the factors that influence the awareness among students towards sustainable transportation in university.

LITERATURE REVIEW

This section describes the areas that are closely related to the study of factors that can influence awareness toward sustainable transportation.

Awareness of Sustainable Transportation

According to Nur Fatahiyah (2016)'s case study, raising awareness of sustainable transport is about educating people of all kinds about the benefits of sustainable transport and encouraging them to adopt sustainable transport practices. This includes promoting public transportation, providing infrastructure for cycling and walking, encouraging carpooling, and implementing policies to reduce the use of single-occupancy vehicles. In addition to promoting sustainable transportation to reduce environmental impact, raising awareness about sustainable transportation can also have various benefits. For example, sustainable transportation can help improve public health by reducing air pollution and promoting physical activity.

The article titled *Public Awareness Towards Sustainable Transportation in Shah Alam, Malaysia* (2018), explains that public awareness refers to the level of knowledge, understanding, and concern that the general public has about a particular issue or topic. In the context of sustainable transportation, public awareness refers to the level of knowledge and understanding that members of the public have about sustainable transportation practices, such as walking, cycling, and using public transportation. Public awareness among students about sustainable transportation can help identify gaps in knowledge and understanding among the public and provide insights into the factors that influence the public's transportation choices (Na'asah Nasrudin, 2018).

Factors That Influence the Awareness

The awareness level of sustainable transportation is influenced by various factors that shape individuals' understanding and perception of this concept. Here are some of the key factors that can influence awareness levels.

- Environmental Concern

To maintain transportation's sustainability, environmental concerns are deemed vital. By providing students with information about sustainable transportation, it is anticipated that their awareness of sustainable transportation will increase (Floriana, 2020). The transportation industry is the second greatest contributor to carbon dioxide (CO₂) emissions caused by the combustion of fossil fuels (Veera, 2021). Furthermore, sustainability is intimately linked to transportation in terms of promoting balance in the environment (Sundram et al, 2017). Transport has a substantial environmental impact since it consumes a lot of energy and contributes to climate change (Keat et al., 2016).

There are several unforeseen disadvantages such as regional air and noise pollution caused by a large number of vehicles gathered in a small area, extra fuel consumption, and extra emission due to vehicles touring around in search of parking space. (Mustafa, 2022). Veera (2022) says, without awareness, students may not take advantage of available resources and services aimed at promoting sustainable transportation. They may miss out on benefits like discounted public transit passes, bike-sharing programs, carpooling networks, or designated parking for sustainable vehicles.

- Social Concern

Sustainable transportation can provide significant benefits to communities such as security, emotional well-being, convenience, wellness, economic expansion, and social growth (Veera, 2022). Bukryman (2021) states that students, as key stakeholders in campus communities, have an important role to play in promoting sustainable transportation practices. The level of social concern among students about sustainable transportation can be influenced by various factors, including the availability of sustainable transportation options, the perceived benefits of using sustainable transportation, and the social norms and values of the campus community. Heavy reliance on private vehicles contributes to traffic congestion on and around campuses, affecting not only students but also faculty, staff, and residents. Increased congestion can lead to longer commuting times, frustration, and reduced productivity. (Adnan, 2021)

Bukryman (2021) states that sustainable transportation modes, such as walking, cycling, or using public transit, promote community integration. They allow students to interact with their surroundings, engage in local businesses, and foster a sense of belonging. A lack of awareness about these benefits can isolate students and limit their connection to the campus and surrounding community. Sustainable transportation options facilitate interaction and social connections among students, faculty, staff, and the community. Students who are unaware of the social benefits may miss opportunities to engage in carpooling, community events, or public transit conversations that foster relationships and a sense of shared responsibility. (Adnan, 2021)

Promoting the use of public transportation can decrease the number of personal vehicles and reduce emissions on university campuses (Mustafa, 2022). This can encourage students to adopt sustainable transportation practices. Various viewpoints and opinions among university students and faculty influenced how they chose to take any travel from their house or college to the campus regularly. Educational campaigns and outreach programs promoting sustainable transportation can effectively increase awareness among students about sustainable transportation modes. These programs can provide information about sustainable transportation's environmental and health benefits, as well as practical tips for incorporating sustainable transportation into daily routines (Husaini, 2017).

- Economic Concern

According to Adnan (2021), Sustainable transport strategies and initiatives are among the most important influences on urban sustainability as a major issue related to people, goods, and land use planning. It is cost-effective, and socially just, and promotes effective economic competitiveness. It also promotes both economic and social connectivity through efficient mobility, allowing for easy, safe, comfortable, and economical access.

Mustafa (2022) said that economically, traffic congestion increases economic expenses, wastes time, and causes delays in reaching public utilities. Students often have limited financial resources and may seek cost-effective transportation options to reduce their expenses. Sustainable transportation options, such as public transit passes, bike-sharing programs, or electric scooters, may require upfront costs or ongoing expenses. Students who are not aware of these options or do not understand their long-term benefits may perceive them as financially burdensome compared to other modes of transportation. This can discourage them from utilizing sustainable transportation alternatives. (Fernandes et al.,2019).

Transport gives great chances for both social and economic growth. By adopting the right policies, universities can change their campuses in terms of sustainable transportation and thus guide society in this regard. Student discounts on buses, minibuses, and metro fares encourage public transportation. In addition, keep communications with the organizations responsible for operating public transportation services to provide the best possible condition (Mustafa, 2022). UiTM Shah Alam has implemented a comprehensive shuttle service that connects the main campus to nearby student accommodations, transportation hubs, and popular destinations. This shuttle service aims to provide convenient transportation options and reduce the reliance on private vehicles. And also, the availability and affordability of sustainable infrastructure, such as bike lanes, secure bike parking facilities, or charging stations for electric vehicles, can influence students' economic considerations. If these infrastructure elements are lacking or insufficiently provided, it can limit the attractiveness and accessibility of sustainable transportation options. (Husaini, 2017).

- Availability of Public Transportation

Utilizing a public transportation system, such as a shuttle bus, is seen as a means of promoting social practices of fairness in sustainable mobility (Venter et al., 2017) and creating a culture of sustainable transportation on campus (Fernandes et al.,2019). In addition to walking and cycling, a university campus can establish a sustainable transportation culture by providing an efficient shuttle bus service (Fernandes et al., 2019). Students who live out of campus and who need to get to class every day will struggle if there isn't adequate transportation on campus.

The issue that students or staff face is poor access or interconnectivity where there are no complete facilities provided for students to use public transport, especially for students sitting outside who need to use public transport to save cost and time. The interrelationships of an urban network represent how existing infrastructure facilities merge to provide customers with seamless mobility options. (Prajapati J., 2018). A study conducted by Azani and colleagues (2017), found that the bus service provided by the university did not reach the quality aspect as expected and it was clear that it could not meet the needs of the students. They found several factors that contributed to this problem, including the attitude of bus drivers who are sometimes unprofessional, not ready when needed, and the lack of buses during peak hours.

METHODOLOGY

This research is used desk study analysis which applies a comprehensive literature review to identify the factors that influence the awareness among students towards sustainable transportation. The search for relevant literature review using academic databases. The screening and selecting of journals based on relevancy to the key findings and themes. The article is critically evaluated based on the factors that influence the awareness toward sustainable transportation and the issues that are related to the factors that influence the awareness toward sustainable transportation.

ANALYSIS AND FINDINGS

Table 1 An Overview of the findings of research into the factors that influence the awareness among students toward sustainable transportation.

No.	Author(s)	Factors that Influence the Awareness
1	Florianna (2020)	<ul style="list-style-type: none">● Environmental Concern
2	Veera (2021)	<ul style="list-style-type: none">● Environmental Concern● Social Concern
3	Sundram et al (2017)	<ul style="list-style-type: none">● Environmental Concern
4	Keat et al (2016)	<ul style="list-style-type: none">● Environmental Concern
5	Mustafa (2022)	<ul style="list-style-type: none">● Environmental Concern● Social Concern● Economic Concern
6	Bukryman (2021)	<ul style="list-style-type: none">● Social Concern
7	Adnan (2021)	<ul style="list-style-type: none">● Social Concern● Economic Concern
8	Husaini (2017)	<ul style="list-style-type: none">● Social Concern● Economic Concern
9	Fernandes et al (2019)	<ul style="list-style-type: none">● Economic Concern● Availability of Public Transportation
10	Venter et al (2017)	<ul style="list-style-type: none">● Availability of Public Transportation
11	Prajapati J. (2018)	<ul style="list-style-type: none">● Availability of Public Transportation
12	Azani and colleagues (2017)	<ul style="list-style-type: none">● Availability of Public Transportation

13	Ezanee Mohamed (2021)	<ul style="list-style-type: none"> ● Availability of Public Transportation
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Sources: The Researcher (2023)

Table 1 provides an overview of research findings regarding the factors influencing students' awareness of sustainable transportation. The table reveals that the majority of researchers primarily focus on environmental concerns as the key factor driving awareness among students. While social concern, economic concern, and the availability of public transportation are also recognized, they receive relatively less attention in comparison. The emphasis on environmental concerns highlights the significance of addressing sustainability and carbon emissions reduction in promoting awareness and adoption of sustainable transportation practices among students. However, it is essential to consider the broader range of factors, including social, economic, and transportation availability, to develop a comprehensive approach for fostering sustainable transportation awareness and behavior change among students.

The awareness level of sustainable transportation is influenced by environmental concerns, where students are aware of the impact of transportation on the environment and its role in climate change. Social factors also play a role, as sustainable transportation promotes community integration and a sense of belonging. Economic considerations are crucial, as students seek cost-effective transportation options. The availability of public transportation, like efficient shuttle bus services, is essential for promoting sustainable mobility on campus. Addressing these factors and increasing awareness can lead to more students adopting environmentally friendly and socially beneficial transportation practices.

CONCLUSION

From the analysis, most of the researchers are focus on environmental concern because if a student is unaware of the environmental concerns surrounding sustainable transportation on campus, they may not participate in initiatives, campaigns, or advocacy efforts related to sustainability. This lack of awareness can result in continued use of unsustainable transportation methods, leading to increased environmental impact and missed opportunities for cost savings and improved health. The student may also overlook available resources and educational opportunities. It is crucial to raise awareness among students about environmental concerns related to sustainable transportation on campus. Raising awareness through educational campaigns, events, and curriculum integration is essential to encourage environmentally conscious choices and foster a sustainable campus community.

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Sekian, terima kasih.

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Saya yang menjalankan amanah,

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