

## STUDENTS' PERCEPTIONS REGARDING THE TABLET PERSONAL COMPUTER (PC) AS A MOBILE LEARNING DEVICE AT A GRADUATE INSTITUTE IN TSHWANE: AN EXPLORATORY STUDY

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### Abstract :

*The unfolding Fourth Industrial Revolution (FIR) has necessitated immense technological innovations in the educational sphere. To date, countable educational institutions in South Africa have introduced the Tablet Personal Computer (PC) to their students for academic purposes. However, perceptions regarding the Tablet PC as a mobile learning device has not been delved into in South Africa. This study has done such an exploration. The study explores the perceptions that graduate students in Tshwane hold of the Tablet Personal Computer (PC) as a mobile learning and management device. Data was collected from full-time undergraduate students using a web based online survey with a semi-structured questionnaire. A population sample of 277 respondents was selected using non-probability method in the form of convenience sampling. Data was analysed using descriptive and inferential statistics methods. The results of the study indicated that the majority of the surveyed students had a positive perception regarding the Tablet PC. Based on the research findings, limitations, recommendations and future research opportunities were suggested.*

### Abstrak :

*Revolusi Industri Keempat yang sedang berlangsung membutuhkan inovasi teknologi yang sangat besar di bidang pendidikan. Sampai saat ini, lembaga pendidikan yang dapat dihitung di Afrika Selatan telah memperkenalkan Tablet Personal Computer (PC) kepada siswa mereka untuk tujuan akademis. Namun, persepsi tentang Tablet PC sebagai perangkat pembelajaran seluler belum diteliti di Afrika Selatan. Penelitian ini telah melakukan eksplorasi seperti itu. Studi ini mengeksplorasi persepsi bahwa mahasiswa pascasarjana di Tshwane memegang Tablet Personal Computer (PC) sebagai perangkat pembelajaran dan manajemen seluler. Data dikumpulkan dari mahasiswa sarjana penuh waktu menggunakan survei online berbasis web dengan kuesioner semi-terstruktur. Sampel populasi sebanyak 277 responden dipilih dengan menggunakan metode non-probabilitas berupa convenience sampling. Hasil penelitian menunjukkan bahwa sebagian besar siswa yang disurvei memiliki persepsi positif tentang Tablet PC. Berdasarkan temuan penelitian, keterbatasan, rekomendasi dan peluang penelitian masa depan disarankan.*

## INTRODUCTION

With the rapid developments and innovations in technology across the globe, the wide use of the Tablet PC among the millennial generation has become evident. The Tablet PC became famous and has been widely used for educational purposes since its inception in 2009 with the introduction of Apple iPad. The present article addresses the perceptions that graduate students in Tshwane hold of the Tablet Personal Computer (PC) as a mobile online teaching and learning device.

Like any other institution, higher education institutions today encounter challenges across the globe as it is being reshaped by globalisation and digital revolution. According to (Mabelebe, 2015) higher education in South Africa faces several challenges including a decline in state funding, rising costs in education leading to a decline in students completing their degrees. Lack of institutional support, lack of e-learning culture, exclusion of academia from e-learning development programmes, educator's attitude towards technological changes in teaching and learning as well as weak ICT support were identified as other challenges facing higher education institutions in South Africa (Isabirye & Dlodlo, 2014). Additionally, changes in curricula and teaching methods brings big challenges to higher education in South Africa as uniform methods of teaching, learning and evaluation are becoming outdated. Hence, in this regard, there is a need for extensive restructuring of qualifications and programmes to equip students with the relevant knowledge, expertise and skills to meet the current economic changes (Badat, 2010)

The issue of diversity remains debatable also as it has both positive and negative effects in higher education. Because every student responds differently to the curriculum, lecturers need to constantly adjust their teaching and learning methods both in theory and practice (Lynch, 2016). Therefore, for a fair and equal treatment of students, lecturers are encouraged to recognise and accommodate these differences to promote harmony and understanding among everyone

Countable educational institutions have introduced the Tablet PC in their curriculum due to the affordances and abilities it offers. The Tablet PC is seen as a game changer featured with a manageable and good sized touchscreen, virtual keyboard and long battery life (Siemieniecki & Majeskwa, 2015; Hamon, 2012). The Tablet PC uses Android as it is a reliable and common operating system among others. Though there are criticisms made about the Tablet PC that it does not positively impact on students' learning outcomes (Nguyen et al., 2014), a comparison between the Tablet PC and other mobile devices such as laptops and smart phones revealed that the Tablet PC is the most useful and convenient device that can be used for educational purposes (Mohseni, 2014).

The Tablet PC is a facet of mobile learning with borderless restrictions that promotes access to study material anywhere at any time. Russell (2013) emphasised on the fact that the Tablet PC has shifted from being a "nice to have" to a "must have" mobile device as it provides easy access to information.

Previous studies widely explored the innovative uses of the Tablet PC as well as its merits and demerits in higher education settings particularly in developed countries. However, to date no research has been done on students' perceptions regarding the Tablet PC as a mobile learning device in South African graduate institutes. Given the fact that students are no longer restricted by the four walls of the classroom to get education, this study attempt to explore students' perceptions regarding the Tablet PC as a mobile learning device to enhance learning.

This article discusses a chapter phase of a research study that explored students' perceptions of the Tablet PC as a mobile learning device used at a graduate institute in the city of Tshwane in South Africa.

In view of the above, the present article aims to address a research study that was conducted to explore the perceptions that students hold of the Tablet PC as a mobile learning device used for learning purposes. The primary research objective of the research was to explore students' perceptions regarding the efficiency and contribution to learning of the Tablet PC as a mobile learning device in order to justify the adaptation of study material by students.

It is from the above outlined primary research objective that several research objectives were derived. These secondary objectives were as follows:

1. To explore the uses of the Tablet PC as a mobile learning device used by students to enhance learning at a graduate institute.
2. To empirically identify the advantages of using the Tablet PC as a mobile learning device used by students to access learning material.
3. To discover challenges facing students when using the Tablet PC as a mobile learning device at a graduate institute in Tshwane.
4. To determine the performance of the Tablet PC in terms of service quality as it is used by students for academic purposes.
5. To determine the pedagogical opportunities offered by the Tablet PC as a mobile learning device.
6. To determine if students' perceptions of the Tablet PC varies with age, gender and years of instruction.

The research contributes to the existing body of literature by addressing the gap that exists in studies concerning students' perceptions of the Tablet PC as a mobile learning device used in higher education institutions to enhance learning. Educational institutions are encouraged to recognise the efforts of this study and consider enrolling the Tablet PC to students for learning purposes. The Tablet PC has become evidently essential at this point in time where lockdown regulations are enforced. The Covid 19 pandemic has led to a complete economic shutdown of schools, educational institutions and businesses. Students and workers were required to stay home with all learning and work activities conducted online as a precaution to avoid the spread of the disease. The Tablet PC became a useful mobile learning device among other devices such as laptops and smartphones as it facilitated learning among students and learners who possessed it during the pandemic.

Customer perception is a marketing concept that refers to the customers' thoughts about a product brand or a company's services. It is a marketing concept that encompasses customers' impression, awareness and consciousness about an institution and its offering using their five senses thereby creating a meaningful picture of the product (Yadav & Jain, 2016).

In this highly competitive world, improving customer perception is one of the greatest weapons that can be used by many organisations to differentiate their products from those of competitors. Factors such as price of the product, company reputation, product quality, brand, advertising and product price mainly influences the perceptions of customers. Marketers and institutions are therefore encouraged to maintain product consistence in terms of performance, effective communicate via relevant media and always emotionally connect with their customers. Customer perception is becoming commonly used by many educational institutions as a Unique Selling Proposition (USP) as it helps to differentiate an institutional offering to those of competitors.

The customer perception process is based on the fact that consumers are bombarded with marketing messages, information or product campaigns every day in form of advertisements, special offers, in-store displays and many others all fighting for their attention (Roberts-Lombard and Parumasur, 2015:161). However, due to customer's limited mental capacity, processing these marketing messages imposes a huge load on their brains therefore they end up selecting marketing messages that only conform to their needs and ignore others (Gunther, Muller & Geyer, 2017).

The study recognises students as customers therefore the customer perception process will be discussed in the context of students and the Tablet PC.

#### *Stage 1: Exposure to stimuli*

In the beginning of every year prospective matric students who have passed their studies seek for a university/college of their choice to register for their study. Once the student has made a decision to enrol with the institution under study, the student is given a Tablet PC to use for academic purposes for the entire study period of the course. It is during this time that the perception process begins.

Exposure refers to the extent to which an individual takes cognisance of stimuli via his or her senses (Roberts-Lombard & Parumasur, 2017). During exposure, the sensory receptors of a customer are engaged by product cues through sight, sound, smell, taste and texture (Cant, 2014:47). However, exposure to stimuli does not guarantee that the individual will pay attention to the information or marketing message though he or she may have seen or heard it (Roberts-Lombard and Parumasur, 2015:163).

In the study, students become exposed to the Tablet PC immediately it is handed to them to use for academic purposes.

#### *Stage 2: Attention to stimuli*

Attention occurs when an individual voluntarily attend to the stimuli that is consistent with his or her current needs (Stuart, 2014). Attention can be defined as "... the extent to which the processing activity is devoted to a particular stimulus" (Roberts-Lombard & Parumasur, 2017:151). According to

Solomon et al., (2012: 155) attention is "... the extent to which a person devotes mental processing to a particular stimulus".

In the study, after being exposed to the Tablet PC, students will therefore choose to pay attention to information or instructions that help them navigate when using the Tablet PC in their studies. During the attention stage, students pay more attention to the main functionalities of the Tablet PC and try to understand how various features work.

#### *Stage 3: Interpretation*

Interpretation refers to the meaning that a person assigns to sensory stimuli (Cant & Van Heerden, 2018:63). During this stage, the customer comprehends, decodes and assigns meaning to the marketing message (Stuart, 2014:156). In interpreting the stimuli, the customer can be lowly or highly involved.

In the study, students try to assign meaning and make sense of the Tablet PC functionalities as they use it to perform various academic purposes.

#### *Stage 4: Memory/Recall*

Storage or memory is the last stage of the customer perception process where information is retained in the customer's memory so that it will be available when the customer is considering buying the product (Roberts-Lombard & Parumasur, 2017:154). During this stage very few individuals, if any, will remember everything they experienced even after attaching meaning and interpreting it. This is based on the fact that customers tend to forget the marketing message when they are making a product purchase through selective retention even if they had perceived the message correctly.

Storage or memory stage is marked by the ability of the student to remember the information they have paid attention to when using the Tablet PC. This information will therefore be used to make future decisions pertaining to the Tablet PC usage.

As shown in Figure 1, the four stages of customer perception lead to decision making. It is through customer perception that a customer decides to purchase a product and be loyal to the brand in future. If a product is fairly and equitably perceived by a customer, satisfaction is absolutely guaranteed. According to Deloitte reports, customer perception impacts the customer's decision-making and is a huge success factor in many organisations and institutions.

## **RESEARCH METHODS**

In order to explore the students' perceptions of the Tablet PC as a mobile learning device, a quantitative research approach was adopted. Data was collected from undergraduate students through a web-based online survey using a semi-structured questionnaire. Non-probability sampling method in the form of convenience sampling was used to select participants. Responses from participants were captured through Limesurvey, exported to excel and analysed using SPSS 24.

The study emanated from the fact that students are provided with the Tablet Personal Computer (PC) as a mobile learning device to use for learning purposes. The Tablet PC is given to the student immediately after registering to study with the institution under study. The aim is to explore students' perceptions regarding the efficiency and contribution to learning of the Tablet PC as a mobile learning device.

### **Research approach and design**

A quantitative research approach was used in the research and the study was empirical in nature. An exploratory research design was used to gather individual student perceptions regarding the Tablet PC.

### **Data sources**

Secondary data was obtained through literature review of published sources, dissertations, and existing published journals. Primary data was gathered from participants through a self-administered web-based online survey using a semi-structured questionnaire.

### **Sampling**

The sample for this study was drawn from a target population of 277 respondents using non-probability sampling method in the form of convenience sampling. Data from the web-based survey was electronically captured through Limesurvey and automatically exported to Microsoft Excel 2016 spread sheet and then exported into SPSS 24 for analysis.

### **Data analysis**

Descriptive statistics was computed for the demographic factors and all the scale items in the questionnaire and presented in the form of frequencies, means, standard deviations, distribution and coefficients of variation for numerical data.

Data from the online survey was analysed using frequency distribution in the form of tables, figures, distribution, means and standard deviations for each survey question. This was followed by factor analysis, independent t-test and Analysis of Variance (ANOVA).

Distribution analysis was performed to indicate the distribution of survey data responses from the online survey. Normal distribution is described by reporting the mean which shows the centre is located and the standard deviation which shows the spread of data from the mean.

Exploratory Factor Analysis (EFA) was performed to determine the items that were highly correlated so that they will be able to form constructs that can be used in comparative analysis. EFA was conducted using principle component analysis with varimax rotation.

An Independent t-test was performed to determine whether there was a statistically significant difference between the means of two categories or groups which are independent of each other. The overall purpose of conducting an independent t-test in this research was to explore the respondents' perceptions of the Tablet PC between two independent groups such as male

and female respondents.

Analysis of Variance (ANOVA) was also performed in this research to determine the difference across constructs with more than two categories. The purpose of conducting ANOVA was to determine the respondents' perceptions of the Tablet PC by year of study.

Correlation analysis was performed to measure the strength or direction of a relationship between two or more variables namely the Tablet PC variables. Lastly, regression analysis was performed to determine the relationship between a set of independent variables and a dependent variable namely the relationship between the Tablet PC challenges and the other research variables.

## FINDINGS AND DISCUSSION

The results of the empirical research focussed on demographic profile, reliability and responses from questionnaire constructs.

### Demographic profile

An analysis of the demographic profile of the respondents is visually presented in table 1, below.

**Table 1 Characteristics of the respondents**

Variable	Category	Count	%
Gender	Male	69	40.8%
	Female	100	59.2%
	<b>Total</b>	<b>169</b>	<b>100 .0%</b>
Age	18 - 30 years	164	97.0%
	31 - 40 years	5	3.0%
	<b>Total</b>	<b>169</b>	<b>100 .0%</b>
Year of study	1 <sup>st</sup> year	59	34.9%
	2 <sup>nd</sup> year	52	30.8%
	3 <sup>rd</sup> year	58	34.3%
	<b>Total</b>	<b>169</b>	<b>100 .0%</b>

As indicated in Table 1, in terms of gender, the majority (59.2%; n=100) of respondents were females and a total of 69 or 40,8% of respondents were males. These numbers are in line with the registration statistics of the institution where most students are females compared to males. In terms of age, the majority (97%; n=164) of respondents who answered the questionnaire ranged between 18 - 30 years of age while 3% or five (5) respondents were in the age group of 31- 40 years. In terms of study level, it is clear from Table 1 that there was an even distribution among 1st year (34.9%; n=59), 2nd year (30.8%; n=52) and 3rd year (34.3%; n=58) respondents. Thus, there was no significant difference between the three levels of study in terms of number of respondents meaning that respondents were evenly distributed among the study groups.

Internal consistency in this research was assessed by Cronbach's Alpha ( $\alpha$ ) using the guidelines by (Manerikar & Manerikar, 2015). These guidelines provided a rule of thumb which says that if Cronbach's alpha is  $\geq .9$  then its

Excellent, if  $\geq .7$  means Good, if  $\geq .6$  is acceptable, if  $\geq .5$  Poor and if  $\alpha < .5$  its unacceptable. A high coefficient for Cronbach's alpha is always ideal as it indicate that the scale items are strongly related and therefore measuring the same construct. The reliability calculated for each variable and the overall instrument are shown in Table 2.

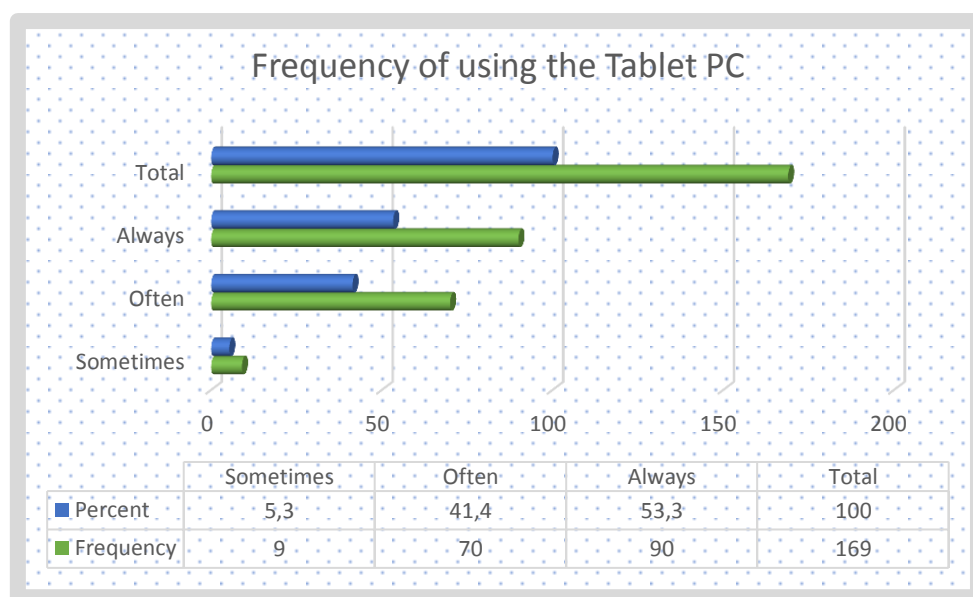
**Table 2: Internal Consistency- Cronbach's alpha**

Variable	No. of items	Cronbach's alpha	Acceptable level
Uses of the Tablet PC	18	.636	Acceptable
Advantages of the Tablet PC	17	.606	Acceptable
Challenges of the Tablet PC	15	.794	Good
Tablet PC technical aspects	19	.863	Good
Pedagogical opportunities offered by the Tablet PC	14	.920	Excellent
<b>Total</b>	<b>83</b>	<b>.833</b>	<b>Good</b>

Of the 169 respondents who completed the survey, 59.2% or 100 respondents were female and 40.8% or 69 were male. Most respondents (97%; n=164) were between the ages of 18 and 30 and a small percentage (3%; n=5) were between the age of 31 and 40. In terms of years of instruction, there was no significant difference between all the respondents. The highest number of respondents were 1st years with 34.9% (n=59) followed by 3rd year students with 34.3% (n=58) and lastly 2nd years with 30.8% (n=52).

### Frequency of using the Tablet PC

Respondents were requested to indicate the frequency of use. The results are illustrated in Figure 1 below.



**Figure 1: Frequency of using the tablet (n=169)**

As illustrated in Figure 1, more than half of the respondents (53.3%; n=90) reported to always use the Tablet PC while 41.4% (n=70) of respondents often make use of the Tablet PC for their studies. A total of nine (9) respondents (53%) indicated that they sometimes use the Tablet PC for study purposes.

### **Uses of the Tablet PC as a mobile learning device**

The findings indicated that the majority of respondents (53.3% or 90) always and 41.4% or 70 often use the Tablet PC for their studies. Only a few of the respondents (5.3% or 9) indicated that they sometimes use the Tablet PC for study purposes. These results would seem to indicate that the Tablet PC is mainly used by students for academic purposes.

More than 95% of the respondents (95.24% or 160) always or often use the Tablet PC to access study guides, 94.65% or 159 study for online exams on the Tablet PC and 92.31% or 156 respondents conduct research on coursework. In terms of assignment submission on, more than 90% of the respondents (92.85% or 155) never or rarely did so using the Tablet PC. It was also found that more than 40% of the respondents (40.61% or 167) sometimes use the Tablet PC to download and read e-books. Previous studies conducted by (Duran & Aytac, 2016; Percival & Claydon, 2015; Shambare & Shambare, 2016; Siemieniecki & Majewska, 2015) confirm several uses of the Tablet PC as revealed in the current research results. Therefore, it can be concluded that the first secondary research objective was achieved as the Tablet PC was confirmed to be used by most students for various purposes to enhance learning.

### **Advantages of using the Tablet PC**

The advantages of the Tablet PC were measured and (98.80% or 165) of the respondents strongly agree and agree that the Tablet PC is light weight making it easy to move from one class to the other, (98.23% or 165) of the respondents indicated that the Tablet PC has a good screen size which displays learning material in a visible manner, (97.63% or 165) enables to do research at the campus and at home, gives the flexibility to work at own pace, (97.05% or 164) provides easy access study material on and off campus, 97.63% or 165 enables them to do research at the campus and at home, (97.63 or 165) gives the flexibility to work at own pace, (97.05 or 164) provides easy access to study material on and off the campus. The research results further indicated that more than 70% of the respondents (73.37% or 124) strongly agree or disagree that the Tablet PC easily access examination results online. More than 8% of the respondents (8.93% or 15) were neutral that the Tablet PC enables them to enable respondent to be more creative in solving course work problems, (8.33% or 14) has a long battery life which allows respondents to accomplish daily class work and (8.28% or 14) allows respondents to communicate online with peers and lecturers regarding academic matters. Results from the studies conducted by several researchers (Alyahya & Gall, 2012; Mang & Wardley, 2012; Percival & Claydon, 2015; Rossing, Miller, Cecil and Stamper, 2012; Siemieniecki & Majewska, 2015) confirms the advantages of using the Tablet PC as indicated in the current research results. It can therefore be concluded that the second secondary research objective was achieved because many respondents

indicated that they agree and strongly agree that the Tablet PC offers advantages that enables them to easily access learning material.

### **Challenges of using the Tablet PC**

Reporting on the challenges of Tablet PC it was found that more than 80% of the respondents (83.23% or 139) always or often find it difficult to work especially when drawing graphs and diagrams. It was further found that total of (68.64% or 116) respondents find it difficult to access examination results online using the Tablet PC. The results of the research found that more than 90% of the respondents (93.49% or 158) never or rarely find it difficult to download learning material, (92.91%) or log in to social sites to interact with others, 92.82% or 155) read learning material on the Tablet due to its screen size. Only a few of the respondents (7.1% or 12) indicated that they sometimes find it difficult to upload additional learning material. Literature results from studies conducted by (Duran & Aytac, 2016; Mang & Wardley, 2012; Shambare & Shambare, 2016; Siemieniecki & Majewska, 2015; Stewart, 2013) addressed the challenges faced by respondents in the study when using the Tablet PC. It can therefore be concluded that the secondary research objective was achieved as respondents were able to identify similar challenges they face when using the Tablet PC as a mobile learning device.

### **Tablet PC technical aspects**

More than 95% respondents (96.45% or 163) strongly agree or agree that the Tablet PC is compatible with other devices making it easy to share learning material with others, (95.86% or 162) indicated that the Tablet PC can easily install and uninstall applications and (95.26% or 161) strongly agree and agree that the Tablet PC is user friendly. The study further found that more than 20% of the respondents (21.89% or 37) strongly disagree or disagree that the Tablet PC has a long battery life. Additionally, more than 20% of the respondents (23.81% or 40) can effectively perform back up of learning material. Research results from studies conducted by (Clark & Luckin, 2013; Radosevich & Kahn, 2006) address some technical aspects of the Tablet PC. Hence, it can be concluded that the Tablet PC is an effective and efficient tool that performs beyond student expectation. Therefore, the fourth secondary research objective was achieved as many respondents agree or strongly agree to the Tablet PC performance in terms of service quality satisfaction.

### **Pedagogical opportunities offered by the Tablets PC**

Pedagogical opportunities offered by the Tablet PC, was investigated and the research found that more than 90% of the respondents (96.43% or 162) agree to a very large extent or to a large extent that the Tablet PC promotes independent learning, (94.64% or 159) strengthens my learning experience, (94.05% or 158) integrates knowledge and skills, (94.01% or 157) provide learning instructions of using it, (92.90% or 157) enhances collaboration with other students, (92.90% or 157) improves learning outcomes, (92.81% or 155) increase motivation towards learning, (92.26% or 155) facilitates active teaching and learning methods, (90.30% 238 or 149) supports low-performing students. The research further found that more than 10% of the respondents (10.06% or

17) agree to some extent that the Tablet PC support gifted students while more than 5% of the respondents (5.92% or 10) agree to a little extent or not to any extent about the same technical aspect. Previous studies conducted by (Bai, 2019; Clark, W & Luckin, 2013; Melhuish & Falloon, 2010; Rossing, Miller, Cecil and Stamper, 2012; Tront, 2015) address some of the pedagogical opportunities offered by the Tablet PC as indicated in the current research. Therefore, it can be concluded that the fifth secondary objective was achieved as the Tablet PC was found to offer pedagogical opportunities as a mobile learning device to a large and very large extent

## CONCLUSION

Customer perception defines everything about an organisation as it determines the success of a business. The perceptions that customers have about an institution's brand, its products or services and its values can have a serious impact on their interaction, purchase decision and consumption. In fact, fostering positive perceptions can help an institution to build a sustainable, loyal and a huge customer database. Personal experience is the key factor that influences how customers perceive a product. Therefore, improving customer perception is essential as it influences the experiences of customers. It is very important for institutions and organisations to note that if customers have a bad experience of the offered product they will quickly switch to competitors' products. Positive customer perception does not only increase sales but fosters long-term relationships, creates brand ambassadors, loyalty and builds trust relationships between customers and an institution. An institution need to make sure that customers' perceptions are influenced positively by offering emotional benefits and a positive shopping experience in every touch point of the institution. It can therefore be concluded that institutions need not make false claims or promises about their products, instead, they need to research more on their customer perceptions, react with compassion and take corrective action for a brighter future.

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