KULLIYYAH OF ISLAMIC REVEALED KNOWLEDGE AND HUMAN SCIENCES

SEMESTER 2, 2018/2019

PSCI 4997

ADVANCED RESEARCH METHODOLOGY

(SECTION 1)

Assessing bike sharing:
IIUM Gombak Students' Perceptions on UNiRIDE e-Bike

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1.0 BACKGROUND OF THE STUDY

This paper will mainly focus on the perceptions of IIUM Gombak students' toward bike sharing, UNiRIDE e-Bike. According to Rodrigue and Notteboom (2013), it is known that transportation is one of the essential parts of our daily lives. However, the merge of globalization lead to the various invention of transportations and one of them is bike sharing. According to Fishman, Washington and Haworth (2013), bike-sharing programs refer to the provision of bicycles to enable short-term rental from one docking station to another, these bicycles usually contain technologies that allow scheme operators to track movements, from one docking station to the next, and for those with integrated global positioning system (GPS), the bike's movement through the network. The benefits of bike sharing area it is flexible mobility in nature, emission reductions, physical activity benefits, reduced congestion and fuel use, individual financial savings, and support for multimodal transport connections. (Shaheen, Guzman, & Zhang, 2010)

Bike sharing is moderately new to Malaysian residents. Recently, one of the bike sharing programs in Malaysia that were introduced is UNiRIDE. UNiRIDE is a new vehicle sharing program that has been implemented in four public universities in Malaysia which promote green energy proficient vehicles. Since the university has allowed the operation of UNiRIDE to run, IIUM has been supportive of allowing bike sharing startups to operate in its campus in order to promote an environmentally friendly mode of commute and cost-effective transport for students that is pollution free and suitable to the lifestyle inside the campus. As these are better modes of transport in closed vicinity compared to the motor vehicles.

Therefore, the focus on conducting this research are to assess IIUM Gombak students' perceived factors and challenges towards the bike sharing program and UNiRIDE itself within IIUM Gombak campus.

2.0 STATEMENT OF PROBLEM

In today's world, there are many ride-sharing services which mainly use cars and shuttle buses. However, the issue arises when the desired destination or public transport station is either too far to walk or too near to drive, thus companies like BM Mobility LTD, oBike and OFO set out to fill the gap by ushering in the bike-sharing program. It aims to solve the issue of short-distance destination which connects the users to other public transport station or their destination.

Hence, "bike sharing" has become increasingly popular across the globe in recent years, which is designed not only to reduce negative externalities but also to satisfy the demand of the residents' travel needs. Bike sharing comes with an initiative to reduce environmental degradation caused by motorized vehicles. This noble intention seeks to increase bicycle usage, promote a healthy lifestyle among the public as well as making bike sharing a daily mobility option. In realizing sustainable environmental goals, places like university hold the ideal goal, to begin with. According to Fund (2012), the university possesses three key elements for bike sharing to operate; financial constraints, limited land as well as air quality concerns.

Concurrently, UNiRIDE e-Bike, an on-campus vehicle sharing program owned by BM Mobility LTD, has operated in four different universities in Malaysia and is aiming to attract a quarter of a million users from the pool. It focuses on contributing to a greener Malaysia by

providing hassle-free transportation as well as making it cost-effective for students to commute conveniently (Williams, 2018).

Assessing one of UNiRIDE's consumers, the International Islamic University Malaysia (IIUM) has allowed the operation of UNiRIDE e-bike to run since early 2019. A sequel effort after the failure of OBike, a bike sharing startup, IIUM has been supportive of allowing bike sharing startups to operate in its campus in order to promote an environmentally friendly and cost-effective transport for students to commute.

Based on our pilot experiment that was conducted to test the feasibility of our research project, among 30 people of IIUM Gombak students, we found that 80% of them which equivalent to 24 respondents are aware of the existence of UNiRIDE e-Bike. However, only 46.7% of the result have ridden the e-Bike before. This shows that IIUM Gombak students do aware of the bike-sharing program yet do not fully utilize its benefits the e-Bike around the campus.

Concerns circulating after OFO and OBike have ceased its operation in Malaysia which lead to a question of its efficiency, effectiveness, and its relevance in Malaysia's environment and culture. Albeit, the past initiative carried a noble intention to make Malaysia a better place to live, yet it failed to meet its goals as people do not utilize this bike sharing program which is later being abandoned.

On the university level, concerns pertaining to its safety, affordability, accessibility and its quantity are the areas worth exploring in order to affirm its environmental and personal convenience visions.

Therefore, the focus on conducting this research are to assess IIUM Gombak students' perceived factors and challenges towards the bike sharing program and UNiRIDE itself within IIUM Gombak campus.

3.0 RESEARCH QUESTIONS

1. What are the perceived factors that influence the IIUM students on the perception of UNiRIDE e-Bike?
2. What are the challenges faced by the IIUM students on the perception of UNiRIDE e-Bike?

4.0 RESEARCH OBJECTIVES

1. To identify the perceived factors that influence the IIUM students on the perception of UNiRIDE e-Bike.
2. To analyze the challenges that could be faced by IIUM students on the perception of UNiRIDE e-Bike.

5.0 RESEARCH SIGNIFICANCE

This research is vital to the IIUM students at large as it assesses their perception of the UNiRIDE e-Bike sharing program that is initiated by the university. The findings of this research could assist and contribute for any improvements that can be done to complement the university's mission and vision which aims to become a preeminent international centre of educational excellence. Plus, in achieving other external goals such as reducing the number of

motor cars around the campus area as well as encouraging the environmentally friendly way of commuting, this study could lead to a better understanding on the demand and interest among IIUM students on the usage of the bike sharing program. In implementing any initiatives, it is worth to note on the consumer's perceived value on the product to complement any efforts initiated. Further, this study could act as a reference for any future efforts related to bike sharing programs by identifying keen interest among the IIUM Gombak community.

6.0 LITERATURE REVIEW

There is an extensive amount of literature review discussing the importance of transportation, bike sharing revolution, and public perception of it. Based on the existing article, we have divided our literature review into three main concerns which are urban mobility, bike sharing, and public perception towards bike sharing.

6.1 Urban Mobility

As the population of global citizen grows, there are significant challenges face by individuals in adapting to urban development and mobility. In the case of urban mobility, it is best to define urban mobility first. According to Costa, Neto, and Bertolde (2016), it is the ability to move from one place to another. As stated by Kayal, Singh and Kumar (2014), it means to fill in the 'space' between two destinations and meet the demand that occurred by the displacement of people and goods. For this reason, urban mobility can be considered as a vital resource and an articulator in society's life since it directly related to the movement of people from one place to another.

However, as the rapid growth in urban areas occurs, it leads to a growing number of private vehicle and lacking proper planning of public transportation systems which both later directly have led to the inefficiency of mobility and entail environmental problems. As stated by Kayal et.al. (2014) the factors such as income, employment, gender and age do affect mobility in urban areas. From this, it can be understood that activities of travel to one place to another which costs money or cash are an integral part of urban mobility. Using transportation system provided by both public and private sector can ease the movement of individuals even though it requires fee or payment.

On the other side, Pojani and Stead (2015) claimed that cities have experienced rapid growth in terms of mobility, transportation-related to be exact. However, the development has its own drawbacks as the gas used in vehicle lead to pollution, the number of private vehicles on road has cause congestion and accident. In the article, the authors critically review past research paper through document review and analysis in which made their research article a qualitative research article. As it focuses is on the impact of urban transportation in developing cities and countries, thus the research article is useful for the policymaker to measure the effectiveness of their policy in the transportation sector.

According to Economic Cooperation and Development (OECD) (1996) as cited in Steg and Gifford, (2005) stated that the number of travellers who used private car increased by 90% in Western European countries between 1970 and 1990. In 1990, the number of travellers who used private vehicles in United State rose two times higher than in Western European countries. Somehow, it also forges the linkage between urban mobility and environmental degradation, climate change, energy depletion and lack of accessibility of the urban poor. All these cause and

effect then urge the researcher to construct a new initiative to cater to these issues which are called sustainable mobility. According to Costa et.al. (2016), to achieve sustainable mobility, it includes minimization need for travel for certain activities which can be replaced through technology. For instance, online purchases via the Internet rather than physically go out and buy things. This statement is supported by Kayal et.al. (2014), by stating that to achieve sustainable mobility, it also involves a reduction in the amount of travel and limitation number of trips per person.

According to the Euroforum (2007), as cited in Costa et.al. (2016), they believe that cities need to come together and support this initiative in order to fulfil a social function. This is because in order for the world to achieve sustainable mobility, it has to start from the individual level, for example, using public transportation that is non-motorized modes, and limiting the use of private cars rather than trying to undo the transformation of cities caused by automobile dominance (Pojani & Stead, 2015).

Similarly, as cited in Steg and Gifford (2005), Economic Cooperation and Development (1996) suggest that sustainable transportation can be made through behavioural and technology changes. Behavioural changes can be defined as the efforts put into reducing the dimension of vehicle use, for example by shifting modes of transport such as switching into the more convenient or comfortable mode of transport. This is the condition put by Gardner and Stern (1996) who recognized that behavioural changes usually involve additional effort or decreased comfort. The alternative modes of transport must be less contaminating or polluting to the environment, providing alternative destination points, producing minimal gas emissions, or an overall reduction when commuting. Such procedures may enhance sustainability in urban

mobility while preserving the environment. It can also bring contentment and urban satisfaction and improve the livelihood of the people while making destinations easily accessible to them.

According to Gardner and Stern (1996), in facets of technological solution, on the other hand, it is is more focused on developing new technology or mechanisms in the mode of transport, this may include the reduction of negative emission of vehicles. For instance, improving the efficiency of energy usage of car engines as well as renovating road surfaces to eliminate noise pollution. These solutions are not necessarily sufficient in reducing the number of private vehicles use, however, technological improvements can influence behavioural changes of individuals. For instance, the private vehicles users may change their vehicles to a more advanced-technology model of vehicle which energy-efficient and friendly to the environment.

6.2 Bike Sharing

The general principle of bike sharing posits users' usage as and when they required depending on their needs. The bicycles rented are stationed unattended at different locations. Users are able to rent and return them at any places depending on the company's regulations. Most of the bike sharing programs encapsulate its cost of maintenance, infantry and parking. In addition, bike sharing companies aim to focus on solving the last mile problem which indicates a trip that is too far to walk and too near to drive (Kaufman & Buttenwieser, 2018).

Historically, bike sharing evolution can be grasped into five key generations respectively; free bikes, coin-deposit systems, IT-based systems, demand-responsive multi-modal systems (IT-based bike sharing), and smart mobility (A.Shaheen, Zhang, Martin, & Guzman, 2011) (Roland Berger, 2018).

The first generation which started in the mid-1960s in the Netherlands has allowed users to commute freely with its single colour bicycle. However, most of the operations were ceased due to theft cases, vandalism concerns and other security issues. Consequently, in 1991, the second evolution can be witnessed with an improved coin-deposit docking system in Denmark. Users were only required to deposit a small amount upon riding. However, most of the bikes were often being taken for a longer period or in the worst case, being stolen.

The advent of technology has brought changes in the third generation by introducing more sophisticated mechanisms in ensuring greater sustainability and accountability. First initiated in France back in 1998, the advanced systems include users' credit or debit card details, new docking systems, better designs as well as its availability in websites and application for user's convenience. Further, the fourth generation improves in users' conveniences like providing GPS for location accessibility, introducing user's interface technology for check in and check out, dockless bicycle as well as introducing demand responsive system. According to Ronald Berger (2018), the fifth generation diversified its business models by introducing various formats including Electronic-Bike (E-Bike), company bike sharing, and cargo bike sharing. The latest generation also includes seamless payment method as well as further technological improvements including customer's data collection.

In Malaysia, the bicycle sharing program was first introduced in Penang back in 2016. The initial objective of the program is to allow tourists to roam around the island's tourist attraction. According to Khorasani (2012), with the current development of public transport in Malaysia, the program is relevant by assisting users to commute to and fro to their destination by placing stationing them near public transit networks. Additionally, the government has

announced several policies and programs to reduce the congestions which have included bike sharing as one of the effective and accommodating solutions. However, studies have shown that this bike sharing program differs in context. Rosnan and Abdullah (2018) suggested that most of Malaysians use the bicycles for leisure activities which are in contrast to the studies found by O'Brien, Cheshire, and Batty (2014) which highlighted North Americans mostly utilise the bike sharing program for work or school related.

As e-bike and e-scooter are relatively new in Malaysia, there has yet to be any studies on its origins, developments and perceptions. However, on the legal aspect, Malaysia has legislated clear measures regarding its speed, performance, safety, and compliance concerns (Bakker, 2018).

6.3 Public Perception of Bike Sharing Program

Initially, the bike sharing program is beneficial to either users or stakeholder. For the former, the bicycle sharing program brings benefits into certain spectrums such as environment, health and it is good as a daily mobility option. For the latter, Mateo, Kumar and Mejia (2017) identified interest of various stakeholders on bike sharing in Asia by conducting an online questionnaire survey with a total of 93 survey respondents participated in the online survey. Respondents were queried on their level of agreement to benefits of Public Bicycle sharing programs upon likert scaling (from 5=strongly agree to 1=strongly disagree). Mateo, Kumar and Mejia (2017) mentioned that the benefits can be seen in social, economic, environmental and personal fields. Schneider and Robert were using qualitative analysis that interviewed 14 community partners in Milwaukee and 12 community partners in the Twin Cities which were invited to provide their personal thoughts and opiniScneons (2013). Schneider and Robert (2013)

explicated the factors that influence personal perception towards bike sharing which are awareness and availability; basic safety and security; convenience and cost; enjoyment; and habit of the individuals.

However, there are indeed some obstacles to the users of the bike sharing system (Rosnan & Abdullah, 2018). The objective of Sousa, Sanches and Ferreira research was to evaluate the perception of a group of individuals with respect to barriers that may hinder the use of bicycles for commuting (2014). Data collection was carried out with 380 college students in three Brazilian cities. In order to assess the perception of barriers, a questionnaire, based on the dimensions of the Theory of Planned Behavior, was prepared. Respondents were asked about their perception of barriers (control beliefs). These statements were evaluated by respondents using a seven-point Likert scale (from strongly agree=7 to strongly disagree=1). Sousa, Sanches and Ferreira indicated that there are six barriers which shape users' perception; infrastructure, safety, distance, skill, slopes, and climate. The study identified that each community has different perceptions towards bike sharing. For example, the majority population in Malaysia deemed the concept of bike sharing is a feasible idea (Rosnan & Abdullah, 2018). The study done by Rosnan and Abdullah (2018), was derived from Davis' theoretical framework measuring on the perception which can be categorized into two categories; perceived usefulness and perceived ease of use. However, the qualitative outcome of the study can be questioned as both Rosnan and Abdullah did not specified the samples used for their study. According to Fishman (2011) as well as Sousa et al. (2014), in Malaysia, a bicycle is used for leisure time but not for commuting from place to place, thus, it is bizarre main transportation to use. Furthermore, as Sousa et al. (2014) examined, the lack of bicycle path caused most Malaysian reluctant to use the bike sharing

system. In addition, the weather in Malaysia cannot support the program to be successful since the users will reckon in using it (Fishman, 2011). In brief, either producers or consumers have a different perspective towards the bicycle sharing system in the light of the difference of angle how they look and experience it.

7.0 THEORETICAL FRAMEWORK

The term "bike sharing" in the context of this study aims to assess the perceived factor and challenges of the students in International Islamic University Malaysia (IIUM) students on the perception of UNiRIDE e-Bike. Several theories have suggested explaining the acceptance of new technologies by consumers and their intention to use them. These included the Technology Acceptance Model (TAM) proposed by Davis (1989) as illustrated in Figure 1. We are adopting Davis's model of Technology Adoption which carries two theoretical notions to examine users' perception on bike-sharing initiative. The two theoretical notions are perceived usefulness and perceived ease of use.

Davis's theory (1989) under "perceived usefulness" is defined as people's perception on how the subject matter, which is the UNiRIDE e-bike, can be seen as useful and beneficial to them. According to TAM, perceived usefulness can foster an attitude and behavioural intention. If people feel that the commercial bicycle sharing systems are useful and beneficial to them, they will develop a positive view of the system of bike sharing and be more willing to use it. Further, Ashley (2012) asserts that the bike sharing program has the ability to reduce parking space demand, greenhouse emission and traffic congestions to collectively maintain a greener campus.

Whereas, "perceived ease of use" is defined as the degree to which a person believes that using a particular system would be free of effort or hassle-free. UNiRIDE company rendered its services with the introduction of its mobile application for registration, payment and other usage purposes under a single platform. Further, mobile application is in line with Davis' theory on " perceived ease of use" as UNiRIDE variety of services are put under one single platform for hassle free transaction.

This theoretical framework is important as it helps to explain the variable used in this study systematically. The theory will further assist to examine the perception of UNiRIDE among IIUM students on both of perceived of usefulness and perceived ease of use.

Diagram:

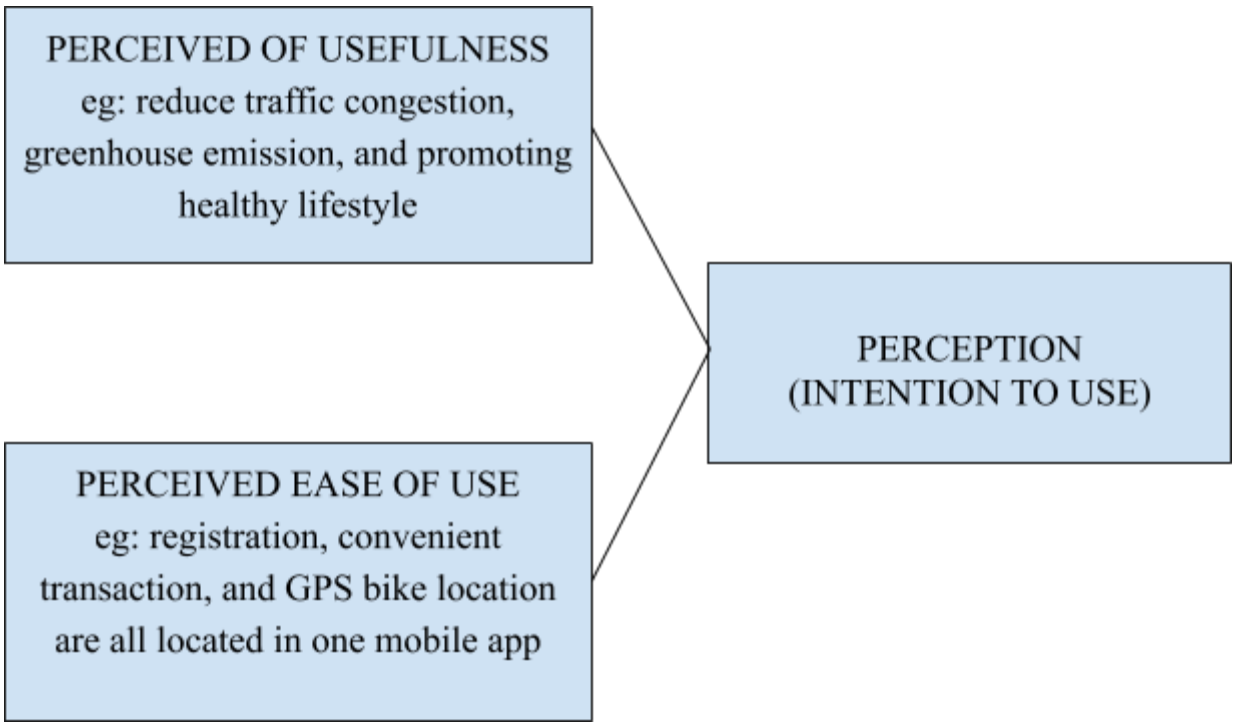

Figure 1: Davis' Technological Adoption Model (TAM) 1989

Hypothesis:

1. The e-Bike facilities offered by UNiRIDE create a good perception among IIUM students.
2. UNiRIDE usefulness is the factor that shaped a good perception among IIUM students.

8.0 DEFINITION AND OPERATIONALISATION

The research has identified two concepts which are perception and bike sharing which are;

8.1 Perception

Conceptually, the word "perception" in the Cambridge English Dictionary, is defined as a set of beliefs or opinions, often held by many people and based on how things seem.

8.2 Bike Sharing

According to the European Cyclist Federation (ECF, 2012) a Bike Sharing Scheme (BSS) is "a self-service, short-term, one-way capable bike rental offer in public spaces, for several target groups, with network characteristics".

9.0 RESEARCH METHODOLOGY

9.1 Research design

The research design of this research project is survey research which use quantitative type of research methodology in terms of data collection. In order to find the answer for the research questions and to test the hypothesis, self-constructed questionnaire was used. The self-constructed questionnaire was created in Google Forms and the link was distributed in

Whatsapp with an attached link. Further, the self-constructed questionnaire was divided into four different sections which are the demographic data, perceptions on usefulness, perception on ease of use, challenges on the usage and another three opened-ended questions to substantiate the finding later on. Lastly, for the data analysis, Statistical Package for Social Science (SPSS) version 23 was used to measure the data collected in the survey questionnaire.

9.2 Data Collection

The information was collected through primary and secondary sources. The primary source was obtained from a self-constructed survey questionnaire and the data later was collected by using Google form which was distributed online via WhatsApp with an attached link. The types of the questionnaire constructed were closed-ended questionnaire and opened-ended questionnaire. The researchers included opened-ended question so that the respondents can share their opinion and comment about the existence of UNiRIDE e-Bike.

The first section of the questionnaire was demographic data which consist of 4 closed-ended questions, the second section was pertaining to the perception on usefulness which included 6 items closed-ended questions, the third section was pertaining to perceptions of ease of use which consisted of 6 closed-ended questions. The fourth section was the challenges on the usage include 5 closed-ended questions and the last section was filled with 3 opened-ended questions. The total of questioned items excluding demographic data were 17 closed-ended questions and 3 opened-ended questions. Likert scaling was chosen to measure the response from the respondents which are from 1 to 5 (strongly agree, agree, neutral, disagree, strongly disagree). The questionnaires were used to answer all the two research questions. Whereas, for the secondary source, it was collated from available data such as journals, and articles.

9.3 Sampling of Study

As stated in the official website of IIUM, IIUM Gombak has more than 18.800 enrolled students. A large number of the total population is not suitable to be the sample of this study due to financial constraint and limited time of conducting the research. Thus, the researchers chose a sample size of 70 students of IIUM Gombak campus only.

The sampling technique used was non-probability convenience sampling. Convenience sampling is one of the types of nonprobability or nonrandom sampling which aim for members of the target population that meet certain practical criteria. Its criteria are easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study (Ikker, Sulaiman & Rukkayya, 2015). Plus, according to Rubin and Babbie (2017), it is the practical research instrument because it is a low-cost, quick and an efficient way to obtain information from a large sample which in this context it is the IIUM students. This method and concept are easy and the subjects are readily available.

9.4 Data Analysis

As the quantitative technique has been adopted in this study, the survey was analyzed using the Statistical Package for Social Science (SPSS) version 23. The data that has been analyzed were classified according to the demographic data, perception on usefulness, perception on ease of use, challenges and open-ended questions. Then, the data procured from the SPSS was analyzed in statistical finding which was later be presented in the form of a frequency, percentage, mean, standard deviation, mode and median.

Other than that, for the secondary source, thematic analysis was used to analyse the articles and journals retrieved for the literature review. This was to strengthen the statement of the problem and the research questions built in this research project. More often than not, thematic analysis suits best on questions related to people's perceptions and views on the subject matter which in this study it is the perceived factors that influence the IIUM students and challenges faced by them on the perception of UNiRIDE e-Bike. The process involved weaving together the analytic narrative and data extracts. It also includes contextualising the analysis in relation to existing literature that was chosen for the literature review which in this research project are urban mobility, bike-sharing program and public perception of the bike-sharing program.

10.0 FINDING AND DISCUSSION

Based on the data that has been collected using a survey questionnaire, the data and figures that are processed using SPSS and discussed as in terms of its goodness of measurement, data distribution, demographic data, and descriptive analysis. It is necessary in order to answer the research questions and to test the hypothesis. The discussion are as shown below:

10.1 Goodness of Measurement : Reliability

According to Babbie (2011), reliability is understood as the "the quality of measurement methods that suggest the same data would have been collected each time in repeated observations of the same phenomenon" (p. 157). Hence, reliability test is being applied to ensure the consistency of the instrument used.

Further, when running the reliability test, Sekaran (2003) notes that reliability score of 0.7 or above can be deemed as a good score. While a score of 0.5 is considered as acceptable to measure the instruments. This paper has opted on the usage of the Cronbach Alpha term to measure the reliability of the instruments.

The reliability test for the first construct on the perception on UNiRIDE usefulness is as follows:

Reliability Statistics on The Perception of UNiRIDE Usefulness

Cronbach's Alpha	N of Items
.775	6

Table 1

The first construct on the UNiRIDE usefulness, as shown in table 1, is measured by using 6 items and the Cronbach's Alpha score reads 0.775 which is within the acceptable range and no further items needed to be excluded.

Reliability Statistics on The Perception of UNiRIDE Ease of Use

Cronbach's Alpha	N of Items
.773	6

Table 2

The second construct on UNiRIDE's ease of of use, as shown in table 2, is measured by using 6 items and the Cronbach's Alpha score reads 0.773. This condition make the analysis of the data sufficient using all six items without dropping any of them.

Reliability Statistics on The Challenges on The Usage of UNiRIDE

Cronbach's Alpha	N of Items
.791	5

Table 3

The third construct which measures on UNiRIDE usage challenges, as shown in table 3, is measured by using 5 items and the Cronbach's Alpha score reads 0.791. The general Cronbach's alpha is moderate, thus it is not needed to delete any item since the total reliability score is within its satisfactory range.

10.2 Data Distribution : Normality Test

Normality distribution test on The Perception of UNiRIDE Usefulness

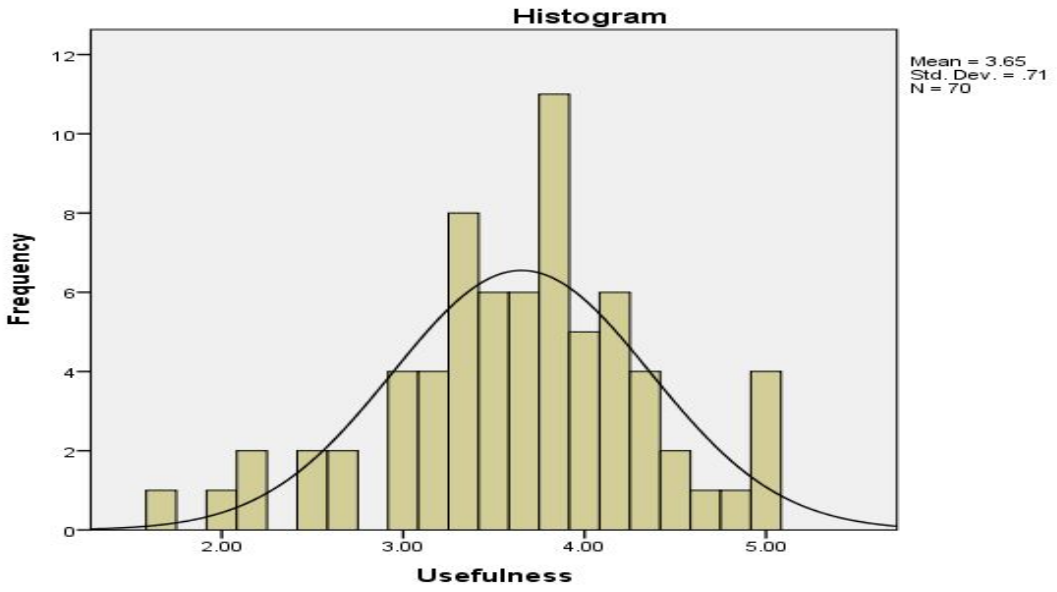

Figure 1

Figure 1 shows the normality distribution test on the construct regarding the factors on perceived usefulness. The mean is 3.6524, the median is 3.667, and standard deviation is

0.71037. Further, the graph is negatively skewed and record -0.403. The standard deviation records 0.71037 which shows a minimal dispersion of data from the mean result. In interpreting the way of distribution shape, it can be inferred that the normal distribution on the construct regarding the factors on perceived usefulness shows that IIUM Gombak students incline to agree that UNiRIDE e-Bike is useful for them and the environment.

Normality distribution on the Perception Ease of Use

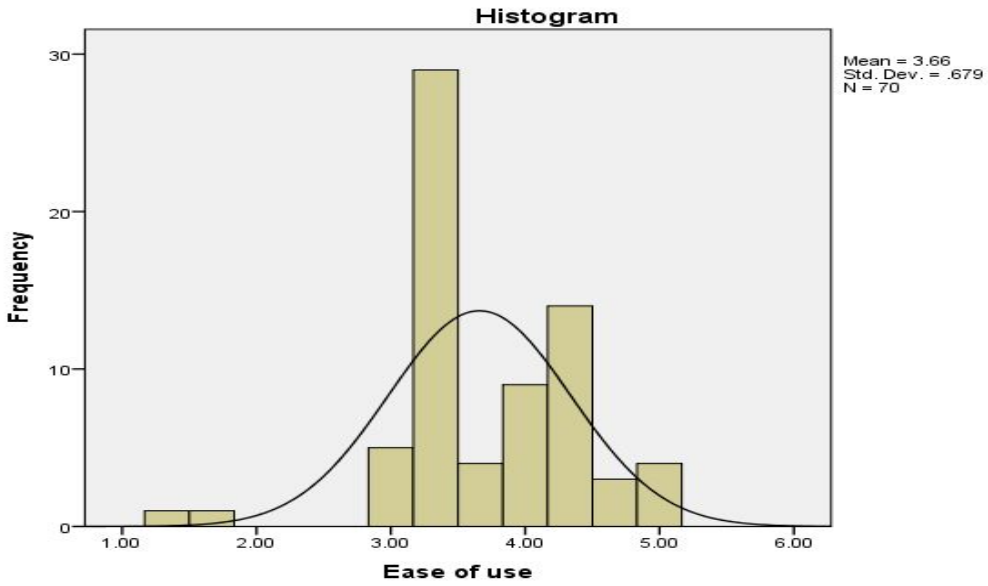

Figure 2

Figure 2 shows the normality distribution test on the construct regarding the factors on perceived of ease of use. The mean is 3.6595, the median is 3.5000, while the standard deviation recorded is 0.67949. Further, the graph is negatively skewed and record -0.474. The standard deviation records 0.67949 which portray that there is slight dispersion of data from the mean of this construct. In interpreting the way of distribution shape, it can be inferred that the normal distribution on the construct regarding the factors on perceived ease of use shows that

IIUM Gombak students incline to agree that UNiRIDE e-Bike is convenient and easy for them to use.

Normality Distribution Test on The Challenges on The Usage of UNiRIDE

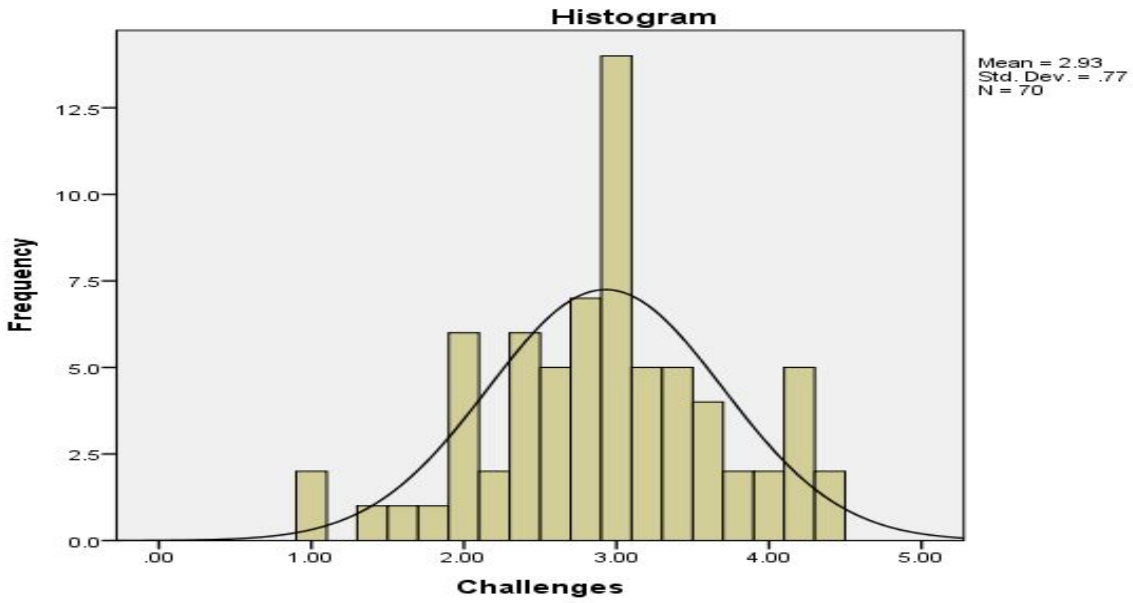

Figure 3

Figure 3 shows the normality distribution test on the construct regarding the challenges on the usage of UNiRIDE e-Bike. The mean is 2.9286, the median is 3.00, and the standard deviation is 0.77050. Further, the graph is negatively skewed and record -0.198. The standard deviation records 0.77050 which shows minimal dispersion of data from the mean result. In interpreting the way of distribution shape, it can be inferred that the normal distribution on the construct shows that IIUM Gombak students opt for neutral scale when asked about the challenges on the usage of UNiRIDE e-Bike.

10.3 Demographic Analysis

		Frequency	Percentage (%)
Gender	Female	42	60
	Male	28	40
Kulliyah	KIRKHS	49	70.0
	KOE	6	8.6
	KOED	1	1.4
	KAED	2	2.9
	KENMS	8	11.4
	KICT	1	1.4
	AIKOL	3	4.3
Degree	Undergraduate	67	95.7
	Postgraduate	3	4.3
Have you tried UNiRIDE?	Yes	30	42.9
	No	40	57.1

Table 4

The questionnaire was distributed among 70 IIUM students, as shows the aforementioned table, 42 (60%) of respondents are female and approximately 28 (40%) of respondents are male. Majority of respondents come from Kulliyah of Islamic Revealed Knowledge and Human Science which is approximately 70% of them that is equivalent to 49 students. Followed by 8 (11.4%) of respondents from Kulliyah of Economic, 6 (8.6%) of respondents from Kulliyah of Engineering, meanwhile 3 (4.3%) of respondents from Kulliyah of Law, 2 (2.9%) of respondents from Kulliyah of Architecture and only 1.4% of respondents from both Kulliyah of Education

and Kulliyah of Information and Communication Technology. In term of degree, the table illustrates that 67 (95.7%) of respondents are undergraduate students and only 3 (4.3%) of respondents are postgraduate students. However, 30 (42.9%) of the result has shown that IIUM students have tried UNiRIDE e-Bike while 40 (57.1%) of respondents have not tried UNiRIDE before.

10.4 Descriptive statistical analysis

The UNiRIDE e-Bike sharing program which started in early 2019 aims to preserve the environment by introducing green technology for students to commute using a hassle-free transportation. Based on the study collected from 70 respondents of IIUM community, 30 respondents have tried riding the e-Bike while the remaining 40 have yet to experience utilizing the initiative. Further, the purpose of this study is to assess the perception among IIUM community on UNiRIDE e-Bike sharing program based on two areas; perceived usefulness and ease of use (as shown in 10.4.1 and 10.4.2). Consequently, the study aims to assess the challenges and barriers faced by IIUM students on the usage of UNiRIDE e-Bike (as depicted in 10.4.3).

10.4.1 The perceived factors of IIUM students' perception on UNiRIDE e-Bike usefulness

Items	Mode	Disagree		Neutral		Agree	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1. UNiRIDE e-Bike encourages healthy lifestyle	3.00	21	30	25	35.7	24	34.3
2. UNiRIDE e-Bike is environmentally friendly	4.00	6	8.6	8	11.4	56	80.0
3. UNiRIDE can lessen greenhouse emission	4.00	9	12.8	9	12.9	52	74.3
4. UNiRIDE can reduce traffic congestion	3.00	20	28.6	21	30.0	29	41.4
5. UNiRIDE e-Bike save user's energy.	4.00	5	7.2	10	14.3	55	78.5
6. UNiRIDE e-Bike can reduce parking space demand	4.00	10	14.3	19	27.1	41	58.6

Table 5

Table 5 shows the construct for perception on the factors of UNiRIDE e-Bike among IIUM students on usefulness. It contains six items. The first item is regarding on the encourages healthy lifestyle. For this item, based on Table 5, The mode recorded is 3.00 with 25 (35.7%) respondents which can be interpreted that most of the them neutrally viewed that UNiRIDE e-Bike encourage healthy lifestyle. The second item is asking whether UNiRIDE e-Bike promote an environmentally friendly and the result showed the mode is 4.00 with 35 (50%) respondents. Based on mode illustrated, most of the respondents agreed that UNiRIDE e-Bike is

environmentally friendly. The third item is regarding UNiRIDE can lessen greenhouse emission and the mode stated is 4.00 with 35 (50%) of respondents that agreed that UNiRIDE can lessen greenhouse emission. However, on the fourth item, the question is asked about either UNiRIDE can reduce traffic congestion. The mode recorded is 3.00 with 21 (30%) of respondents which can be interpreted that most of them neutrally view that UNiRIDE can reduce traffic congestion. Meanwhile, the fifth item asked whether UNiRIDE e-Bike saves user's energy and approximately 29 (41.4%) of respondents agreed that UNiRIDE e-Bike saves user's energy. Last item is looking either UNiRIDE e-Bike can reduce parking space demand or not and the result shows that most of them agreed on that with 25 (35.7%). Overall, based on this construct, majority of the respondents agreed that the UNiRIDE's usefulness shaped a good perception of IIUM students. Therefore, it can be concluded that the second hypothesis is accepted; UNiRIDE usefulness is the factor of a good perception on UNiRIDE e-Bike among IIUM students.

10.4.2 The perceived factors of IIUM students' perception on UNiRIDE e-Bike ease of use

Items	Mode	Disagree		Neutral		Agree	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1. UNiRIDE e-Bike eases the mobility of the IIUM students	4.00	2	2.8	13	18.6	55	78.6
2. UNiRIDE e-Bike suits the mountainous road in IIUM	3.00	15	21.5	22	31.4	33	47.1
3. UNiRIDE e-Bike mobile application is user-friendly	3.00	9	12.9	31	44.3	30	42.8

4. UNiRIDE e-Bike is easy to ride within IIUM Gombak campus	4.00	6	8.6	20	28.6	44	62.9
5. UNiRIDE e-Bike is safe for IIUM students to ride	4.00	14	20.0	20	28.6	36	51.4
6. UNiRIDE e-Bike save students' time when commuting.	4.00	1	1.4	15	21.4	54	77.2

Table 6

Table 6 above illustrates six items included in the questionnaire to measure the construct on the factors of UNiRIDE e-Bike among IIUM students on ease of use. The first item regarding UNiRIDE e-Bike eases the mobility of the IIUM students showed that most of the respondents agreed on that with 30 respondents (42.9%). For second item, it was asked whether UNiRIDE e-Bike suits the mountainous road in IIUM. Most of the respondents neutrally viewed that UNiRIDE e-Bike suits the mountainous road. Which is approximately 31.4 that equivalent to 22 students. The third item regarding UNiRIDE e-Bike mobile application is user-friendly showed most of them neutrally viewed that UNiRIDE e-Bike mobile application is user-friendly with 31 respondents (44.3%). However, the fourth is about UNiRIDE e-Bike is easy to ride within IIUM Gombak campus showed that 30 respondents (42.9%) of the respondents agreed. Meanwhile, the question regarding UNiRIDE e-Bike is safe for IIUM students to ride is the fifth item showed that most of the respondents agreed with 24 respondents which approximately 34.3% . The last item for the construct on the factors of UNiRIDE e-Bike among IIUM students on ease of use is whether UNiRIDE e-Bike save students' time when commuting illustrated that 37 (52.9%) of the respondents have agreed perceptions on this item. All in all, majority of the respondents

agreed that UNiRIDE's ease of use creates a good perception of IIUM community. Thus, it can be inferred that the first hypothesis is accepted; e-Bike facilities offered by UNiRIDE do give a good perception among IIUM students on UNiRIDE e-Bike.

10.4.3 The challenges faced by the IIUM students on the usage of UNiRIDE e-Bike

Items	Mode	Disagree		Neutral		Agree	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1. The fees imposed by UNiRIDE e-Bike is affordable	3.00	22	31.4	18	40.0	20	28.5
2. UNiRIDE e-Bike provides convenient payment transaction	3.00	11	15.7	30	42.9	29	41.4
3. UNiRIDE e-Bike is available most of the time (pinpoint)	3.00	24	34.5	28	40.0	18	25.7
4. UNiRIDE e-Bike always maintain its condition (battery, tyres, brake)	3.00	16	22.8	35	50.0	19	27.2
5. The quantity of UNiRIDE e-Bike in IIUM Gombak campus is enough.	3.00	31	44.3	20	28.6	19	27.2

Table 7

Table 7 shows the item for the construct on the challenges faced by the IIUM students on the usage of UNiRIDE e-bike. The first item is asked about whether the fees imposed by

UNiRIDE e-Bike is affordable, followed by the second item evaluating whether UNiRIDE e-Bike provides convenient payment transaction, UNiRIDE e-Bike is available most of the time (pinpoint) is on the third item, UNiRIDE e-Bike always maintain its condition (battery, tyres, brake), and the quantity of UNiRIDE e-Bike in IIUM Gombak campus is enough is the last item. The result of all five items shows the mode 3.00 which indicates most of them chose neutrality on the challenges. But, not all items result in same frequency and percentage. The first and third items asked whether the fees imposed by UNiRIDE e-Bike is affordable, and UNiRIDE e-Bike is available most of the time (pinpoint) the table tells us that they neutrally viewed on that and result in the same frequency and percentage with 28 (40%) respondents. The second item is about asked whether UNiRIDE e-Bike provides convenient payment transaction or not and the result is 30 (42.9%) respondents give us a message most of them neutrally on UNiRIDE e-Bike provides convenient payment transaction. Next, the question whether UNiRIDE e-Bike always maintain its condition (battery, tyres, brake) recorded 35 (50%) respondents. Last item is looking either The quantity of UNiRIDE e-Bike in IIUM Gombak campus is enough or not and the result shows that 28 (28.6%) of the respondents neutrally viewed that the quantity is enough. Generally, the result on challenges can be observed that the main challenge that faced by the IIUM students on the usage of UNiRIDE e-Bike is the maintaining of its condition. Followed by, convenient payment transaction and affordability as second and third challenges that faced by IIUM student on the usage of UNiRIDE e-Bike.

10.5 In-depth analysis (Open-ended Questions)

The Performance of Uniride e-Bike in IIUM Gombak

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	POSITIVE	48	68.6	68.6	68.6
	NEUTRAL	12	17.1	17.1	85.7
	NEGATIVE	9	12.9	12.9	98.6
	99.00	1	1.4	1.4	100.0
	Total	70	100.0	100.0	

Table 9

Based on the responses collated on UNiRIDE e-Bike performance, 48 (68.8%) respondents gave positive feedback on its performance and expressed their satisfaction on its benefits and existence. Additionally, UNiRIDE e-Bike provides a convenient process in terms of registration, payment transaction and ease the students' mobility. In contrast, 9 (12.9%) respondents asserted negatively on UNiRIDE e-Bike's presence as majority of the concerns circulated around its slow maintenance, insufficient quantity, and its physical features which are deprived of long lasting batteries and 'offline' e-Bikes. The remaining 17.1% demonstrated neutral feedback on UNiRIDE e-Bike's presence as the respondents yet to ride the e-Bike and dismissed on the benefits that it brings to them. All in all, majority of the data collated indicates positive response from the IIUM community on its benefits and conveniences as aforementioned.

The Other Challenges faced by IIUM Students on the Usage of UNiRIDE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	AVAILABILITY	14	20.0	20.0	20.0
	PRICE	12	17.1	17.1	37.1
	USER GUIDE	13	18.6	18.6	55.7
	PHYSCFTRS	21	30.0	30.0	85.7
	NO CHALLENGES	7	10.0	10.0	95.7
	99.00	3	4.3	4.3	100.0
	Total	70	100.00	100.00	

Table 10

Based on the responses garnered, the researchers have categorized thematically on the challenges posed by the UNiRIDE; availability, rental fee, user manual guide, physical features, and absence of any challenges. The most answered theme which is the physical features aspects records 21 (30%) of the respondents agreeing to the inadequacy of the e-Bike's battery performance. The batteries, as a main source of its operation, according to the respondents are not fully charged and could not be used for a longer period and users are not well-informed on manuals on how to charge them. Further, users perceived that the provision of signal light on UNiRIDE e-Bike is a necessity to dictate its movement and to ensure user's safety as it is often being rode alongside other motorized vehicles on the road.

Consequently, 14 (20%) of the respondents complained that the quantity of UNiRIDE is insufficient for the IIUM community. As aforementioned, most of the feedback positively indicates UNiRIDE's benefits to the community, however, the supply does not coincide with the

demand taking into account IIUM large community and other factors such as low battery and other faulty concerns. 13 (18%) of the respondents viewed that the UNiRIDE e-Bike company does not provide enough information on its manual guide, awareness and promotion. Often, users refer to their friends for detailed information on the mechanisms to find and operate the e-Bike.

All in all, the concerns circulating around UNiRIDE's physical features and maintenance, its inadequate quantity and information gap are the main areas of improvement as those themes posed challenges and bore negative perceptions on the perceived ease of use among its users.

Suggestion to Improve on The UNiRIDE e-Bike itself

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	AVAILABILITY	25	35.7	35.7	35.7
	PRICE	13	18.6	18.6	54.3
	USER GUIDE	4	5.7	5.7	60.0
	PHYSCFTRS	19	27.1	27.1	87.1
	NO CHALLENGES	5	7.1	7.1	94.3
	99.00	4	5.7	5.7	100.0
	Total	100.0	100.0	100.0	

Table 11

Based on the responses collated, the researchers have thematically categorized the areas of improvement into 5 themes; availability, rental fee, user manual guide, physical features, and absence of any challenges. The most answered theme which is the availability aspect records 25 (35%) respondents suggesting to improve the availability of the e-Bike for better accessibility. Further, 19 (27%) of the respondents opined that the physical features such as the duration life of

the battery and the provision of signal light must be improved for better safety. 13 (18%) of the respondents note that the rental fee imposed must be bearable and affordable to student's capacity.

All in all, the areas of improvements shape the perception on the ease of use in terms of greater accessibility which is equipped with improved physical features to ensure user's safety with a endurable fee imposed on its services.

10.6 Overall Findings

		Usefulness	**Ease of use**
N	Valid	70	70
	Missing	0	0
Median		3.6667	3.5000
Std. Deviation		.71037	.67949

Table 12

This research paper aims to comprehend and answer two research questions proposed to identify the perceived factors that influence the IIUM students on the perception of UNiRIDE e-Bike as well as to analyze the challenges that could be faced by IIUM students on the perception of UNiRIDE e-Bike.

The data collated from the aforementioned questions on perceived ease of use and perceived usefulness shape and influence the perceptions among IIUM community. In terms of perceived of usefulness, UNiRIDE e-Bike advocates for the environmentally friendly aspect mitigating on the greenhouse emission. Additionally, the e-Bike saves user's energy and suits the

mountainous roads in IIUM. The e-Bike assists in dealing with daily issues like limited parking lots and traffic congestions.

On the ease of use aspect, UNiRIDE ensures better mobility and safety for its users. The mobile application eases user's registration process and monetary transactions without requiring any special license to operate the vehicle. Overall, the UNiRIDE ease the mobility of the students and provide the solution to the last mile problem.

As depicted and elaborated in the histogram findings, IIUM students generally agreed that the UNiRIDE e-Bike is useful for them and for the environment. IIUM students too were of the view that UNiRIDE e-Bike is convenient and easy for them to use. On the UNiRIDE challenges, IIUM students generally were neutral on UNiRIDE e-Bike usage challenges.

Further, the open ended data on the challenges faced by the users indicate their views on UNiRIDE's inadequate quantity to serve the large community of IIUM students. The physical features which are lacking in terms of battery life duration and safety worry those users on its usage. And the information gap on its promotion, awareness as well as its user manual guide posed challenges to them on its usage.

The overall findings are consistent with several literatures as aforementioned in the literature review. Steg and Gifford (2015) viewed that a sustainable transportation is imperative and it can be enhanced through technological changes in order to preserve the environment. The responses garnered from this research asserts that respondents are confident that the UNiRIDE initiative is one of the main tools to preserve the environment. The study also notes that the UNiRIDE is able to solve the last mile problem and save user's time which is consistent with the sustainable mobility as mentioned by Kayal et.al (2014) on the requirement for sustainable

mobility requires reduction in the amount of time travel. Further, the findings on the challenges generally faced by UNiRIDE on its infrastructure, safety, security and cost are consistent with Sousa, Sanches and Ferrerira (2014) and Schneider and Robert (2013) findings which note that the aforementioned factors influenced personal perceptions and could act as barriers to users usage.

11.0 LIMITATION OF STUDY

Among the limitations of this study is the ability to generalize the findings. The sample size of this study is considered small to be compared with the large ratio of IIUM students. Moreover the technique adopted is convenience sampling method which does not illustrate the whole perception of IIUM community towards the UNiRIDE. Further, as the UNiRIDE initiative is relatively new to IIUM community, students might refused to participate in the findings as they lacked the knowledge on the matter and might not used it before. The study also lacked literature review discussing on the e-Bike ride sharing program as most of the studies are focused on the traditional bike sharing.

12.0 CONCLUSION

This research paper studies on the perceived factors and challenges on the perceptions of IIUM students on the UNiRIDE e-Bike. The perception is measured using two variables adopted from Davis' Technological Adoption Model (TAM) 1989 Theory; perceived of usefulness and perceived ease of use. The research studied on the sample of 70 IIUM students using quantitative survey. Overall, the study notes that majority of the students agreed that the factors on perceived of usefulness and ease of use create a good perception on the bike sharing

initiatives. Further, the findings of this research could assist and contribute for any improvements that can be done to complement the university's mission and vision which aims to become a preeminent international centre of educational excellence. Lastly, this study could act as a reference for any future efforts related to bike sharing programs by identifying keen interest among the IIUM Gombak community.

13.0 REFERENCES

Costa P., Neto G., & Bertolde A., (2016) Urban Mobility Indexes : A Brief Review of the Literature, *Transportation Research Procedia 25C* 3649-3659

Centre for Advanced Spatial Analysis, University College London, Gower Street, London WC1E 6BT, United Kingdom. Mining bicycle sharing data for generating insights into sustainable transport system. *Journal of Transport Geography* 34 (2014) 262–273

Fishman, E. (2011). Evaluating the benefits of public bicycle schemes needs to be undertaken carefully. *British Medical Journal*, 343(d4521).

Guo, Y., Zhou, J., Wu, Y., & Li, Z. (2017). Identifying the factors affecting bike-sharing usage and degree of satisfaction in Ningbo, China. PloS one.

Geurs, K.T., Van Wee, G.P., (2000). Environmentally Sustainable Transport: Implementation and

Impacts for the Netherlands for 2030. RIVM, Bilthoven, The Netherlands.

Hannig, J. (2015). Perceptions of Bike Sharing in Underserved Communities Within Milwaukee and the Twin Cities, (May), 1.

Ilker Etikan, Sulaiman Abubakar Musa, Rukayya Sunusi Alkassim, Comparison of Convenience Sampling and Purposive Sampling, *American Journal of Theoretical and Applied Statistics*. Vol. 5, No. 1, 2016, pp. 1-4. doi: 10.11648/j.ajtas.20160501.11

Kayal P., Singh R., & Kumar M. (2014) Defining Sustainable Urban Mobility, The Energy and Resources Institute, Norwegian Ministry of Foreign Affairs (MFA)

Khorasani, G., Investigation and Implementation of Bike Sharing System in Kuala Lumpur, *International Conference on Transport, Environment and Civil Engineering*, pp.

153-157,

2012.

Mateo-Babiano, I., Kumar, S., & Mejia, A. (2017). Bicycle sharing in Asia: A stakeholder perception and possible futures. *Transportation Research Procedia*, 25, 4966–4978. https://doi.org/10.1016/j.trpro.2017.05.375

Mátrai, T., & Tóth, J., Comparative Assessment of Public Bike Sharing Systems,*Transportation Research Procedia*, 14, pp. 2344–2351, 2016.

Mekuria, M. C., Furth, P. G., & Nixon, H., [39] Loss-Stress Bicycling and Network Connectivity,

Mineta Transportation Institute Report 11-19, 68, 2012.

OECD (1996) Towards Sustainable Transportation. OECD Publications, Paris.

Pojani D., & Stead D. (2015), Sustainable Urban Transport in the Developing World: Beyond Megacities, *Sustainability*, 7, 7784-7805; doi:10.3390/su7067784

Poortinga, W., Steg, L., Vlek, C., Wiersma, G., (2003) Household preferences for energy-saving measures. A conjoint analysis. Journal of Economic Psychology 24 (1), 49–64.

Parkes SD, Marsden G, Shaheen SA, Cohen AP. Understanding the diffusion of public bikesharing systems: evidence from Europe and North America. *Journal of Transport Geography.* 2013; 31: 94–103.

Reser, J., (1980). Automobile addiction: real or imagined. Man– Environment Systems

Ricci, M., Bike sharing: A review of evidence on impacts and processes of implementation and operation, *Research in Transportation Business and Management*, 15, pp. 28–38, 2015.

Roland Berger (2018) Bike Sharing 5.0: Market Insights and Outlook, *Press Research Roland*

Berger, Berlin.

Rosnan, H., & Abdullah, N. C. (2018). Public Perceptions and Behaviours towards Bicycle Sharing Offered by SMEs as a Mode of Transportation and the Way Forward. *Environment-Behaviour Proceedings Journal*, 3(8), 180. Retrieved from https://doi.org/10.21834/e-bpj.v3i8.1411

Shaheen SA. Public bikesharing in North America: early operator and user understanding. *University of California—Berkeley*; 2012. MTI Report 11–19.

Siti Norida Wahab, Rohana Sham , Amir 'Aatieff Amir Hussin, Shakerin Ismail, Salini Devi Rajendran. Urban Transportation: A Case Study on Bike- Sharing Usage in Klang Valley. 2018. Vol. 7, No. 5. 475.

Sun, Y., Mobasheri, A., Hu, X., & Wang, W. (2017). Investigating Impacts of Environmental Factors on the Cycling Behavior of Bicycle-Sharing Users, 1–12. https://doi.org/10.3390/su9061060

Sousa, A. A., Sanches, S. P., & Ferreira, M. A. (2014). Perception of barriers for the use of Bicycles. *Procedia-Social and Behavioral Sciences,* 160, 304-313.

Schneider, Robert J. 2013. "Theory of Routine Mode Choice Decisions: An Operational Framework to Increase Sustainable Transportation." *Transport Policy Volume 25*, January 2013, Pages 128–137. (as cited in Hannig, J., 2015)

Shaheen S, Zhang H, Martin E, Guzman S.China's Hangzhou public bicycle: understanding early adoption and behavioral response to bikesharing. *Transportation Research Record:*

Journal of the Transportation Research Board. 2011; (2247): 33–41.

V&W (1991). Tweede Structuurschema Verkeer en Vervoer [Second Traffic and Transport Plan].

Ôs Gravenhage, *The Netherlands: Ministerie van Verkeer en Watersstaat* (Dutch MoT) (in Dutch).