Potential of Using Machinoeki as Push Factor to Encourage Community Walking in Town

YAS Harumain1*, NA Nordin1, NF Azmi1, Osada Teppei2, Morimoto Akinori3, SF Zaini1

1 Faculty of Built Environment, University of Malaya, 59200, Kuala Lumpur, Malaysia
2 School of Regional Design, Utsunomiya University, 7-1-2, Yoto, Utsunomiya, Tochigi, 321-8585, Japan
3 School of Creative Science and Engineering, Waseda University, 3-4-1, Okubo, Shinjuku-ku, Tokyo, 169-8555, Japan

Corresponding author: adilah_shamsul@um.edu.my

Received: 18 November 2019 • Accepted: 11 October 2020 • Published: 31 October 2020

Abstract

Prior studies have identified that enhancing a city’s walkability could be helpful in revitalizing an old, decayed or blighted downtown. While the benefits of walking are obvious and have been widely explored especially in terms of health and environment, this paper explores the potential of Machinoeki as a push factor in changing the mindset of a community about walking. A pilot survey was conducted to understand the interests of people in selecting their mode of transport and to communicate with the willingness of respondents to change their attitude by introducing facilities that can promote walking needs. To gather a collection of respondents and further to illustrate the role of Machinoeki, a simple random sampling method was used. The paper concludes that while Machinoeki has the right facilities to encourage walking, more research is needed to demonstrate the link between facilities with the community’s preference for walking in town. In this analysis, however, we found that the Machinoeki components have the potential to be a push factor with respect to the positive responses of 72 percent of respondents to Machinoeki's ability to encourage walking.

Keywords: Walkability, Machinoeki, Public Transportation, Taiping

INTRODUCTION

This paper is written on the basis of a pilot study on walking in town. Using a simple random sampling, respondents of this survey were selected to prevent bias on the survey data taken on their walking or driving to the city preferences. The data were collected at the town centre in Taiping, Perak, a heritage town that was recently recognised as the number third most sustainable city in the world according to the International Tourismus-Borse (ITB) in Germany on March, 6th, 2019. The objective of this pilot study is to understand the behaviour of the community transport mode preferences while understanding their mind-set about walking. This survey was undertaken before a concept from Japan called Machinoeki introduced to the town community. The point of departure for this paper is to investigate whether the typical mindset and perceptions on walking can be altered by the improvement of the built environment features such as the introduction of Machinoeki.

Walking has been recognised as one of the indispensable travel modes that contributes to the well-being and sustainability of a town. It helps to reduce problems associated with motorised transport, such as traffic congestion and carbon monoxide emissions, by prioritising walking as a significant travel mode that helps maintain the environmental sustainability of a community. In addition to that, improving the walkability of a city may help foster social interactions and build a sense of connexion to the city's physical attributes. In other words, through the dense interactions of its people and their ties with the physical characteristics of the city, such as its structures, landscapes and monuments, it could potentially help preserve and revive a city. Through walking, one will be more aware of one’s surroundings and as appreciation towards the town increase, it could potentially increase one’s sense of belonging to the town. As previously mentioned by Husnén (2017) in a study on the role of urban heritage in promoting sustainable public realm in Abu Dhabi, it is often the physical features of a city that bestow a sense-of-belonging to its dwellers.

Nevertheless, walking is the least preferred transportation mode especially in Malaysia. Clark et al., (2014) identified that unpleasant weather and poor road condition are among the factors that discourage people from walking. A study by Mouada et al., (2019) in a study on walkability in hot and dry regions found that outdoor thermal comfort as one of the important contributing factors that needs to be addressed in order to promote walking. Other factors such as land use pattern, travel time, and distance also appear to be factors that contribute to walking tendencies. For many people, walking is the least preferred option even if the destination is within walking distance. This can be observed in urban areas that were mostly designed to be automobile based instead of walking. It has been widely discussed on how the physical environment of a town contributes to the sedentary lifestyle of its people. Land use pattern that developed from single-use zoning that is commonly found in many parts of the cities in Malaysia discourages walking as it increases walking time, for example from residential areas to retail areas.

A paper published in Nature concluded Malaysia ranked third from the bottom in terms of walking behaviour from 111 countries with having an average of 3,963 steps a day per person. The top in the list was Hong Kong with its residents taking an average of 6,880 steps daily (Althoff et al., 2017). The study was analysed using smartphone data of 700,000 people by measuring how many steps people take every day using the step-tracking apps in their smartphones, the study further shows that Singaporeans recorded a high number of steps a day with 5,674 steps although Singapore shares almost the same weather and geography condition like Malaysia. The key findings from the Stanford study highlighting how crucial a well-designed pedestrian-friendly city to encourage walking and promote higher levels of pedestrian travel. Notwithstanding the fact, Malaysia still holds the highest overweight and obesity rates in 2015 (Institute for Public Health, 2015) although city like Putrajaya is a well-designed city for walkability. This demonstrates that just by having a state-of-the-art pedestrian facility may not be
the only factor that would encourage people to walk and there could be other factors that contribute to the unwillingness of the people to walk. The core reason that leads to poor motivation in walking is subjective and remains as a huge gap in the research field. Hence, it is vital to investigate the mindset of people about walking especially in a developing country like Malaysia. Is it because of the sunny and damp weather or is it because of the condition of the road infrastructure and city planning or is it just because of a typical mind-set?

It is possible to describe the mindset loosely as a way of thought. Mindset is the collection of thoughts and beliefs that form a person's thinking habits, and how people think, what they feel, and what they do are affected by thinking habits. These will influence how the world makes sense to them, and how they make sense of themselves. It helps to understand attitudes and beliefs. Dweck (2012) describes that individuals are differed into two different mindsets that are fixed-mindset and a growth mindset. Fixed-mindset individuals believe that their basic qualities such as intelligence and talent are fixed traits and nothing could change them. In contrary, growth mindset individuals believe that most basic qualities can be developed through determination and dedication.

According to Sailin and Pesso (2017), mindset as a concept includes valuations and interpretations, and this mind-set normally binds environments and individuals together on mental level. Dweck (2012) further argue that changing mindsets is an easy matter. The author explains that one can change mind-sets by simply explaining how the brain works. Understanding the root of common Malaysian’s belief and attitude can help finding a right way to change their mind-set on walkability. As defined by the Oxford Dictionary (2013), an attitude is a settled way of thinking or feeling about someone or something, typically one that is reflected in a person’s behaviour. Fang et al., (2004) elaborates that mind-set consists of three domains: cognitive, affective and behavioural. Based on this understanding, Sailin and Pesso (2017) further elaborate that walking in an urban environment could help in stimulating these three domains. Through walking, one gains a deeper consciousness of its physical environment through the display of tangible materials and this provokes one’s curiosity and understanding of a place. In other words, walking is not just a means to an end, but an experience (Simon et al., 2012). Walking through an urban space, one begins to reflectively interact with the environment, consolidating one’s relationship with the urban space (Seamon, 1980).

Through this phase of navigating and portraying urban space, thoughts and appreciation of space are beginning to evolve. Walking creates opportunities for social interactions and exchanges and produces interesting experiential knowledge for community development. These may also boost engagement in the process of urban revitalization among community members as opportunities for social interactions increase. On the contrary, high dependency on auto-mobile travelling decreases the opportunities for social interactions due to the nature of travelling. It is observed that in many urban areas in Malaysia, parents send their children to school by individual transportations due to safety concern. Nevertheless, in Japan, kids go to school by themselves. Japanese parents will take turns in order to keep an eye on the children crossing busy junctions. Not only does this sense of volunteering make it safe for children to walk, but it also encourages community growth.

There are many factors that have been identified as challenges that discourage people to walk in Malaysia. Ariffin and Zahari (2013) argue that the highest factor of reluctance to walk was the weather followed by safety from crime. The most fundamental factor that can motivate them to walk is the weather. In other countries, research on the value of weather conditions in order to motivate people to walk support this belief. Because of the unpredictable weather and the sweating and body odour it can cause for some individuals, walking in a tropical country like Malaysia can be difficult. In terms of urban design, walkability means allowing people to be able to use walking as a dominant mode of transport either for work or leisure. Walkability is not just about providing
walkways for pedestrians, but it is about making a place interesting and conducive to walk. This can be achieved by providing enough lighting and shades and ensuring barrier-free access to the disabled and senior citizens. Apart from ensuring safety and comfort for pedestrians, walkability is also about making a place interesting and enjoyable to walk. Ewing and Handy (2009) suggest that individual reactions can be measured by the attainment of a sense of safety, sense of comfort and sense of interest, and these are influential in making a place more walkable and hence influencing walking behaviour. In the earlier part of the paper, it was highlighted that mind-set can be changed through the alteration or simulation of cognitive, affection and behaviour. Based on this principle, the mind-set to walk perhaps can be changed by provoking the interests of the pedestrians who navigate an urban area. Sailin and Pesso (2017) concluded from their study that a place with nostalgic and historical values created a feeling of presence or what they describe as slowing and lingering time.

**METHODOLOGY**

Between September 2017 and October 2017, a total of 100 respondents participated in the survey in Taiping city. The aim of the survey is to identify their choice of mode and to explore the potential of walking when a facility was implemented in Taiping town to facilitate walking for those who are not interested in walking. Enumerators walk around the area, get input from respondents and answer the survey questionnaire. Simple random sampling has been used such that everyone has the same ability to adjust the mode of walking without prejudice between certain levels of education, socio-demographic history and other circumstantial economies, as walking is an alternative mode not unique to any individual for everyone. It was necessary to ensure that, based on population size and heterogeneity, the sample size required represents the population value of a variable. The most critical factor to be taken into account is that the population sample must be representative so that the researcher can draw inferences or generalisations from the sample data to the population studied (Chua, 2006). In defining the data found in this survey, descriptive statistics are used to describe the data found. During the survey, the Machinoeki concept was introduced to the respondent by giving pamphlets and overview about the concept. Will they walk if there is such a concept in Taiping?

*Machinoeki* or also known as “Human Station” is a step taken to revive city centres and create a friendly environment in the town in Japan. "Machi" means city or community, and "Eki" means station. This concept was not in place yet in Taiping when this survey was conducted. The establishment of this concept was made after this survey was conducted therefore; communities don’t have any clue about the concept. Thus, the survey undertaken is solely to understand the community’s mindset about walking. The Machinoeki concept embodies the idea of hospitality, create sense of belonging among the community and what is more important is to encourage the revivified of the town which is currently missing in today’s world. The original idea of the concept implementation was initially to revive the town due to population decrease. The foundation in Machinoeki concept is to provide a pedestrian or town community a place where they can rest, get some information about the town, a pit stops for pedestrian to use the toilet for free, and a place for social exchange between visitors and residents.

In Japan, the participating building owners volunteer to be Machinoeki masters by dedicating a space in the building for pedestrians to rest, to use the toilet for free and provide information to the pedestrians or tourists in the town. The use of the existing buildings in the town or particularly the locally significant buildings indicates that the concept does carry the spirit of community sustainability. This is a stimulating concept as a community also works voluntarily to help the local government to revitalize the town through hospitality which means providing good services. The concept inspires by the idea of hospitality and community involvement in town which
benefits many Japanese town renewal. The idea of involving the community as a mechanism for urban renewal can be observed in China. Ling, Yu-Ze et al., (2018) recognize the importance of strengthening cultural and social capital to improve the social and spatial environment of an old community. The authors relate this with the success of several community-based initiatives that not only enhance the aesthetical environment of Yuzhong district, but also increase residents’ sense-of-belonging to the town. The authors further elaborate on five standards of good community:

“It should be full of vitality, it should have one or more spaces of assembly or social centres; it should have a collective consciousness; it should have an environment that promotes social and cultural atmospheres that are cherished by the people living in it; and finally, the ultimate goal of community development, planning and construction, it should be promoted by the people living in it”.

Ling et al., (2018), pg. 5, para 1

Walking in a heritage town can be stimulating and interesting. Like many old towns in Malaysia, Taiping is blessed with many pre-war shop houses with Western facades – a unique architecture found in South East Asia particularly in Malaysia and Singapore built from 17th to early 20th century. This design feature had an influence from Chinese immigrants and the colonials. The shophouses in the historical town of Taiping used to be common gathering places. Most shop owners used to live above the shops while they sold goods at the lower level. The idea of introducing Machinoeki in Taiping was inspired by the potential of the town to showcase the beautiful buildings by having some of these buildings as Machinoeki. Only by walking, the pedestrians can have a closer look at the features which could help in promoting a sense of pride especially to the residents. The introduction of Machinoeki may be able to revive Taiping’s livability which has been suffering from dilapidation. This can be observed by the existence of vacant and ill-maintained buildings in the town center as a result of the establishment of the newer development schemes that taking over the economic function of the original town center. The introduction of Machinoeki may be able to promote more people on the streets in the town center and this will help in reviving the livability and the economic functions of the heritage town as declared in the National Physical Plan 2 (Ministry of Urban Wellbeing, Housing and Local Government, 2010).

In Japan, Machinoeki does not require new buildings as they operate in existing business establishments with their owner’s volunteer as Machinoeki masters. As highlighted by Koike et al., (2005), the core elements of Machinoeki concept involve providing free toilet and hospitality to the visitors, community learns about giving, tolerance and creates interchanges. The local government plays an important role in ensuring the project remains viable as the community mindset changes from “receiving” to “working together” with the local government. In a nutshell, will the community walk if there is a Machinoeki concept?

RESULTS AND DISCUSSION

The measurement of mindset towards walking is conducted towards respondent’s preference of mode of transport in Taiping town. Based on the survey as shown in Table 1, only 3.2 percent of the respondents would want to walk around the town while majority of them used private vehicles. This is due to many reasons such as distance from home to town, safety issues while walking and the reliability of the public transportation. This is not surprising as more Malaysian perceive walking as their last choice of travel mode around the town.
Table 1: Preference of mode of transport among respondents in Taiping Town

<table>
<thead>
<tr>
<th>Mode of transport</th>
<th>Frequency (N=100)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Cycling</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Public transport e.g. bus, taxi services</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Private vehicles</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>Did not answer</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 2 shows the cross tabulation between 93 respondents’ choice of modes of transport with their age in Taiping. As shown in the table, respondents with the age between 18-25 years have the highest usage of private vehicle and zero usage of public transport. Based on the data findings, it seems that the younger respondents have a higher dependency on private vehicles in Taiping town.

Table 2: Cross-tabulation of 93 respondents based on age group and mode of transport in Taiping Town

<table>
<thead>
<tr>
<th>Mode of transport</th>
<th>Age group</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18-25</td>
<td>26-35</td>
</tr>
<tr>
<td>Walking</td>
<td>5%</td>
<td>-</td>
</tr>
<tr>
<td>Cycling</td>
<td>5%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Public transport</td>
<td>-</td>
<td>10%</td>
</tr>
<tr>
<td>Private vehicle</td>
<td>90%</td>
<td>83.3%</td>
</tr>
</tbody>
</table>

This finding also suggests that to encourage more people on the street, more effort should be directed to influence the younger generation switch mode to walking. Changing younger generation mindset are more daunting as their dependence and lifestyle are more spectrum than the older generations. Figure 1 shows the respondent’s willingness to walk or cycling and using public transport services in Taiping if the facilities provided are enough and convenient. Majority of the respondents are willing to walk, cycle, and use public transport with 72% while the remaining 28% of the respondents were constantly preferred private vehicles because of several reasons listed in Table 3.

From Figure 1, this study found that 28% of the respondents answered “No” when they were asked about their opinion on walking compared 72% of them are interested to walk in the town. Further queries were later asked to the 28% respondents as stated in Table 3 below. Table 3 indicates that there is a potential for them if walking comfort and reliability of using public transportation are given highest priority. In addition to that, if these factors are better than using private vehicles, it is possible that the use of private vehicles can be reduced. These will lead to the potential of walking in the future.
Interview undertaken also found that weather and safety are the significant factors that lead to the discouragement of the respondents towards walking hence increasing the number of private vehicles use. As a response to the issue of weather and safety, any facilities can be used to solve issues like weather and safety. In this case, the idea of Machinoeki can provide the solution as a pit stop during raining and a temporary shelter in the case of emergency. In addition, more building participate in Machinoeki will increase “eyes on the street” which will also intensify the safety surveillance in the town giving more security to the area. This is also in line with studies conducted by Ariffin and Zahari (2013), found that facilities in cities and towns as one of the factors that motivate people to walk.

Table 3: Reasons for respondent’s choice for saying “NO” to walk in Taiping town.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Frequency (N=28)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owns a private vehicle</td>
<td>9</td>
<td>32.5</td>
</tr>
<tr>
<td>Comfort and ease of movement by private vehicle</td>
<td>11</td>
<td>39</td>
</tr>
<tr>
<td>Age and health factor</td>
<td>1</td>
<td>3.5</td>
</tr>
<tr>
<td>Public facilities are not satisfactory</td>
<td>1</td>
<td>3.5</td>
</tr>
<tr>
<td>Less public transport service</td>
<td>1</td>
<td>3.5</td>
</tr>
<tr>
<td>Cost and time management</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Live outside of town</td>
<td>3</td>
<td>11</td>
</tr>
</tbody>
</table>

The study result shows 72% respondents from 93 data collected has interest to walk in Taiping town if such facilities like Machinoeki are provided. The positive responses were a good sign to us that the community has the intention to walk in town but for some reason that they are not able to do so. Further investigation must be conducted to further understand the reasons in future. In the same survey, the 28% respondents who said “No” even if such concept like Machinoeki exist in Taiping was further investigated. From the investigation towards the 28% who said no that 39% of respondents care about their comfort and ease of movement when moving in town. Thus, private vehicle is more preferred than public transportation. In addition to the high percentage of respondent’s car ownership, it is found that other attributes reasons quite low. This clearly explains that other factors such as age and cost are not really the main reason for not walking in town. Although the pilot study is not strong enough to relate Machinoeki and walking in town, we found that the Machinoeki components has a potential to be a push
factor with regards to 39% of respondent’s responses on comfort and ease of movement reasons to use private vehicles. With the improvement of public transportation in town, more people will have better options and access to walk in town and Machinoeki will then be able to provide the facilities that are needed for walkers such as resting areas, free toilets and information centre. The result can be a starting for many study in future on comfort and ease of movement needs for many people in determining their transport mode preferences.

From the data, this study finds that the level of comfort is important and that most respondents have to choose private vehicles. Therefore, any unorthodox option and ways to shift a person's mindset from driving private cars to walking must maintain the comfort factor's significance. Machinoeki concept will be able to give comfort during walking as it provides a space for relaxation, toilet facilities and a space for interaction. During bad weather, it may also serve as a temporary shelter and a security point during an emergency. In order to gain confidence from individuals to change their mode, however, the local authority also needs to provide efficient public transportation. In order to ensure that the definition is appropriate in Malaysia, the methodology must fit the landscape of Malaysia. As discussed in the earlier part of the paper, stimulating interest and cognitive may influence the mindset change, thus it is felt that Taiping already has the potential due to its heritage pre-war buildings. Will Machinoeki able to make the community walk in town? As pointed out by Seamon and Sowers (2008) on Relph (1976) and Shamsuddin (2011), the attributes of buildings are more meaningful and distinctive when they facilitate or reinforce certain activity pattern. Certainty, many activities can be achieved through the implementation of Machinoeki in Taiping. Among activities that can be done through Machinoeki such as community-based programs, information centre for tourist and meeting points. In addition, it is also a way to encourage community participation in the town that encourage social interaction and positive communication. In a larger context, these activities not only influence the distinctiveness of the buildings but also the town itself as good towns with distinctive identities and characters need an element of chaos (Montgomery, 1998). In a nutshell, it is anticipated that this concept is potential to promote more people to walk but it is very early stage to see the impact of this concept but clearly deliberates potential to change the mind-set. From the respondent point of view after the introduction of this concept, almost 99% of the community think about the positive outcome of this concept towards walking motivation in the town. It is also anticipated that there will be differences in view between tourist and local community perception about Machinoeki.

Similarly, in Japan, the implementation of the concept does not involve change of any structures or constructing new building. It relieves the local authorities in providing services to the tourists and visitors, and it helps in building the capacity of the participating premise owners and managers. By involving as service providers, they will be able to generate their own solutions that are appropriate to the infrastructure and materials available without relying much on the local authorities. In Japan, the concept of Machinoeki has proven to be able to enhance the social capital of the communities involved through the network of the Machinoeki owners. They are not only confined to their own businesses but connect with one another through event and campaign organizations. The interaction and unity among Machinoeki owners are an important step towards creating community participation in the town sustainability (Teshima et al., 2006). Having densely interconnected communities is an advantage to a community and its local authority as it helps.

CONCLUSION

In Japan, Machinoeki existed to compliment walking experience in town inline with their effort to revitalize Japan degrade town centre. According to the survey, issues arises due to walking in Taiping town such as comfort, weather
and safety can be solved by having Machinoeki in the town. The study also finds; respondents are willing to walk when such facilities like Machinoeki to be provided in the town. Walking is not a typical activity for many Malaysian communities nowadays especially for those who conveniently travel with private vehicles. In this effort, the survey involving ninety-three respondents in Taiping town were asked about their preference transport mode and perception to walk. Figure 1 showing the elements of Machinoeki that can potentially change the mindset of people about walking.

In short, when necessary facilities that encourage walking are given, the mindset of people about walking will potentially change. This study has given significant findings related to the reason for walking, and the implementation of Machinoeki in the city will address those reasons. The findings result shows that respondent in Taiping are willing to walk if there is such facility to support walking and with 39% responded on comfort and ease of movement needs when travelling in town. It is anticipated, when more building participates as Machinoeki owner in Taiping it will also reduce distance between Machinoeki allowing more people to used them. Public transportation efficiency will be the key to ensure this concept is do-able as more people will rely on private vehicles due to the comfort and ease of movement. Public transport must also be effective and secure for all levels of society, including the elderly and children. As they are not relying on their vehicle to drive, this would allow more people to walk in town. In order to further prove the link between the needs of facilities and walking, further research must be undertaken.

ACKNOWLEDGEMENT

This study is funded by Sumitomo Foundation Grant in 2016 and has received tremendous support from Majlis Perbandaran Taiping. Authors would like to thank Sumitomo Foundation and the Mayor of Taiping for the support.

REFERENCES


10