

A survey of the mutual effects of mobile phone usage on the citizenship culture in developing countries

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Abstract

Information and Communication Technologies have made great changes to the lifestyle of human beings. Mobile phones, with their rapid growth in different parts of the world, are essential parts of our lives. The mobile phone has helped to overcome location barriers and has had a great impact on people's lives, especially in urban areas. In developing countries, the mobile phone has grown rapidly in the recent decade and has had a great impact on communication and other aspects of social life. The purpose of this study is to investigate the effects of the mobile phone technology push on the culture of citizens, in developing countries. Through survey-type research, a sample of people in Tehran, the capital city of Iran, have been asked to fill out a questionnaire; then, after gathering and cleansing and analysing the data, some recommendations are added that could be used in urban policy-making in the various developing countries.

Keywords: Citizenship Culture, Mobile Phone, Citizen Education, Citizenship Culture Promotion

Introduction

Today, ICT has transformed the lives of human beings (Floridi, 2007). Mobile phones, and specifically smartphones, have had many impacts on urban life; for instance, on communication methods, traffic and businesses, especially in cities where residents enjoy a better network and Internet coverage (Townsend, 2000). The effect of ICT on culture should not be circumscribed to merely mobile phone, but to every technological system such as social media. The behaviour of citizens on social media after a major political event can be simply observed and studied (Fadillah & Jandevi, 2020). In this way, the mobile phone had some transformational effects on citizenship culture (Couldry et al., 2014). With the drastic growth of mobile networks and Internet coverage in the last decade in developing countries, these countries also face great changes in people's lifestyles

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and cultures; in fact, the expansion of ICT in developing countries has been so fast that these countries might need an adaptation phase (Aksal & Gazi, 2015) communication and technology (ICT). This study focuses on how mobile phone usage impacts the citizenship culture in developing countries.

In today’s world, information and communication technologies play an undoubtedly important role in human societies. Hence, the development of these technologies is at a high growth rate and the use of ICTs including the Internet and mobile phones is increasingly growing (Ovljak et al., 2015). Smartphones and tablets are among the most available means of modern technology. Moreover, smartphones let you have the advantages of Internet accessibility, flexibility, ubiquity and “always-on” connectivity in one gadget (Arpaci et al., 2015). Given the increasing popularity of mobile phones as the main means of communication, it is important to examine their positive and negative effects to utilize their capacity to enhance citizenship culture. Creating, expanding and deepening citizenship culture and social ethics could open many doors to developing countries in dealing with the urban and social issues they usually face (Rice & Sumberg, 1997).

Mobile phones have nowadays become an integral part of our daily lives (McGuigan, 2005). Individuals are attracted to ICTs like the Internet, mobile phones and fixed broadband connections to seek curiosity, creativity and diversity in their lives (Choden et al., 2019). Alongside the advances in science and technology, mobile services have developed, and the penetration coefficient of mobile phones has increased; this is a growing trend in the world and also in Iran. As is shown in Figure 1, there has been a remarkable growth in mobile phone registrations in comparison to the population, throughout the world (International Telecommunication Union (ITU), 2022).

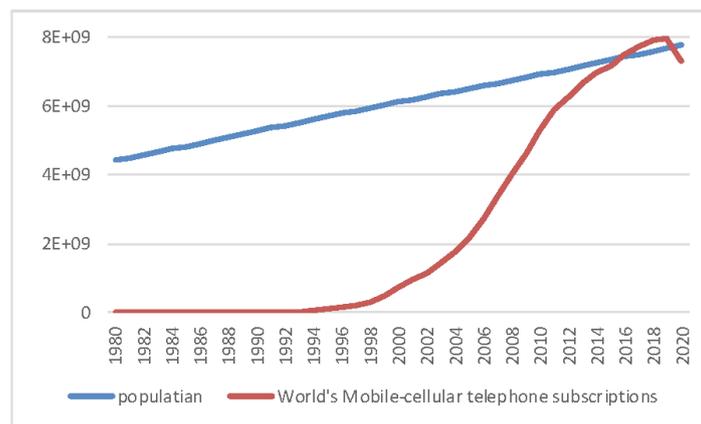


Figure 1: World’s Mobile-cellular telephone subscriptions (International Telecommunication Union (ITU), 2022).

In Iran, like other developing countries, the penetration coefficient of mobile phones and thus access to its services has increased. As illustrated in Figure 2, more than half of Iranians have access to the Internet (International Telecommunication Union (ITU), 2022).

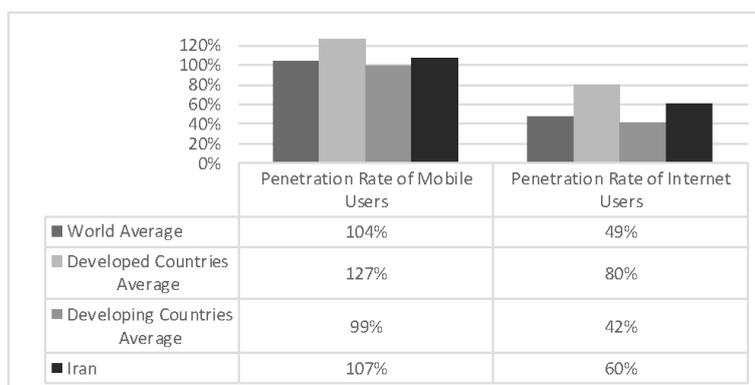


Figure 2: Comparison of mobile penetration rate in the world (International Telecommunication Union (ITU), 2022)

Citizenship is one of the important indicators of a nation's level of development, and, one of the important aspects of which is culture (Verba & Almond, 1963). Citizenship is not conceivable without regard to citizenship culture; citizenship culture has evolved alongside civil society and government (Manteghi & Dinparvar, 2012). The mutual effects of mobile phone utilization and civic culture is investigated with a systems approach, and key effective factors are suggested (Hosseini et al., 2022).

As the issue of globalization has become more serious in recent decades, this phenomenon is one of the most important contemporary social issues, since dealing with urban problems, urbanization crises and citizen behaviour reform require a proper civic and urban culture (Kim et al., 2016). Therefore, to improve the economic, social, and cultural status of cities, there must be regular planning to promote the citizenship culture. We could avoid many economic and social costs by enhancing the citizenship culture, and these resources could be spent in the right place to minimize existing problems. In this regard, it is important to pay attention to modern technologies to improve citizenship culture.

In this research, we used a survey method, and the data were collected using a questionnaire from a sample of 394 citizens of Tehran, the capital city of Iran, within the age range of 15 to 75 years old. Then the data was analysed and the dimensions and the extent of influence of the factors affecting the status of citizenship culture are investigated with an emphasis on the contexts and potentials of the smartphones in urban areas. The importance of doing this kind of research in developing countries is that in such countries communication technology growth rates are very high; therefore, the cultural infrastructure of the society is not fully shaped to make adaptations to the new-coming technology.

This paper is organized as follows: In the next section, the research background, research methodology and the analysis method are explained. It should be noted that the factors and variables used in the design of the questionnaire were identified and extracted from the previous literature. In the third section, the findings of the questionnaire are analysed in two parts: univariate analysis and bivariate analysis. The fourth section is a discussion in which some policy recommendations are briefly presented. These recommendations can be used by citizenship culture strategists and policymakers. In the end, research novelties and future research recommendations are presented.

Literature Review

The interaction between ICT and society has been at the centre of attention since the 2000s (Bradley, 2006). Among them, several studies concern the potential of mobile phones to make contributions to programs the aim of which is to boost the citizenship culture. Studies show that using mobile phones could motivate citizens to engage in civic and social matters (Lee & Park, 2018; Pertierra, 2005). Moreover, it is shown that there is a strong positive relationship between the intensity of smartphone use and bonding social capital (Pang, 2017). The impact of education on citizenship culture is considered to be an important factor in urban management (Tabatabaei, 2014). (KhajeNoori & Kaveh, 2013) examined the impact of mass media, including mobile phones, on the sense of social security in urban society. Another study by (Chiu et al., 2015), explores the impact of online services on citizen behaviour and the role of governance in this area.

(Kord & Orei-Yazdani, 2013), identified the factors affecting the development of e-government and made suggestions that illustrate the importance of developing electronic infrastructure. In another study, (OMIDI & Enshiyeh, 2009) examined the challenges and opportunities of using mobile phones in training farmers and crop producers. (Tabatabaei, 2014) pointed out the role of government in the development of distance education on the mobile platform. (Kim et al., 2016) examined the impact of mobile tourism services on attracting tourists and the role of government in providing such services. (Royston et al., 2015) summarize previous research and represent strategies for mobile health care for individuals and then analyse their implementation effects.

In their article, (Manteghi & Dinparvar, 2012), examine the process of creation and deepening of hidden and informal identities in student mobile and Internet users as well as the effect of mobile phones on their education. (Navabakhsh et al., 2010) investigated the effects of the Internet and mobile on the youth and their

identity changes in urban society. Finally, using a systems approach, (Saleck Pay et al., 2013), investigated the dynamics that resulted in social media network use among Iranian students.

Although citizenship culture has been discussed in all the above-mentioned literature, no research has been conducted on the impact of new communication technologies such as mobile phones on citizenship culture.

Methods

This research is based on survey-type fieldwork. Surveying is a method of obtaining information about the views, beliefs, opinions, behaviour, motivations or characteristics of a group of people, who are members of a community. This statistical method is based on scientific research methodology (Edwards et al., 1997). Surveying is considered a scientific method in social research, defined as a standardized method of gathering information about individuals, families, or larger groups in a society. In fact, surveying can be seen as both a tool as well as a process of data gathering in a society.

Surveying is one of the methods through which one can describe variables and also examine and analyse the relationships among those variables (Karimi & Mozafari, 2015). Therefore, the present study uses the surveying method and questionnaire technique to collect data and then analyses the collected data.

In this study, the level of observation is individual. The population of the study is a group of 15 to 75-year-old residents of Tehran, the capital city of Iran. The sampling method in this research is multi-stage sampling. To choose a fair sample, we chose three different regions from Tehran, which represent high, moderate and low socioeconomic levels of the community. Then, according to the population of each region, which was obtained from the (*National Statistical Portal*, 2011) based on the national census of 2011, a proportionate number of questionnaires was distributed through the regions.

Finally, 394 questionnaires were distributed. In order to complete the questionnaires, individuals were selected randomly in the regions and completed the questionnaires. According to the Cochran formula, the sample size has to be at least 384, regarding the population of 12.5 million in Tehran; therefore, 394 questionnaires were collected in this study.

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left(\frac{z^2 pq}{d^2} - 1 \right)} \tag{1}$$

In this study, after determining the statistical sample, the initial questionnaire was designed and then reviewed. After making changes according to experts' comments and getting the questionnaire approved, validity and reliability were measured. A valid measure measures what is desired to be measured (De Vaus, 2013). According to this definition, to measure the validity of the measurement tool, we used nominal validity obtained by referring to the opinions of the experts. Cronbach's alpha coefficient was used to assess the reliability of the questionnaire. The coefficient is calculated as 0.8, thus, considering that it is higher than 0.7, the reliability of this questionnaire is considered appropriate.

Table 1: Required Number of Respondents

No. of Items	Cronbach's Alpha
90	0.804

According to the literature, to measure the effect of mobile phones on the citizenship culture, we can consider the following dimensions:

- The mutual effects of mobile phone usage and
- Social communications of the citizens
- Personal lives of the citizens
- Electronic services used by the citizens

- Raising the awareness of the citizens
- The status of education of the citizens

To design the questionnaire, we certainly need some unequivocal variables to work with. We derived several variables from the literature, based on which we designed the questionnaire. After that, we went ahead with the survey and after analysing the results, we found the importance of the variables. More importantly, we discovered the dynamics of the relationships between variables.

Table 2: Respondents by Gender

Gender	Frequency	Percentage
Female	223	56.5%
Male	171	43.4%
Total	394	100%

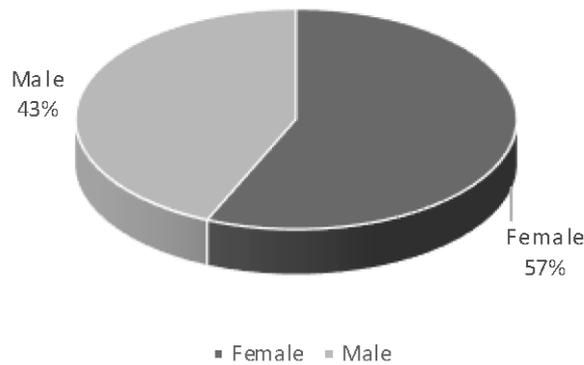


Figure 3: Respondents by Gender

Table 3: Respondents' Level of Education

Level of Education	Frequency	Percentage
Illiterate	20	5.1
Primary School	0	0
Middle & High School	8	2
High School Diploma & Associate Degree	86	21.9
Bachelor's Degree	172	43.7
Master's Degree and PhD	108	27.4

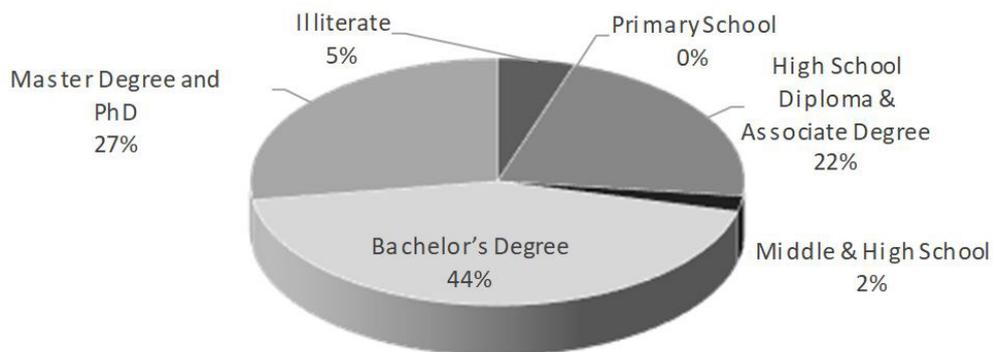


Figure 4: Respondents' Level of Education.

Analysis of univariate variables

In this section, two of the most important factors are presented in detail; then, a summary of the research findings is represented for the ten most important factors.

The statistical description of “Mobile phone and face-to-face communication”

This item shows the in-person and face-to-face communications as a result of using mobile phones among respondents. The questionnaire results are mostly “Low” and “Very Low”. The results are presented in Table 4 and Figure 5. A standard deviation of 0.8 indicates a high consensus among the respondent over the results.

Unfortunately, the excessive usage of mobile phones has resulted in the displacement of cyberspace instead of reality. High availability and the abundance of channels have made virtual communication means a replacement for real and face-to-face communication. This has even resulted in diminishing communication capabilities, especially among teenagers and young people.

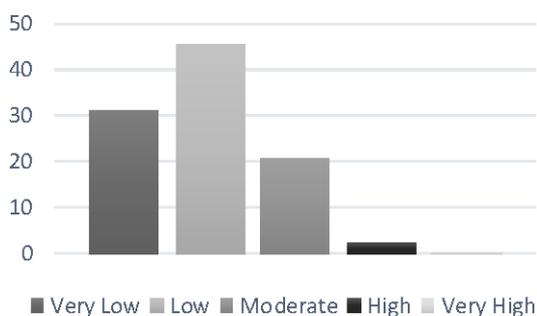


Figure 5: Statistics for Face-to-face Communication.

The statistical description of “Respect others’ privacy”

This item shows the level of respect for others’ privacy that citizens maintain while using mobile phones. With 373 respondents, the highest number (37.9%) of responses were “High” and the lowest number of responses (2%) were “Very Low”. Other statistics are presented in Table 4 and Figure 6. An average of 3.7 indicates that the overall results are upper medium. A standard deviation of 0.8 indicates a high consensus among the respondent over the results.

According to the results, most of the respondents respect others’ privacy, while using mobile phones. However, the reality shows that it is not always true. The photos and video clips that show accidents, fights and other private scenes are mostly recorded by citizens’ mobile phones and are spread all over the social networks. It means that although such privacy invasion actions are unacceptable to the public, this creed is not so deeply rooted to make changes to their behaviour.

Table 4: Statistics for Respect Others’ Privacy

Respect Other’s Privacy	Number of Responses	Levels					Statistics		
		Very Low	Low	Medium	High	Very High	Mean	Medium	Standard Deviation
	373	2	4.7	30.1	37.9	19.9	3.7	4	0.8

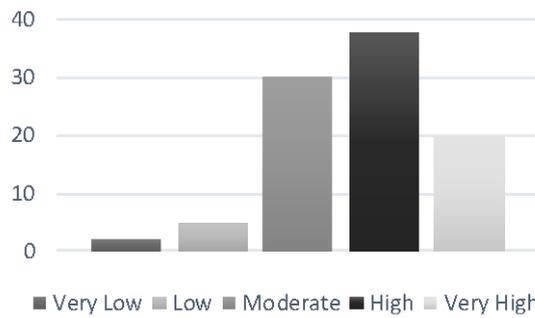


Figure 6: Statistics for Respect Others' Privacy.

Univariate Analysis of Ten Key Variables

There are several variables in the questionnaire. To avoid the prolongation of the word, we do not go on with the statistical description of every variable and present a summary of the results. Among the questionnaire's results, ten variables have the highest correlation and the least standard deviation. These ten variables are enlisted and briefly described in Table 5.

Table 5: Univariate Analysis of Ten Key Variables.

Variable	Description
1 Mobile phone and face-to-face communication	This variable measures the number of communication people have in person, and the results with a comparatively "high" correlation show that more people are less likely to visit friends and acquaintances; instead, they would rather communicate by phone, send texts, and use messaging applications, and social networks.
2 Respect others' privacy on mobile platform	This variable measures the level of respect for the privacy of others on the mobile platform. According to the results, most people have "high" respect for other people's privacy on the mobile platform.
3 Teaching moral principles in the cyberspace	This variable measures how much people teach others about ethnic principles in cyberspace. The results of the studies show that most of the statistical sample is less likely to teach these issues to others.
4 Education on mobile platform	This variable measures the extent to which the community utilizes the mobile phone's educational potential. According to the results, the sample community moderately utilizes these potentials.
5 Mobile phones and the personal lives of citizens	This variable measures the overall impact of mobile phones on different aspects of citizens' personal lives by studying their social communication, dissemination of personal information in cyberspace, access and speed of mobile Internet, giving and accepting criticism in cyberspace, etc. According to the results, most responses point to the "average" mobile presence in the individual lives of citizens.
6 Mobile phone and social communication	This variable measures the impact of mobile phones on social communication such as the degree of social isolation, the degree of instability of social communication resulting from mobile phone usage, the degree of anxiety, loneliness, and so on. The results show that with high consensus, the statistical population declared the effect of mobile phones on social communication to be "moderate".

7	Parental awareness of the dangers and benefits of mobile phone	This variable measures the level of parental awareness of the dangers and benefits of mobile phones. According to the results, the level of awareness is "high».
8	Mobile phone and emotional connection of the families with the students	This variable measures the relationship between mobile phone usage among students and the degree of family emotional connection with them. According to the statistical community, the level of this relationship is "moderate to low".
9	Mobile phones and instability of social values	This variable measures the extent to which social and national values become unstable, as a result of the presence of cyberspace. According to the results, the level of instability of social values is at the "average" level.
10	Mobile phone and publishing personal information on virtual networks	This variable measures the level of agreement on the prevention of the dissemination of personal information in virtual networks. According to the results, a large part of the statistical community believes that this should be observed and that personal information should not be disseminated in virtual networks.

Table 6: Correlations of the variables

Intensity	Variables	Correlation
Strong Positive	<ul style="list-style-type: none"> • Respect for the Law • Citizenship Culture 	An increase in the level of respect for the law will lead to a significant improvement in the citizenship culture.
	<ul style="list-style-type: none"> • Mobile Electronic Services • Citizenship Education via Mobile Phone 	The development of electronic services on the mobile platform will significantly contribute to education through this communication tool.
	<ul style="list-style-type: none"> • Respect Other's Privacy • Citizenship Culture 	Protecting the privacy and preventing private issues from being disseminated on virtual networks will significantly enhance the level of citizenship culture.
	<ul style="list-style-type: none"> • Citizenship Behavior • Citizenship Culture 	Regard for citizenship behavior such as the rights of the pedestrian, refraining from throwing junk on the street, preventing water loss in parks and urban green spaces, etc. will enhance the level of citizenship culture.
Moderate Positive	<ul style="list-style-type: none"> • Mobile Educational Services • Use of Mobile Urban Services 	Expanding the use of educational services on the mobile platform will increase the use of mobile urban services in society.
	<ul style="list-style-type: none"> • Mobile Electronic Services • Citizenship Culture 	Increasing the delivery of mobile e-services will improve citizens' compliance with urban values and norms.
	<ul style="list-style-type: none"> • Level of Education • Social Communication 	Level of education has a moderate positive effect on the level of social communication.

	<ul style="list-style-type: none"> • Instability of Social Values Instability of social values reduces the level of citizenship culture. • Citizenship Culture
Negative	<ul style="list-style-type: none"> • Time on Mobile Phone Making changes to lifestyle in order to spend more time with mobile phones reduce the level of citizenship culture in society. • Citizenship Culture • Individualism The increasing use of mobile phones causes loneliness and individualism, and, it the lowers the level of citizenship culture. • Citizenship Culture

Figure 7 presents a schematic representation of the relationships between the ten key variables.

Strong Positive Relationship ↔
 Moderate Positive Relationship ⇄
 Negative Relationship ←...→

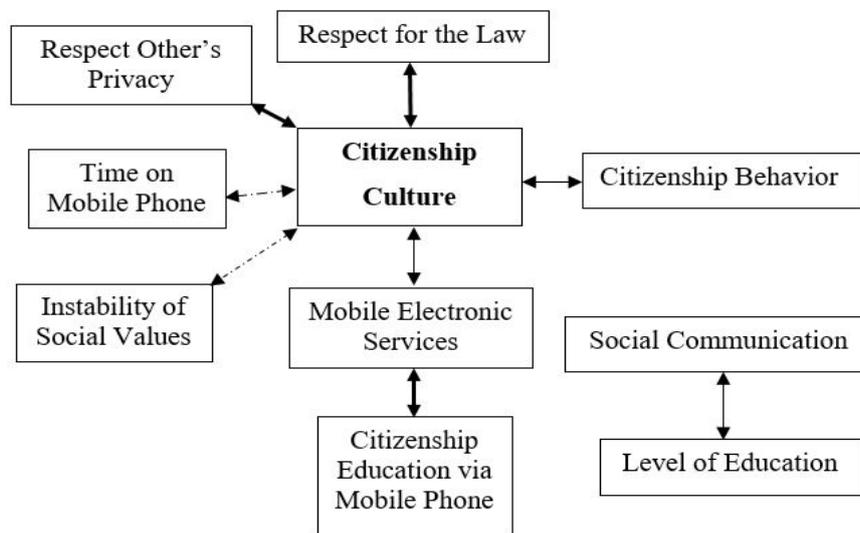


Figure 7: Relationships between Variables.

Discussion

About 60% of the statistical sample were women and 40% were men. The results show that around a third of the respondents, respect the citizenship culture at a moderate level. We have broken the relationship between mobile phones and citizenship culture into several variables.

According to the results, among these variables, mobile phones and personal lives of citizens, mobile phones and social communication, mobile phone and education are at a moderate level. It was concluded that there is a direct relationship between citizenship education and citizenship behaviour, so it is suggested to focus on citizenship education in both formal (schools and universities) and public (event holding) forms. There is also a moderate, direct relationship between the use of e-services and citizenship behaviours; hence, it is suggested that knowledge-based companies especially in the private sector, be supported in the field of providing e-services on the mobile platform.

There is a moderate inverse relationship between the lack of awareness and the utilizing the benefits of mobile phones in the promotion of citizenship. There is a strong direct relationship between Respect for the Law and the promotion of citizenship culture. There is also an inverse relationship between the instability of social values and the citizenship culture. That is to say, the more instable the social values in a society, the lower the

level of the citizenship culture.

There is a relatively strong direct relationship between mobile electronic services and citizenship education through mobile. There is also a good direct relationship between respect for others' privacy and citizenship culture; in other words, respecting the privacy of others will also enhance citizenship culture. Finally, there is a direct and moderate relationship between lack of citizenship awareness and citizenship education via mobile phones. In other words, the less the citizens' awareness of urban issues, the more citizenship education must increase.

In this section, we want to extend the outcomes of this research to a more pragmatic level. The policy recommendations that are presented here, could be used by urban or cultural strategists and policymakers, especially in developing countries.

As mentioned earlier, many of the shortcomings of citizenship culture could be fixed by facilitating citizen education. On the other hand, there are several topics other than citizen education that could fall under the category of citizenship culture promotional content; a very good example of which is sending notifications for festivals and other cultural events. Hence, improving the citizens' access to the citizenship culture promotional content could be a proper macro strategy that could be executed in many ways and through many channels. One of these channels is the mobile phone. For this purpose, the cultural content could be promoted on social networks and other media like mass SMS services.

City-wide Wi-Fi could be used to transfer the citizenship culture promotional content to the citizens' mobile phones. In fact, many developed countries already use city-wide Wi-Fi solutions. These facilities could be provided free of charge by municipalities in high-traffic areas, urban public transportation vehicles, parks and other crowded places. Free Internet could open doors to promote citizenship cultural content.

Besides, there are many ideas to create citizenship culture promotional content. Many stakeholders could help to create proper content; for instance, the education system could help by including citizenship culture promotional content in educational content, in a way that students are taught to make the best use of citizenship content or they are taught to take part in urban occasions promoted on their mobile phones.

Supporting the development of mobile applications for urban services could be a useful strategy. There are so many applications that could help citizens in their daily lives. For instance, navigation services are very important in helping citizens find the best routes, resulting in lighter traffic. Supporting the development of these types of applications in the form of programming contests or startups could abet the private sector to collaborate in creating the content. To give another example, mobile applications could be developed to help waste management; for example, by showing the arrival time of the garbage trucks.

A very large category of mobile phone usage in relation to the cities is the use of mobile phones along with other ICT technologies in supporting the sustainable development and management of cities (Kramers et al., 2014). As some good examples of the case, we can refer to home delivery services, payment services, ticketing and booking services and online conferences that all corroborate the sustainability of cities by lightening the traffic, consuming less fuel and consequently producing less air and environmental pollutants.

Conclusion

As a result of the high growth rate of communication technology in developing countries, people are not socially and culturally acclimatized to wanton exposure to this technology. This paper considers the influence of communication technology (in this article mobile phones) on citizenship culture. To improve this research, it is suggested that the questionnaire items and the analysis of the research results be reviewed for each region of the city separately, to study the results in each region according to the specific culture of the region and obtain a more accurate assessment. It is also suggested that the study be conducted in cities other than our case study to investigate the impact of ethnicities on this issue.

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