

# The Place of Computer Science in the Processing of Master's Theses of Students of the National Higher Institute of Popular Education and Sport (N.H.I.P.E.)



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**Abstract:** This article highlights the place of computer science in the processing of Master's theses of students in the National Higher Institute of Popular Education and Sport (N.H.I.P.E.) of the Cheikh Anta Diop University of Dakar (UCAD). In fact, the main objective of this research is to see the students' level of appropriation of the computer tool in that Institute during the writing of their Master's theses. To better tackle this topic, we have focused on a purely qualitative research methodology with documentary research, observation and interview as a technique. Finally, the results from the field show that computer science has a positive influence on the processing of students' Master's theses within the Institute even if there are malfunctions to be improved and corrected.

**Keywords:** Computer science; Computer; Internet; University; Research

## I. INTRODUCTION

Education plays an important role in the development of a country. Therefore, it is said that there is no true development without a good education. Moreover, the United Nations Development Program (UNDP) reiterates this by maintaining that no country can claim development without having achieved at least a school enrolment rate of 70% and that of literacy of 40% [1]. In addition, Information and Communication Technology (ICT) is also a fundamental element for the economic, political and social development of human societies. This is why ICTs are now seen and perceived by international governments as a key tool in the global education system. In doing so, we note that the latter offer different countries a panoply of new types of education models. In Africa, Member States seem to have high hopes for ICTs and their use in the educational system. It is in this sense that it is necessary to understand the fact that most of the priority programs of development and education actors and partners are focused on the integration of ICTs in higher education.

According to Richard Morin (2009), the World Bank, UNESCO, the African Union (AU), the West African Economic and Monetary Union (WAEMU), the Francophonie University Agency (FUA), the African Virtual University (AVU) and sub-Saharan States have put ICTs at the heart of their public policies [2].

Therefore, this seems to say that now the focus is oriented towards ICTs despite their low penetration rate in these countries (ITU, 2008) [3]. For Abdoul Ba (2003), ICTs are increasingly emerging as a lever for scientific development in this part of the world [4].

In Senegal, attempts at ICTs development seem to have been settled since the 1960s. Indeed, it should be noted that many attempts have been made by the public authorities to introduce them at the level of the national education system. From radio to computers and television, the Senegalese educational system has undergone many changes within it. Precisely, in 1982, computer science and computer are experimented in the educational environment through the Logo project, implemented by the Ministry of National Education and through the Higher Normal School (HNS) with the aim of studying the impact of the use of computers and computer language by six-year-old students on the learning of school subjects [5].

Better still, in 1989, the Ministry of Scientific Research launched the Project for the Introduction of Informatics in the Educational System (PIES) in order to introduce teachers and students to computer science and the use of computers.

This is made possible thanks to Senegal's connection to the Internet in 1996 and the publication by the United Nations Economic Commission for Africa (ECA) of the African Society in the Information age Initiative to be able to "strengthen and facilitate access to information and promote social communication" [6]. In this wake, the Senegalese authorities and the National Telecommunication Company (SONATEL) are committed to promoting ICT at the national level.

This will clearly contribute to the rapid progress of the computer and the Internet throughout the national territory. Indeed, we will note the establishment of the Intertropical Computer Network (RIO) node by ORSTOM in the years 1989-90 before Senegal was connected to the Internet in 1996 by SONATEL [7].

Manuscript received on 23 May 2022.

Revised Manuscript received on 03 June 2022.

Manuscript published on 30 June 2022.

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## The Place of Computer Science in the Processing of Master's Theses of Students of the National Higher Institute of Popular Education and Sport (N.H.I.P.E.)

After the establishment of structures such as the SYFED-REFER Center of AUPELF, which has become the Francophone Digital Campus (CNF) of the Francophonie University Agency (FUA), the Centre of the African Virtual University (AVU), the internet cafe of the university library, the Wi-Fi space of the Cheikh Anta Diop University, the private internet cafe in the vicinity of the university, the SINKOU cyber campus, the internet cafe of the faculty associations, the implementation of the "one student, one computer" project, Dakar's university community is characterized by the development of an environment in which the use of ICTs is now trivialized. Therefore, the university community is forced to use these tools pedagogically and scientifically. It is on this level that we were interested in the place of computer science in the processing of Master's theses of students of the National Higher Institute of Popular Education and Sport (NHIPES) of the Cheikh Anta Diop University of Dakr (Senegal). More specifically, it will be a question of seeing how the mastery of these ICTs can positively influence the realization of the students master's theses? To do this, we will, firstly identify the research methodology, secondly define the key concepts of the article and at last present, analyze and discuss the collected data.

### II. METHODS AND TECHNIQUES OF INVESTIGATION

This research paper was carried out within the National Higher Institute of Popular Education and Sport (N.H.I.P.E.) of the Cheikh Anta Diop University in Dakar (Senegal). Indeed, the data collected were obtained on the basis of a purely qualitative methodology because it was based on a review of the writings, an observation and an interview.

N.H.I.P.E. is an Institute that has a Faculty rank with three (03) respective Departments: Department of Physical Education and Sport (PES), Department of Physical Activities and Animation (ASE) and finally Department of Administration, Management and Control of Physical, Sports and Socio-Educational Activities (AGCAPSE). Thus, the actual research work has been carried out within the PES Department. However, this choice is not free since it is the department that has more Master's students.

The review of the writings was made thanks to a documentation collected throughout a scientific literature related to our research theme and also from the academic and administrative authorities as well as the computer trainer of the Institute.

In this research paper, two kind of observation were used: the direct observation and the participant observation. Indeed, the direct observation has allowed us not only to do the field investigation itself but also to compare the secondary data with the realities on the ground. As for the participant observation, it is explained by the fact that we are one of the trainers who deliver the research methodology course. Finally, the semi-directive interview was not only carried out through resource persons of the Institute who are in relation with our research topic but especially with some Master's students who are ahead in the writing of their end-cycle dissertations. Thus, the guide that has been developed has focused on the hourly volume of the computer science course, on the types of data collection and processing

software that are taught, the number of computers available to the Institute, the type of Internet or modem existing as well as the speed and finally the impact of these computer equipment on their memory work. In total, thirty actors were interviewed and the transcripts were subject of content analysis.

### III. CONCEPTUAL ELUCIATION

At this level of our work, it is precisely a question of defining the key concepts related to our research object. These are two (02) main concepts: ICT and Research.

#### 3.1. ICT (Information and Communication Technologies)

It should be noted that it is not easy to define the term ICT because of its different contains and diverse realities. In fact, according to Mohammed Mastaf (2016) "the introduction of information and communication technologies in the field of education has led to the emergence of new concepts and acronyms such as ICTE, NTICE, NTE, TE, ICT integration, ICT uses, etc. These terms are generally defined by referring to the disciplinary fields, situations and period in which they are used. ICTs, ICTEs, their integration and their uses present some ambiguities and blurred boundaries, offering the possibilities of being used in different directions according to the disciplinary fields and sometimes even within the same field" [8]. For Pascal Lardellier (2006), ICTs are made up of these "new communication machines" which, little by little, have conquered all sectors of working life, having managed to fascinate especially young people. According to him, "parents and teachers should assume their responsibility to direct adolescents towards the beneficial uses of these modern communication tools otherwise they will pervert the education of adolescents" [9]. This assertion by Lardellier shows that there are ICT issues on the African education system in general and on its higher education in particular.

#### 3.2. Research

According to Cheikh Anta Diop (1974), research is the source of renewal of the world in the most general and profound sense. Indeed, it provides new techniques for the field of daily practice, it increases man's grip on nature and makes him an active agent of transformation of the world [10]. Therefore, research is a fundamental element in the process of development of human societies. Thus, it plays an indispensable role in all economic, scientific, technical, social and cultural sectors. Moreover, it should be noted that higher education and research induce the progress of peoples through innovation, inventiveness and creativity. According to Jacques Fame Ndong (2015) since antiquity, the production, dissemination and renewal of knowledge are the catalysts for the rise of civilizations. However, Africa is far from having reached the critical mass of qualified personnel to ensure its development and is doing poorly in terms of higher education and research. About 10 students per 1,000 inhabitants with a great disparity by sub-region and by country [11].

At the cheikh Anta Diop University, it is important to note that efforts have been made in the field of research, especially with the implementation of the Bachelor's, Master's and Doctorate (BMD) system. Indeed, with the writing of their dissertations, students are obliged either to have a computer to do so or to work with the computer. This is the relevance of our research object.

#### IV. PRESENTATION OF FIELD RESULTS

After conducting the empirical phase, i.e; the field surveys, we can present our qualitative data under different axes:

##### 4.1. The hourly volume of the computer module

During our field survey, it was noted that there are fifty five (55) students enrolled in Master's degree in the Physical Education and Sports (PES) department. Indeed, the hourly volume that is assigned to the Computer Science module is thirty (30) hours. However, the trainer of this module told us that "this hourly volume is insufficient insofar as it does not allow not only to complete the entire program but especially to deepen certain chapters related to the mastery of computer tools applied to the writing of an end-of-cycle thesis". Moreover, this same remark of the head of computer science of that institution is noted among the students we had interviewed. And according to them "the hourly volume is very insufficient given the requirements of mastering computer tool, especially in the context of the writing of their final dissertations". Focusing on these two (02) speeches of our targeted actors, it is urgent to note that the hourly volume despite the requirements of the BMD system could be increased in order to allow learners to be equipped with methods and techniques in computer science.

##### 4.2. The types of data collection and processing software taught

According to the trainer and IT manager, the software that is taught are among others "the sphinx, Satta, Spss... ». In addition, he told us that the "sphinx" is the most used software by students during the writing of their end-cycle dissertations. These words are also supported and corroborated by those students who think that "the sphinx software is not only more practical but also easier to handle". In addition, he also had to inform us that the students learned some components of computer science such as office automation namely Word, Excel, Access, PowerPoint, etc. Precisely, according to him, some of them also prefer to use "advanced excel" software for the collection of their field data.

##### 4.3. The number of computers available to the Institute

The academic authorities of the Institute inform us that there are currently sixty (60) computers in the multimedia room. Indeed, according to them, these computers were obtained thanks to the "Performance Contract Program (CDP) between Cheikh anta Diop University and the World Bank". Thus, these computers have enabled the Institute to strengthen the quality of student training. Better still, the computer trainer says that the arrival of these computers has allowed "the strengthening and enhancement of the multimedia room with especially the diversification of the characteristics of these computer tools". Students think that "the amount of the number of computers is insufficient in the sense that the ratio of students to computers is tiny". However, they welcome "the efforts made by the

pedagogical and academic authority for the modernization of their training".

##### 4.4. The type of internet or modem existing and the speed

At this level of our interview guide, three (03) actors had given their points of view on the situation of the Internet within the Institute. According to the management, "efforts have been made so that all actors can have the internet in real time". But unfortunately, the Internet has so far not been able to satisfy the institute's stakeholders because of the dilapidated infrastructure. Regarding the trainer and head of the computer module, "the internet speed currently available to the Institute is 700 Mbps. This volume, according to him, is low because it cannot on a daily basis "satisfy the demand of the actors". Finally, according to the students, the quality of the internet is "very insufficient within the institute given the low speed".

##### 4.5. The impact of these computer equipment on their memory work

The students interviewed believe that computer equipment has had a positive impact on the writing of their end-of-cycle dissertations. For this, they put forward the following reasons:

- First of all, the fact that all memories must be entered and written via the computer tool. This means that from the conception of the research topic to the defense of the dissertation through the collection of data, the computer tool is at the heart of the writing of their dissertations;
- Then, apart from the desktop computers that the Institute has at the level of its multimedia room, some of them had to obtain a laptop via the program of the Ministry of Higher Education and Research (MESRI) "one student, one computer". According to them; they knew that obtaining these computers will allow them to prepare the process of writing their scientific work in general and their end-of-cycle dissertations in particular;
- Finally, they also magnified the use of "sphinx and excel" computer software as part of the collection of their field data. For them, this software has made it easier for them to design and process empirical data.

#### V. CONCLUSION

In total, it should be noted that computer science occupies a prominent place not only in the academic and pedagogical within the National Higher Institute of Popular Education and Sport (INSEPS) of the Cheikh Anta Diop University of Dakar (UCAD) but especially in the scientific work of Master students. Indeed, the field survey showed us the different situations of the practice of computer science within this said Institute. Thus, despite dysfunctions noted in the implementation and operationalization of certain computer accessories, the students interviewed think that the computer tool is a great contribution in the writing of their Master's theses. However, all the actors interviewed note that there are still efforts to be made to further modernize the Institute's computer park for the great benefit of students.

## REFERENCE

1. UNDP Contribution Report on SDG4 United Nations Development Programme (UNDP) on Sustainable Development Goal (SDG) 04 on "Ensure equal access to quality education for all and promote lifelong learning opportunities".
2. R. Morin, Africa ICT and Education Survey: Africa ICT and Education Survey, World Bank, 2009.
3. International Telecommunication Union (ITU), 2008.
4. A. Ba, Internet, Cyberspace and Uses in Africa. Paris: Harmattan, 2003.
5. In 2004, the Higher National School became the Faculty of Science and Technology, Education and Training (FASTEF).
6. M. L. Seck, Public Policy and Internet in Higher education institution in Sénégal, Dissertation in information and communication sciences, Charles De Gaulle University (Lille 3), 2003-2004.
7. The Intertropical Computer Network (RIO) was established in Senegal in 1991 at the Oceanographic research Center of Dakar-Thiaroye (CRODT).
8. M. Mastafi, DEFINITIONS OF ICT(E) and Meaning. Jacqueline Bacha; Sandoss Ben Abid-Zarrouk; Latifa Kadi; Abdelouahed Mabrou. Thinking about ICT in Maghreb universities, L'Harmattan, 2016, 978-2-343-09902-6. hal-02048883
9. P. Lardellier. The Thumb and the Mouse: A Survey of Teen Digital Literacy. Paris, Fayard, 2006.
10. C. A. Diop "Perspectives of Scientific Research in Africa", African Notes No. 144, Fundamental Institute of Black Africa (IFAN), October 1974, pp. 85-88.
11. J. F. Ndongo, "What higher education and research, in Africa, by 2015", Géostatégiques, 2015.

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