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Current Status of Cycling Lanes at University of Johannesburg

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Abstract

The aim of the study was to find out if the University of Johannesburg (UJ) students were aware of the cycling lanes which are found between the three UJ Campuses (Auckland Park, Bunting Road and Doornfontein). Furthermore, the study was interested in finding out the reason behind the low utilization of cycling lanes. This study was driven by the empty cycling lanes that have been around for almost two years since their completion and have mostly been under-utilized. Out of 600 students who were targeted to respond to the questionnaires, only 480 students responded. 66% of the students are aware of the cycling lanes and only 13% have already utilized the lanes. More than 80% of the students do not own/have bicycle for daily use but 60% of the students agreed that if there was a bike sharing system on the campuses, they would be willing to learn how to cycle as well as to use the system. It has been found that UJ students are not resisting to cycle but rather that there is a lack of awareness, relevant training programs and facilities. The research used a mixed method approach through observations and a quantitative survey.

Keywords
City of Johannesburg, University of Johannesburg, cycling lanes, bicycles and students.

1. Introduction

The aim of the study was to find out if University of Johannesburg (UJ) students are aware of the cycling lanes which are found between the three UJ campuses. Furthermore, the study was interested in finding out the reasons behind the low utilization of cycling lanes between the UJ campuses. This study is driven by the need to understand these near empty cycling lanes. There is evidence that an increased number of cyclers are encouraged by the strength of the numbers' hypothesis that per kilometre, it is becoming safe to cycle (Uttley and Lovelace, 2016). One of the obstacles discovered which raised attention during the research is that cyclists find cars parked in the in the cycling lanes (Engels, 2016).

Based on the results, 480 students participated in the survey, 66% are aware of the cycling lanes between the University of Johannesburg campuses. Out of the 66% of the students who are aware of the cycling lanes only 13% of the students used the lanes for cycling. This could be due to a lack of resources as, beside the day to day challenges which are caused by the lack of transport provision in South Africa, numerous studies when linking poverty and transport show that the hindering factors of mobility also affect the resources needed to alleviate poverty (Olvera, 2013). The study shows that 91.1% of the students do not have bicycles which they can use daily for riding between campuses. While the economic status of the students is not entirely known, only 3.6% of the students rate themselves as rich and 63.5% average and 32, 9% as poor.
The study discussed the background of the CoJ concerning cycling and cycling lanes. A review of the current state of cycling in the City of Cape Town and the town of Stellenbosch indicate that both cities have more cyclists using

the cycling infrastructure compared to the City of Johannesburg. The study reviewed the literature on cycling safety, culture, the importance of walking and cycling and the other modes of transport as compared to cycling.

1.1 Background of the study

It has been realized by the Gauteng Province Integrated Transport Plan (ITP: 2013) that transport in South Africa accounts for 31% in energy consumption while CO_2 emission accounts for 16%. ITP (2013) further states that the City of Johannesburg (CoJ) is an energy efficient city in global and national terms but inefficient in relation to cities in developed countries. Cycling is getting amplified attention worldwide as a means of solving problems encountered due to urban transport, Parkin (2015) and Goodman (2013). The CoJ had developed cycling lanes, through its strategy of encouraging transport mobility through cycling, (Lekgothoane, 2015), there has been a less than expected participation from the public. According to Juca (2014), cycle lanes run between the UJ Kingsway Campus and the UJ Doornfotein Campus and are also intended to cater for members of the public who are commuting between Hillbrow and Park Station including those who are commuting between Park Station and Mellville. The length of the route is approximately 15 km. These lanes are also extended to other places in Johannesburg's major places of entertainment such as Monte Casino and Emperors Palace in Sandton. It also connects Rosebank to Sandton and Alexandra to Sandton, CoJ (2015). The scope of this study will be on the university corridors focusing on the students and staff at the University of Johannesburg. According to Juca (2014), this route is aimed at connecting students and staff members of both UJ and Wits. It runs between the UJ Kingsway Campus and the UJ Doornfotein Campus. Since the implementation of the roads between the three campuses of the University of Johannesburg as well as the connection with Witwatersrand University, too few cyclists are seen using the lanes during peak as well as off-peak times. This could be due too various barriers amongst which are the socio–economic challenges the city is currently experiencing. Other barriers include the issues of security, affordability by the students or lack of awareness. This study will also be doing a comparison with Stellenbosch University which also has cycling lanes since 2004 to date.

1.2 Problem statement

The government and local municipality is investing in cycling facilities with the perception that offerings of a cycling lane will encourage the society to use bicycles as a mode of transport (Dill and Carr, 2003). The lanes in the city, particularly those along the three campuses of the University of Johannesburg (APK, APB and DFC) are not yet being utilized after being implemented for a year. The aim of the study is to find out the main cause of failure, resistance or other factors that affect the utilization of the cycling lanes by UJ students within the City of Johannesburg area. The CoJ is faced with mobility challenges and the current mostly used mode of transport affects the environment negatively (Lekgothoane, 2015).

1.3 Objective of the study

The aim of the study is to find out if the University of Johannesburg students are aware of the cycling lanes around the University campuses as well as:

- To find out why there has been less utilization of the cycling lanes since their completion.
- To gauge the students' willingness to participate in the bicycle hiring facilities if the necessary training and facilities are provided.
- To find out what other barriers there are that could influence utilization of the cycling lanes and cycling around the campuses.

2. Literature Review

The study covered the literature based on the important facts of cycling, by reviewing literature on cycling initiatives as well as considering how the City of Johannesburg, City of Cape Town and the town of Stellenbosch have done their respective cycling initiatives thus far. The second objective of the literature review is modes of transport. According to the survey results, students perceive cycling more as a sport and fun rather than a mode of transport. Out of 475 students who responded to the question only 21.4% chose cycling as a mode of transport. The third point is the importance of cycling; it is also of interest to know the reason for or positive impact of cycling. In developing countries today, there is heavy traffic to and from work which is dominated by motorization (Engels, 2016 and Pojani and Stead, 2015). Cycling has economic benefits such as reduction of traffic and faster arrival times while it increases the productivity of the workers and reduces individual travel costs. The Figure 1 below illustrates the starting point initiative and outlines the various aspects that will be discussed.

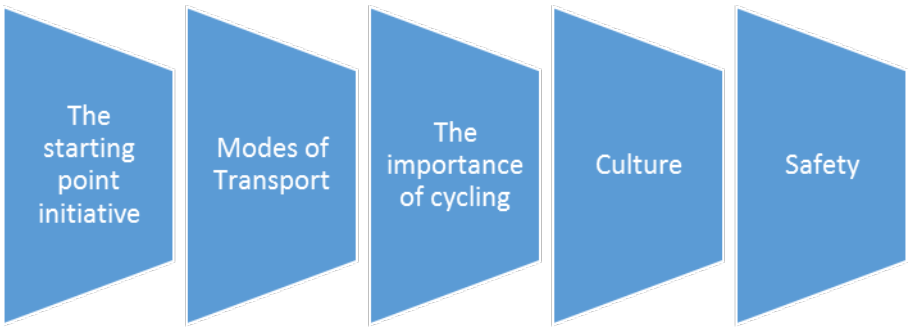

Figure 1. Literature flow of the study

2.1 The starting point initiative

Cycling is one of the modes of transport which is gradually been more recommended and its infrastructure is improving to promote physical health and the safety of the environment (Ogilvie et al., 2011; Sietchiping, et al., 2012 and Goodman, 2013). The starting point of a public bicycling initiative is to first start with the people who have been cycling. The CoJ kick started the bicycle initiative with the aim of targeting an existing constituency as potential bicycle users among low income earners and university students (Kane, 2015). The challenge sitting with government now, is to find a way to provide affordable, safe and accessible public transport to both township, rural and urban areas (Walters, 2013). Kane (2010) asks a pertinent question to support this statement by namely: How will South Africa achieve sustainable transport while addressing inequality and poverty challenges the country is currently facing?

Kane (2015) states that in 2013 the Institute for Transportation and Development Policy (ITDP) issued a guide for a bike sharing plan with the aim of bridging the gap between developed and developing countries. Among other cities was the City of Cape Town and Johannesburg, where the City of Cape Town managed to welcome the initiative successfully unlike Johannesburg. The initiative has been widespread in the cities mainly during the 2010 World Cup, Wilkinson (2010) states that it was due to responding to National Government policy directives. The City of Johannesburg is still struggling to drive this initiative as part of its public transport strategy. According to Wilkinson (2010), Cape Town took this initiative seriously and committed to comprehensively transforming their public transport.

The City of Cape Town adopted positive reasons for cycling from Travelsmart in order to ensure the city promotes staying physically fit and health and transport sustainability, when comparing car travel and cycling, bicycle travelling is cheaper, healthier, greener, quicker and better. Travelsmart is the bicycle sharing system operating in the City of Cape Town together with other organizations who are also in the bicycle sharing scheme. Kane (2015) states that currently the City of Cape Town has a number of organizations offering bicycle rentals in the City as well as near Stellenbosch University.

The unemployment rate in the Western Cape is not as high compared to the Gauteng Province (Figure 2.1). As the study is concentrating on universities which are situated in two different provinces, the backgrounds of the provinces are slightly different. Stellenbosch Municipality in the Western Cape is the local municipality that governs the towns of Stellenbosch, Franschhoek and Pniel, and the surrounding rural areas. According to the 2011 Census, the province's population growth rate is 2.6% from 2001 to 2011 while the City of Johannesburg is 3.18%, with a 25% unemployment rate. The Stellenbosch unemployment rate ranges from 15.2% to 16.9%. Based on the latter it can be concluded there is not a significant difference when comparing Stellenbosch and the City of Johannesburg. They could be facing the same socio economic challenges.

Stellenbosch University has a cycling team as well as students and staff who are using the cycling lanes for transport. Stellenbosch as a town already has cycling shops which are competing with selling and hiring bicycles.

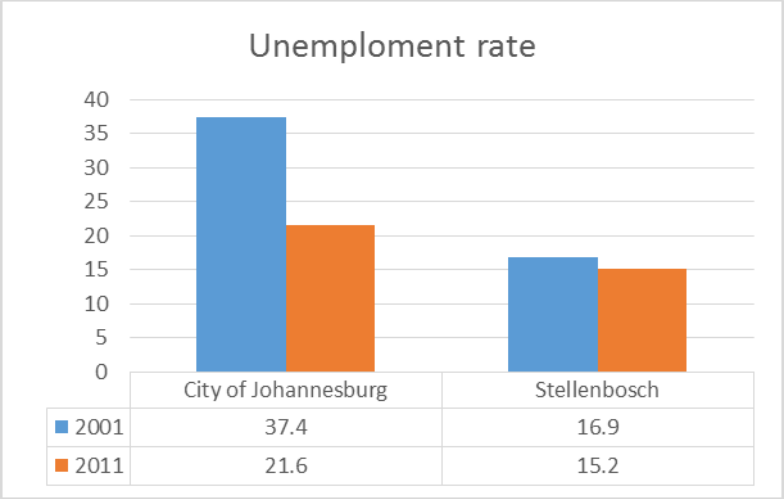

Figure 2.1. City of Johannesburg and Stellenbosch unemployment rate comparison

2.2 Modes of transport

Most University of Johannesburg students are using the University Shuttle buses to travel between the campuses and their accommodation which is sometimes off-campus. Some use minibus taxis as well as the Bus Rapid Transport System to travel between campus and their homes. In the survey that was conducted during this study, students were asked where they were residing and had to indicate whether they lived on-campus or off-campus. The results show that out of 473 students who responded to this question, only 95 students live on the campus. The figure below illustrates the number of students who are living on campus and those who are living in residential areas. Most of the students who are living off-campus are relying on some form of motorized transport. Most of the people choose a mode of transport that is fast and reliable, and many people's perception that motorized transport is the most efficient mode of transport apparently is not always the case (Jacobsen and Rutter, 2012). The off-campus students are disadvantaged as they spend some of their time travelling to and from the university losing out on some productive time which they can use to study (Mbara and Celliers, 2013). Bus, mini-bus taxi, tuk-tuks and BRT are the most popular modes of transport currently.

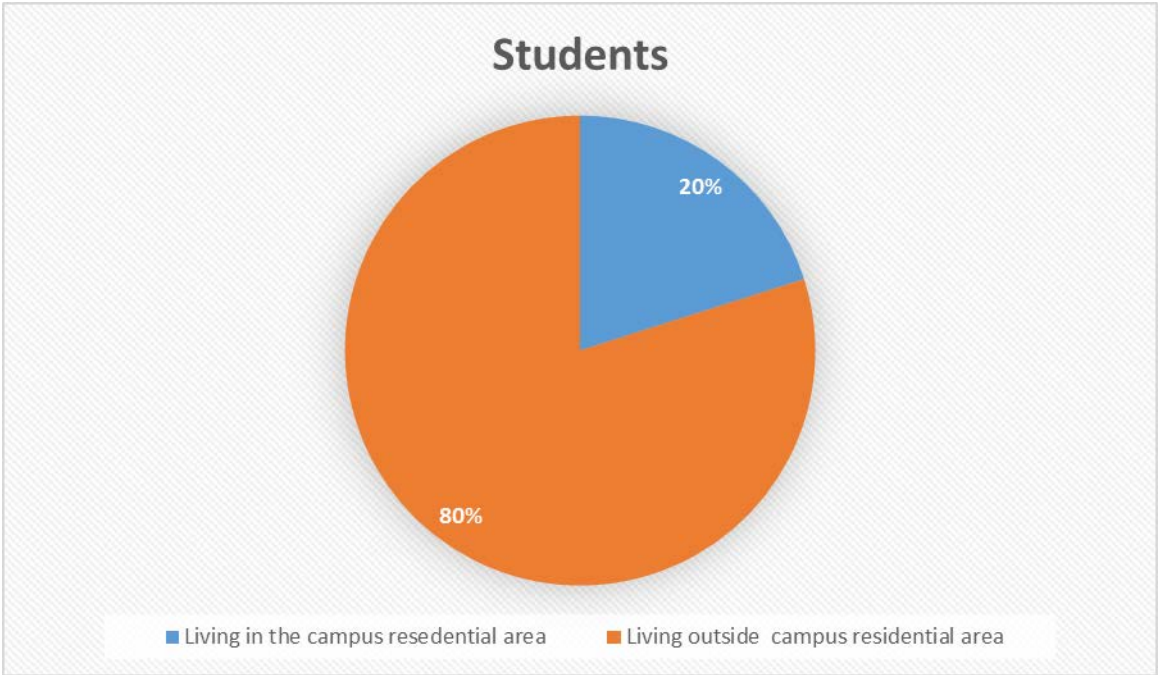

Figure 2.2. Students living in and off campus

Of the respondents, 50% live on the campus or 5 km or less to the campus. According to Sa, et al. (2016), students who live closer to campus (5 km or less) can commute using a bicycle, likely, three times daily. Suleman et al. (2015) state that a key imperative for South African cities is to move away from privately owned cars towards mass public transport, cycling and walking as this will reduce traffic congestion and road maintenance costs, improve accessibility, increase spatial efficiency and achieve better public health outcomes through improved air quality. Suleman et al. (2015) further states that at the same time, this modal shift will reduce GHG emissions associated with transport. This is depending on the ability of South Africa first rectifying the main challenges which happen to be the main priority other than sustainable transport.

2.3 The importance of cycling and walking

Currently, transport sustainability is rated as unsustainable (Steg and Gifford, 2008 and Gossiling, 2016). According to Steg and Gifford (2008), extraordinary interventions have been expected for a behavioural alternate to reap sustainable transport. Nasrudin (2014) mentions that it has not been found effective for calls for individual behaviour change towards more sustainable mobility by modifications in tour behaviour due to the modern-day unsustainable improvements in transportation. Gössling (2016) states that public transport systems - cycling are typically understood to have essential roles in sustainable city transport designs, whilst motorized transport is considered to cause many of the problems associated with transport systems. Nasrudin mentions that the motives supplied as barriers to biking are, taking walks in warm weather, surrounding security factors, unsatisfactory biking tracks and bad condition of pedestrian lanes. Among the motives put forward is the fact that respondents are no longer influenced to use public transport that has inefficient offerings and high-priced fares. Most economists assumed incorrectly that accelerated mobility results in the intended financial benefits for the social and environmental costs. However, Litman and Burwell (2006) argue that the most useful level of increased motor vehicle tour can have adverse economic effects due to the fact that the marginal productivity of elevated tour is declining with automobile use imposing exterior prices that can offset the direct financial gains and also redefine the social environment. Litman (2016) states that there are countless validations for creating goals to limit the automobile journey. This he argues, helps to remedy various complications and furnish a variety of advantages for making future travel needs ready and assist to enforce market reforms for greater environmentally friendly and equitable transport systems.

An increasing involvement of psychological and sociological theories in transport lookup is aimed at a deeper understanding of motives and outcomes of journey behavior. Although there is an extensive public presence and complete expertise about environmental and sustainability issues, these are not accurately mirrored in person travel decisions.

2.4 Safety

A study by Oke et al. (2015) on bicycle ownership in 150 countries determined that the weighted mean percentage of ownership ranged from 20%-81%. This finding still lacks additional research as the reasons for such ownership could be different especially in the African region. Safety could be also be a factor that can be attributed to the mentioned low number. Other factors presented by Oke et al. (2015) are the generally geographically inhospitability of some areas for bicycles as a result of deserts and mountains with particular reference to the Sahara in an African context. They suggest further collaboration between the public health and transportation fields as a way forward to advance the study.

Rissel et al. (2015) argued for the importance to understand the impacts of investing in new cycling infrastructure. This study explored the users of a newly built cycle path, looking at cycling behaviour in particular. This research, together with that of Wolf et al. (2015) seems to suggest that safety issues can be linked to the behaviour of cyclists. They further note that there was a 75.5% increase in injuries and hospital admissions (Ford et al., 2015) that can be attributed to bicycle accidents. Wolfe et al. (2015) did, however, observe a difference in their observation of Boston cyclists. These include obeying traffic signs, giving pedestrians right of way and the wearing of helmets. They also observed that designing educational programs and stricter law enforcement aimed at the mentioned safety behaviours should be part of the effort to improve safety for all road users.

Wilke and Buckley (2000) explored the effect of cycling lanes on safety and identified two categories namely actual as well as perceived safety. Perceived safety, they argue, is measured by characteristics such as separation between cyclists and cars and relative velocities. They further link actual safety to the frequency of crashes perceived.

A question that still remains unanswered in the literature reviewed, is wether there can be a direct correlation between safety concerns and the low use of newly built cycling lanes.

2.5 Culture

In all studies consulted in relation to cycling and cycling lanes, culture has been discussed only from the perspective of a cycling culture and refers to the historical use of bicycles as a mode of transport amongst groups of people. This study also aims to ascertain if culture influences people's decisions to cycle or not. Only when entering class, status, race or ethnicity as key search terms were better search results found.

Christie et al. (2011) in a study on disadvantaged children and bike use found that ownership was significantly lower in minority ethnic groups where only 2% cycled to school. Some of the barriers attributed to this included antisocial driving in residential areas as well as a lack of sufficient cycle training to improve children's skills. They also identified the risk of injury as a road user to be higher for people from the disadvantaged Black, Asian and Minority Ethnic (BAME) population. An important finding in their research is that of a small but growing body of evidence that linked socioeconomic status, ethnicity and road traffic injury.

Additionally, of those young people reporting that they had never ridden a bicycle, only 1 in 10 young white and black Caribbean reported having never ridden a bike compared to over 1 in 4 Indian, Pakistani and Bangladeshi young people. This seems to suggest that cultural orientation does play a role in the decision to cycle or not. It needs to be noted that this cannot be generalized as the study was focused on children between the ages of 9-14 years.

Pooley et al. (2011) took a different view in their exploration of culture and cycling and found that people from different ethnic groups would much rather walk than cycle, especially over shorter routes. Their case study focused on the decision making of households for everyday travel. They proposed that that policy should focus on ways of making walking and cycling more accessible and 'natural' so that it can be more conveniently fitted into household routines.

Steinbach (2011) contends that cycling is not a choice made equally across the population where it is rare, arguing that it is an activity of affluent White men. Different findings where made but the most notably in relation to ethnicity and that was driving it, instead of cycling was seen as a status of upward mobility. Another was that Black people were not used to cycling and that they generally don't do it. Most notable was the absence of Black women amongst those who did cycle. Additionally, cycling was also not covered in Black Media and equally Black cyclists where not covered in mainstream media. The issue of culture and the choice to cycle therefore goes wider than just culture but also the promotion and awareness creation to encourage people from different ethnic backgrounds to partake.

Grieco, Turner and Kwayke (1994) in their research conducted a study on ethnicity and cycling behaviour in Accra, Ghana in what seems to be a study that formed the basis of other studies that followed. This study was cited 28 times on mostly European journals when attempts were made to research issues of ethnicity and cycling. On the matter of gender, their finding is similar to that of Steinbach (2011) with regards to black women and their choice to cycle as well as the recognition and support they give each other within the larger, otherwise largely White cycling community. The same happens amongst women in a male Black male dominated cycling community in Ghana.

In contrast to Pooley et al. (2011) who advocate for policy on walking and cycling, Grieco, Turner and Kwayke (1994) advocate that cycling policy also incorporate head load carriers as they are an integral part of the city. Similar contrasts can be drawn to the Johannesburg context where recycling trolleys also use cycling lanes and there is currently no policy around them and their use.

A conclusion can be made that culture in cycling is broad and includes ethnicity, social status, gender as well as sub-groups (head carriers and recyclers). The African cycling context is therefore different compared to the European and American contexts and must be considered as such in cycle lane policy formulation as well as infrastructure building. Skreden et al. (2015) stated that active transportation is a feasible way to incorporate physical activity into daily life and has substantial public health and environmental benefits and has shown that people who use active modes of transportation (walking, biking and public transportation) to work increase their daily level of physical activity compared to those who use private transportation. According to Behrendt (2016), cycling is an essential and active sustainable mode of transport when compared with other different smart modes of transport like intelligent cars.

It can therefore be concluded that the cultural and other socio economic factors and role-players must form part of policy as well as envisaged cycle lane construction, particularly in developing countries.

3 Research Methodology

The University of Johannesburg has close to 45 000 undergraduate students and 6 500 post graduate students who are registered every year. The study only selected a sample size of 600 students targeting students from one department and from a few different modules. Four modules where selected which have approximately 150 students each and Blackboard was used to give out the questionnaires to students. Blackboard is an online learning and course management system that can also be used to communicate in various ways with students, including assessments and surveys. Out of 600 students, 480 students responded to the survey. There are 473 respondents from the students of the University of Johannesburg. The method of research study used is quantitative and qualitative research. An online survey was sent to students via a Blackboard notice. The qualitative research was in the form of comments from the students. The results and comments are coded and analyzed as in a quantitative research method and graphs were extrapolated from the data. A lot was learnt from the comments which was not being included in the survey questions. The comments also are one of the elements that led to the future research of this study.

The study is also based on the secondary data, by reviewing literature considering the scholars who published on cycling in the City of Johannesburg, Stellenbosch University as well as the City of Cape Town. Furthermore, government, civil society as well as public health related publications were consulted. Primary data collection tools used were interviews, observations and server questions. The research observed the cycling lanes around three UJ campuses and how often they are being used by the cyclists since the development of the lanes. Interviews were conducted with the manager of the cycling society and club in the University of Johannesburg. The aim was to find out what the University's stance is on the status quo relating to the existing cycle lanes and if there were any official plans. A future study will include staff to find out if they are planning to switch their modes of transport when commuting from home to work and back.

4 Results and Analysis

The following are the results of the survey that was given to students, the study targeted 600 students as the sample size of this study. Out of 600 only 480 students responded to the study and the following are the graphs that represent the results.

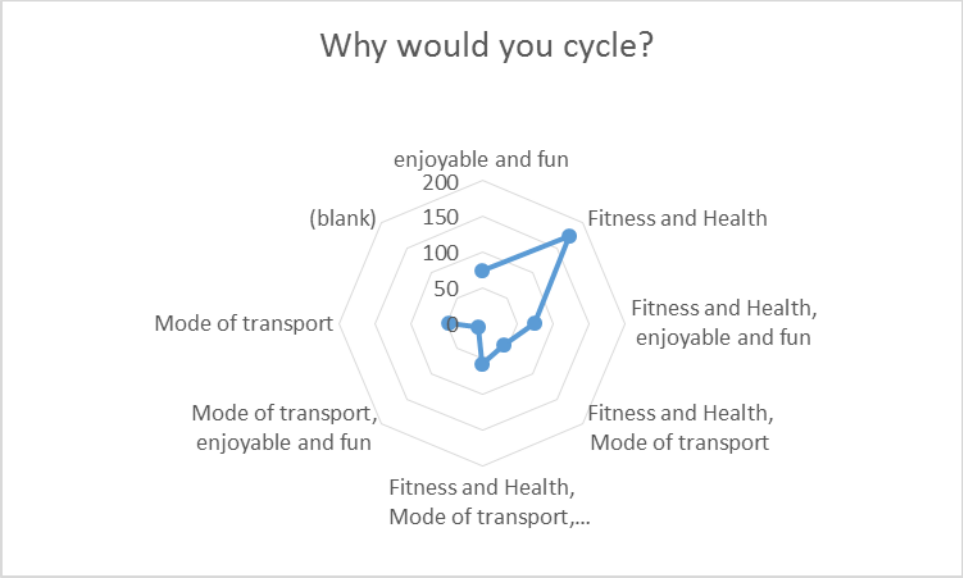

Figure 4.1. Why would you cycle

The questionnaire was a multiple response design, the respondents had an opportunity to select more than one answer to the questions asked. This was to give the respondents a chance to tell if they can use cycling for all the given elements. Fitness and health had the highest response which shows that students prefer cycling for health reasons rather than as a mode of transport.

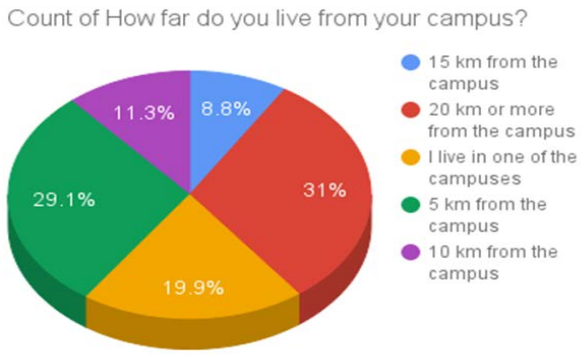

Figure 4.2. How far do students live from campus?

The students where asked how far they lived from the campus in the above graph. The aim of the question was to find out if the students will be able to cycle from their place of residence to the campus. The graph indicated that 29.1% of students live just five kilometers from the campus which shows that if cycling was seen as one of the modes of transport, students would be able to travel from their place of residence to campus.

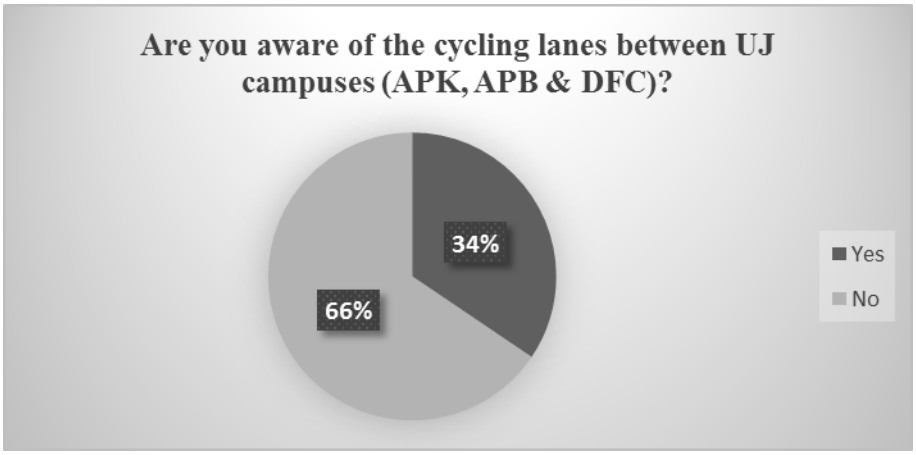

Figure 4.3. Awareness and Education

The majority of the students surveyed were aware of the existing cycle lanes, whilst 34% of the students were not aware. It is worth noting that the lanes were visible with the relevant signage showing bicycles. The fact that some students who were not aware can possibly be attributed to the fact that they are totally unfamiliar with cycling lanes, hence the need for more cycling awareness and education.

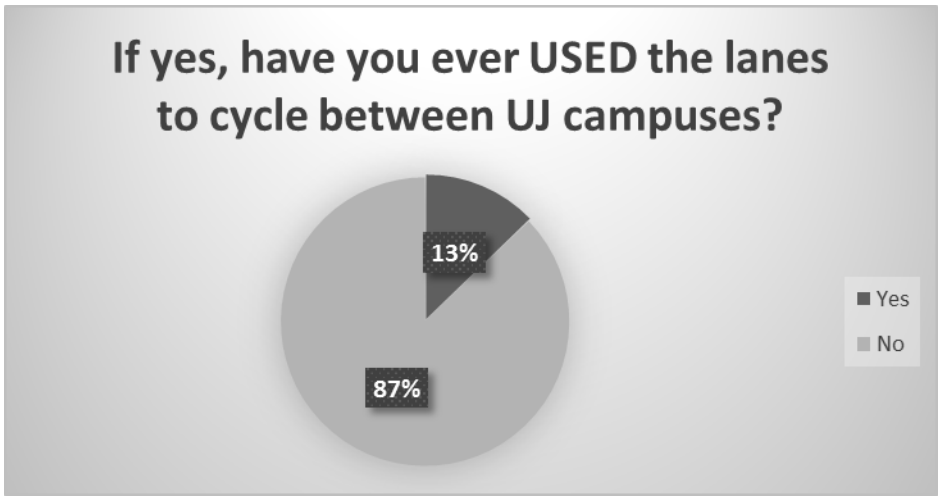

Figure 4.4 Usage of cycling lanes between UJ campuses

Out of the 362 people who responded to the question of bicycle ownership, only 53 people have used the lanes for cycling. This can be interpreted to mean that only 53 people have bicycles to use on a regular basis but only 38 people own bicycles.

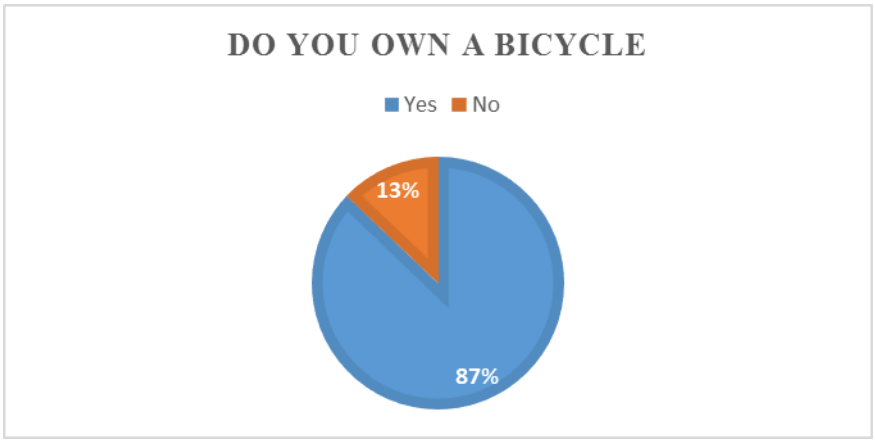

Figure 4.5. The impact of culture

The majority of the respondents do not own a bicycle, which means most do not have access to bicycles. This reflects more on the culture of the society, that 80% of the population do not have a bicycle to use on a regular basis.

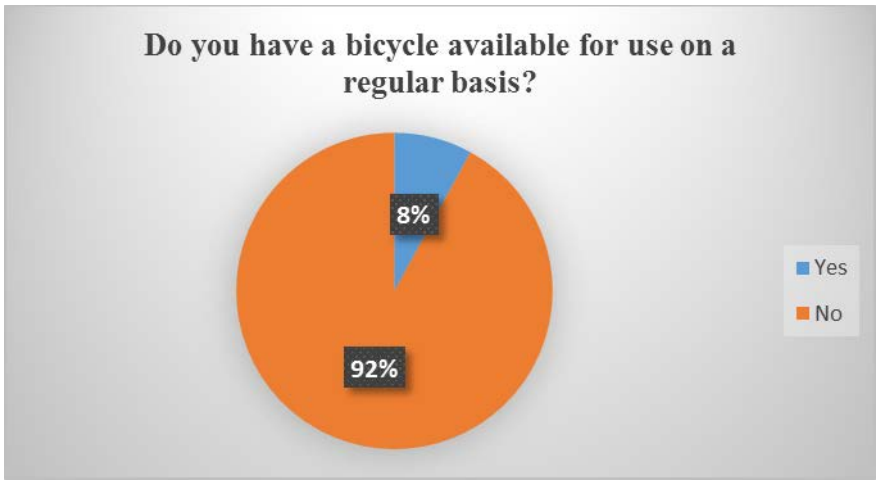

Figure 4.6 Bicycle to use on a regular basis

Only 8% of the students have a bicycle to use on regular a basis. Cycling is not in the picture here not for fun, transport or fitness. It looks like cycling is only enjoyed by a few students with a passion for it. As for the rest of the community, there is still a need for awareness programs on cycling as well as the availability of a bicycle hiring facility.

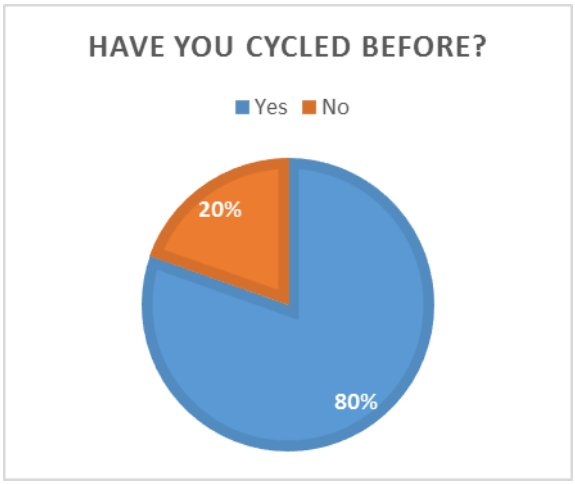

Figure 4.7. Have you cycled before?

20% of the respondents have never cycled before, while 80% of the people have cycled. The rate shows that the majority of those surveyed have and are able to cycle. Due to lack of a cycling culture and a bike sharing facility in the society as well as the dependence on cars, people do not frequently consider a bicycle as a mode of transport and rather opt to drive.

5 Findings

The City of Johannesburg has cycling lanes which cost millions of Rands with a further R70 million set aside for future cycle lanes. Looking into the emergence of cycling in the City of Cape Town, it can be deduced that socio-economic challenges such as unemployment are also playing a role in the development process of promoting cycling in the City of Johannesburg. The absence of a cycling culture amongst the majority of those surveyed is also a barrier due to the fact that there are people who never cycled before and most people wanting a faster rather than a slower mode of transport. Despite the fact that most of the respondents have cycled there is still a low utilization of the cycling lanes. All those surveyed were students and there is no cycling culture amongst them, based on the questions asked.

6 Recommendations

Education can be of great importance and the literature has proven that bike sharing is a crucial tool when initiating cycling. Through the survey results, students have shown an interest in learning as well as using a future bike sharing system to their advantage should it be available. They can therefore be the first group to actively and on a wider scale encourage cycling on campus as well as broadly within the City of Johannesburg.

7 Conclusion

Future research should be based on the assessment of cycling by checking the impact of cycling regularly, as most cities tend to increase the numbers of cyclists while other cities experience a decline in the number of cyclists. This is due to the barriers and other challenges that cyclists experience that are only realized at a later stage. Encouraging cycling is the responsibility of every stakeholder within the community. Close monitoring by every individual is crucial to ensure positivity that one can bring into the cycling community. Awareness and education is also important as a quarter of the students are not aware of the cycling lanes which were just around the places which they pass daily. Staff members must also form part of a future study to find out why particularly those in close proximity do not use cycling as an option. It is possible to increase usage of the existing cycle lanes over time provided all stakeholders and users work together.

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