



Research Article

## Influence of Using Smartphones in the Teaching-learning Process of Systems Engineering's Students in the National University of Trujillo

Alberto Mendoza De los Santos\*

*Systems Engineering's Department, Universidad Nacional de Trujillo, Trujillo, Perú*

### Keywords

University,  
Smartphones,  
University students.

### Abstract

Smartphones are very popular with young people, especially with university students. Actually, they take full advantage of the gadget, mainly in their communicative, entertainment and educational functionalities; these are, aspects of the social and educational field. Then, students from the School of Systems Engineering of the National University of Trujillo are not the exception. In fact, smartphones are currently one of the personal devices most used in their activities. In that way, the aim of this study was to determine the influence of using Smartphones in the teaching-learning process of the Systems Engineering's students in the National University of Trujillo. To fulfill the objective, the literature related was reviewed, a questionnaire was developed and process to collect data related to the use of the Smartphones in Systems Engineering's students, and finally statistical tests were carried out to be able to affirm that there is influence of using Smartphones in the teaching-learning process.

### 1. Introduction

A smartphone is a device that has more capacity to process information and more connectivity than a conventional mobile [1]. Besides, it has more applications than its former version and they cover a lot of necessities and aspects of human life. For example, there are many mobile applications (APP) related to education, but the ones which have the spot are related to languages [2].

By the beginning, mobiles were for communication and entertainment. Nowadays, different functions were added which involve many aspects of people's life. Because of smartphones and mobile apps, that was possible. Actually, Smartphones became very popular with young university students, who take full advantage of their communicative, entertainment and educational functions, which are related to social and educational fields. Then, students from the School of Systems Engineering of the National University of Trujillo were not the exception. In fact, smartphones are currently one of the personal devices most used in their activities. That is why we ask how using smartphones affects

the teaching-learning process of Systems Engineering's students in the National University of Trujillo. To answer this question, it was set the following objective: To determine the influence of using Smartphones in the teaching-learning process of the Systems Engineering's students in the National University of Trujillo. The data was collected in the 2019-2 semester. It was thought that educational strategies could be improved by using these devices.

### 2. Literature Review

#### 2.1. University

Corporation that involves four main actors: professors, students, administrators (workers) and authorities. It has different goals like to support researches and social assistance as well to create goods and services that benefit the society. However, the most important is its academic aim: train qualified professionals who help the world to be better [3].

\* Corresponding Author: Alberto Mendoza De los Santos  
E-mail address: [amendozad@unitru.edu.pe](mailto:amendozad@unitru.edu.pe)

Received: 12 September 2020; Revised: 19 October 2020; Accepted: 21 October 2020

Please cite this article as: Alberto Mendoza De los Santos, Influence of Using Smartphones in the Teaching-learning Process of Systems Engineering's Students in the National University of Trujillo, Computational Research Progress in Applied Science & Engineering, CRPASE: Transactions of Electrical, Electronic and Computer Engineering 6 (2020) 228–231.

## 2.2. Smartphone

Hand-held device that is, as its name says, “intelligent”. The label is because it has technic and interesting capacities which increased its popularity. For example, it is very short, it is personal and it has a great connectivity that let people be online at any time or place. It has a huge pedagogical potential; however, it is necessary to develop more researches to insert it correctly into the educational process in universities [1].

## 2.3. Mobile learning

Use of mobile technology (alone or merged with another kind of technology like TICs) to make an easier learning at any time or place. It could be done in different ways; for example, some people use it to get some pedagogical resources, to be in touch with their pairs or to create contents inside or outside school [4].

## 3. The Findings

### 3.1. Literature Review

The most popular mobile device is the Smartphone, which symbolize the mobile internet revolution. Even if technology and new ways of communication are a reality to consider, they are still a challenge in the educational field [5].

The research of Salcines Talledo & Gonzales Fernández was focused on detecting the importance of Smartphones as a useful tool in teaching-learning and evaluation process for professors and students. Also, it caught the benefits and difficulties of involving the device in these process for professors and students. Results show that even the low pedagogical implementation of smartphones, professors and students felt more advantages than difficulties in their classrooms. Then, smartphones have a great pedagogical potential. Notwithstanding, it is important to reaffirm that it is still necessary more researching to insert it correctly in the educational process.

The main educational uses of smartphones are to communicate, to get information and to organize [1]. These researchers explore the coverage and educational use of mobiles of students and professors in Universidad Autónoma de Baja California. To do that, they picked up an aleatory sample of 12 % students and 24 % professors of the university. They also asked the sample about smartphones: if they had them, what were their specifications, what were the educational uses of them and the advantages and disadvantages of their use in university courses. The researchers found that close to 97 % of the sample (students and professors) had smartphones. Regarding to the disadvantages, they identified that it could be a distraction and it had a high cost of connection. Regarding to the advantages, there were mentioned the possibility to communicate with others and the access to important information at any time or place.

### 3.2. Building the Data Gathering Instruments

As a data gathering instrument, it was developed and distributed a questionnaire to a selected sample. The

questions ask for information related to features, service and application use frequency and other issues related to smartphones

### 3.3. Applying Data Gathering Instruments to System Engineering Students

After applying the data gathering instruments, the following results were found.

- a) Socio-Demographic análisis: By this information, the peculiarities of the system engineering students selected were described.

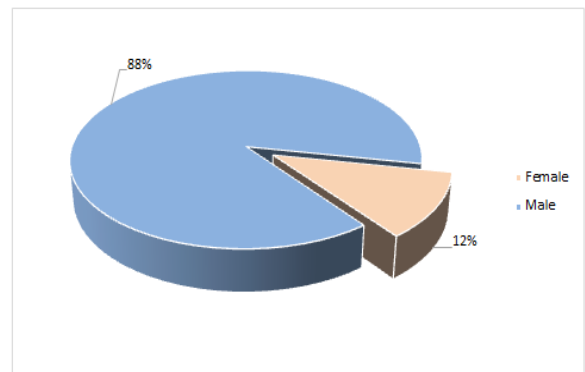


Figure 1. Systems engineering students in National University of Trujillo by gender

It could be said that there is a majority of male students (88%) in contrast to a minority of female scholars (12%).

- b) Use of mobile análisis: Some features of systems engineering students’ mobile devices were checked. One of them, was the Brand; apparently the favorite ones would be Huawei (35%) and Samsung (32%). The brands less mentioned were Apple (3%), Nokia (3%) and “others” (1%).

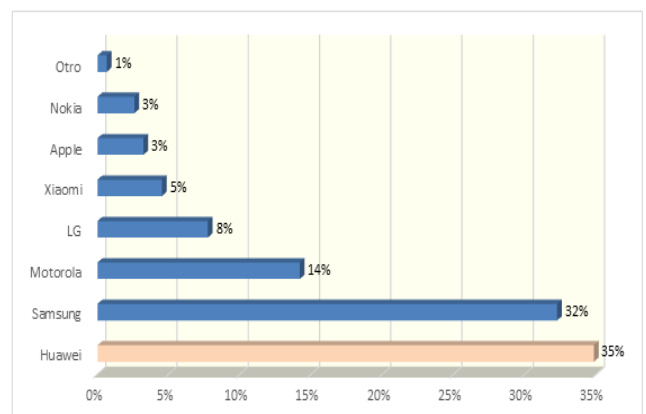


Figure 2. Mobile brands used by systems engineering students in National University of Trujillo

Regarding to the connectivity, 50% of them said that having internet every day is not a problem. A 48% depends on the WIFI internet connection and a 2% does not have internet.

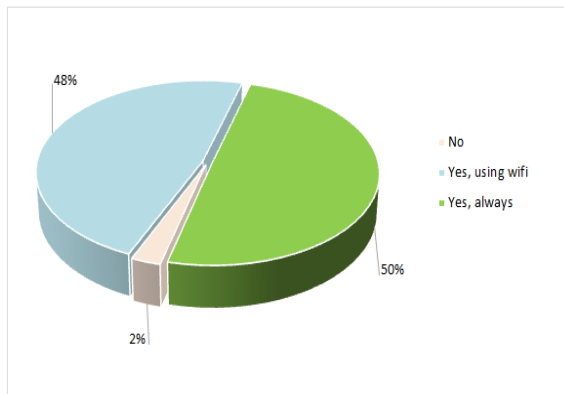


Figure 3. Connectivity available on students' mobiles.

### 3.4. Determining How Using Smartphones Affects the Teaching-learning Process

- c) Helpfulness in the teaching-learning process: 45% of systems engineering students in National University of Trujillo considers that using smartphones is moderately important in the teaching-learning process, 25% of them thinks it is considerably important and 23% says is very important.

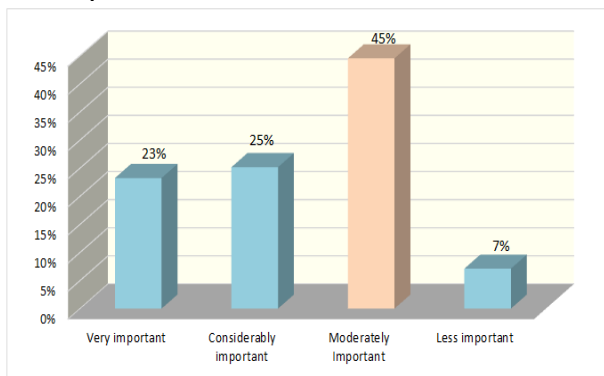


Figure 4. Helpfulness in the teaching-learning process noticed by systems engineering students in National University of Trujillo

- a) Dependence analysis: Using Chi-Square test, the dependency of smartphones and teaching-learning process was analyzed. The results would suggest statistically if there is a dependency between the elements analyzed.

Table 1. Dependency between Smartphone and teaching-learning process

Chi-Square Tests			
	Value	df	Asymp.Sig (2-sided)
Pearson Chi-Square	18,090 <sup>a</sup>	9	,034
Likelihood Ratio	18,496	9	,030
Liner-by-Linear Association	12,276	1	,000
N of Valid Cases	155		

a. 7 cells (43,8%) have expected count less than 5. The minimum expected count is ,50

With a 0.05 level of significance, it could be said that there is a dependency between smartphones and teaching-learning process (p-value =0,034 smaller than 5%).

## 4. Discussion

This research was an effort to determine the influence of using smartphones in the teaching-learning process of systems engineering students in National University of Trujillo.

Mobiles, that in the very beginning were just tools to communicate and amuse, today is used in different fields as education [2]. By the way, systems engineering students in National University of Trujillo use smartphones not only for entertainment, but also for their professional improvement. This statement is supported by the 45% of the students who consider smartphones as moderately important, the 25 % who consider it considerably important and the 23% who consider it very important. Merging those groups, it could be said that 70% of the students consider it important. Consequently, National University of Trujillo should work on insert mobile applications related to the teaching-learning process. By doing that, an undiscovered use of smartphones would be developed.

The research results agree with those from Salcines Talledo & Gonzales Fernández (2015), who show that, even the low pedagogical implementation of smartphones, professors and students notice more advantages than difficulties in their classrooms. In addition, it was proved that students could use their mobile applications for educational topics, even if apps were not created specifically for them (WhatsApp 66%, social media 59%, web pages 53% and YouTube 46%).

Finally, Chi-square tests confirmed the dependency between Smartphones and teaching-learning process (p-value was 0.034 which is lower of the 5% level of significance used) in a statistically way.

## 5. Conclusion

This research could determine the influence of using Smartphones in the teaching-learning process of the Systems Engineering's students in the National University of Trujillo. To achieve that, the literature revision was really important for the investigation, specially, the selected information from Salcines Talledo & Gonzáles Fernández, (2015). Both shows that, despite the little pedagogic implementation of smartphones, students and professors feel more advantages than difficulties from it in university classrooms. In addition, chi-squared test was run after the developing and distributing of a gathering instrument (questionnaire) in a sample of 155 students. The results demonstrate the dependency between the two components analyzed (with a p-value equal to 0,034). It means that using Smartphones influence in the teaching-learning process of the Systems Engineering's students in the National University of Trujillo. In that way, numbers could promote the use of smartphones in university education. For example, educational apps might be used to let students develop new skills or increase the ones that are already part of their background.

### Conflict of Interest Statement

The authors declare no conflict of interest.

### References

- [1] J. OrganistaSandoval, L. McAnally Salas & G. Lavigne. The smartphone as a teaching tool. *Apertura* (2013) 6–19.
- [2] O. Montero Ríos, F. Aguilar Acevedo, G. Reyes Jiménez S. Pacheco Bautista & D. Pacheco Bautista. Context-based mobile application to encourage English language learning. *Revista electrónica de computación, informática, biomedica y electrónica* (2017) 1–19.
- [3] F. Galíndez Oré, ¿Qué es Universidad sostenible?. Reviewed December 15th 2019 from <https://www.gestiopolis.com/que-es-universidad-sostenible/>
- [4] UNESCO. El futuro del Aprendizaje Móvil: Implicación para la Planificación y formulación de políticas (2013). Reviewed December 15th 2019 from <http://unesdoc.unesco.org/images/0021/002196/219637s.pdf>.
- [5] I. Salcines Talledo, & N. Gonzales Fernández. The Smartphone in the teaching-learning-assessment in Higher Education. Perceptions of teachers and students. *Revista Electrónica de Investigación y Evaluación* (2015) 1–20.