

Towards the use of a contact center for the socialization and capacity reinforcement of learners of African digital universities

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Abstract— Universities in sub-Saharan Africa today face major challenges including massification that affects the quality of training. It is to meet this challenge of massification, that in favor of the implementation of the LMD reform, the CAMES invited all the member universities to develop open e-learning opportunities. Indeed, methods and models of teaching and learning have been disrupted by the eruption of digital: we talk about digital education or ICT for education or education. Senegal, following the Presidential Council on Higher Education and Research, decided to put ICT at the heart of the development of higher education and research to improve access to higher education and efficiency of the system. Similarly, Côte d'Ivoire is also committed to using ICTs to improve the learning and governance of its education system. In addition to the integration of ICT in the higher education system, some countries have taken the option to set up virtual universities: this is the case of Senegal, Côte d'Ivoire, and Burkina Faso and from Chad.

The establishment of these virtual universities has propelled research in the field of ICT and e-learning, even though before it interested research teams according to the IFIC report on ICT research in sub-Saharan Africa published in 2014. This is how we conducted research on the socialization of learners in a digital university. In this article, we offer a ToIP platform that provides call center services, SMS over IP and feedback of learners' fact sheets to reduce the dropout rate related to the isolation of actors.

Keywords— e-learning, ToIP, socialisation, TICE, virtual university

I. INTRODUCTION

The influence of technologies in our society is well established; the digital transformation has affected all sectors of activity: industry, health, education, etc. In education, from the concept "computer for all" to 1985, we move to ICT to add an educational dimension. ICT includes both social practices, technical infrastructures, registration materials, content, modes of transmission, types of practices, etc. [1].

On the other hand, in Africa and particularly in Senegal, higher education faces a number of difficulties. Among which we can mention the lack of infrastructures to accommodate the

students and the insufficiency of teaching materials. Despite a sustained growth rate at the baccalaureate level, Senegal is far from reaching the ratio of the need for higher education in a country that aspires to the emergence, set by UNESCO, to 2% of the population of access to higher education [2]. Senegal, which aims to become an emerging country, is 0.8% [3]. Yet in recent years public universities in Senegal are unable to absorb new graduates. It is in this context that the Virtual University of Senegal (UVS) was born in 2013. Like Senegal, Côte d'Ivoire launched the Virtual University of Côte d'Ivoire (UVCI) in 2015 [4]. Other digital universities exist in Africa, this is the case in Tunisia and Egypt. And other countries are now in the study phase to implement their virtual university (Mali, Burkina, Chad, etc.).

These digital universities have the distinction of welcoming new graduates. We recall that at the beginning, e-learning was a model dedicated to adult education. In a context of digitizing training, digital culture is a prerequisite for the learner to succeed. In addition, there is the isolation of the learner. Jean Frayssinhes [5] in his thesis argues that the main factors of abandonment of learners in e-learning are essentially the isolation of the learner, a lack of ergonomics of the learning environment (educational or technological) and the lack of autonomy of the learner.

We propose in this article, a platform based on IP telephony to solve the problem of isolation of learners. The rest of this paper is structured in four sections. In section II, we present e-learning devices. Sections III and IV present respectively the problem of learner socialization and ToIP technology. And finally, section V describes the different features of the contact center.

II. REMOTE EDUCATION TOOLS

A. On the pedagogic plan

In an e-learning device, the pedagogical approach is rather constructivist and learner-centered [6].

From a pedagogical point of view, the differences between e-learning and conventional devices can be explained according to the following three points:

- Disappearance of the "face and face";

- the "time" aspect during learning;
- The empowerment of the learner.

Indeed, when we talk about e-learning, it is because there is no longer a direct interaction between the learner and the teacher as is the case in a classroom training device. The physical presence of these two actors in one and the same space disappears. These exchanges can thus take place without time constraint. E-learning offers greater flexibility than the face-to-face at the level of learner management. The learning system offers "just-in-time" learning in that it allows access to information when it is needed, and in a place chosen optimally: at home, at the library, at work, ... Unlike face-to-face, where the institution sets schedules and days of training.

In this context, the learner is obliged to "self-educate", hence the empowerment of the learner. The activities are designed to facilitate the learner in building his knowledge. In classical education, however, knowledge transfer is done with the support of the teacher during classroom lessons, and during tutorials sessions. A significant difference between e-learning pedagogy and face-to-face pedagogy is the development of cognitive abilities of the learner. The e-learning learning system must allow the learner to develop skills in searching for, finding and performing various treatments of relevant information. Constructivist learning situations are reflexive.

A final essential point in e-learning pedagogy is collaborative work. To overcome the effect of distance between learners, group and team activities are developed to integrate the social dimension into e-learning.

B. The actors

A first difference between the classical teaching and e-learning system is in the classification of the actors. In the classroom, there are two main actors in the learning system:

- The learner
- The teacher

While in e-, the number of actors increases. In fact, alongside the actors learning essential to the whole learning process, Learners and Informer, there is another category of actors qualified as facilitators.

Figure 1 shows the different actors that we propose in an e-Learning device.

It should be noted that these actors each have roles, but a role can be defined by several actors. And according to the training, the different actors can be played by several people. The difference is in their roles. If in face-to-face, the teacher can be at the same time trainer, designer, informant, in e-learning each role can be played by only one person.

Another difference between the e-learning and the training device face-to-face, on the side of the actors, is the tutor. It is a versatile person integrated into the e-learning who has a supporting role to the student in order to achieve his objectives.

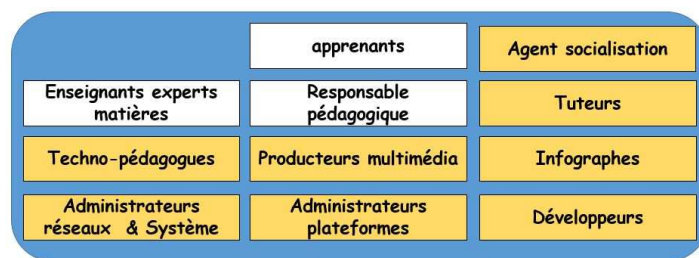


Figure 1: The actors

C. The Tools

In some traditional teaching models, most often in Africa the tools do not even exist. But everything depends on the level of use of information and communication technologies (ICT) in the institution. The mode of use of the tools may vary from an enriched class to a virtual classroom in an e-learning device.

In comparison with the face-to-face system, e-learning uses a virtual environment to bring the collaborative side of the training. Learners are grouped together in a virtual classroom to communicate with each other and with the tutors. Teamwork is also organized at the level of the e-learning platform.

These platforms, also called LMS (Learning Management System) are equipped with communication tools such as messaging, chats, discussion forums, etc.

These tools do not exist face to face, it is rather the oral and "physical" communication that is used.

Digital documents and presentation tools for these documents such as the video projector can be used in class in an enriched class.

The LMS offer tools that allow you to:

- manage the learners' journey;
- facilitate tutoring and team work;
- administratively manage the training;
- extract statistics on training;
- etc.

Figure 2 below, proposed by Stéphane Brunel, Philippe Girard and Merlin Lamago shows in categories, the different functionalities of an e-learning platform [7]. Most of the features described are centered on pedagogy, however the social aspect of learners is not taken into account, even if collaborative learning contributes to it.

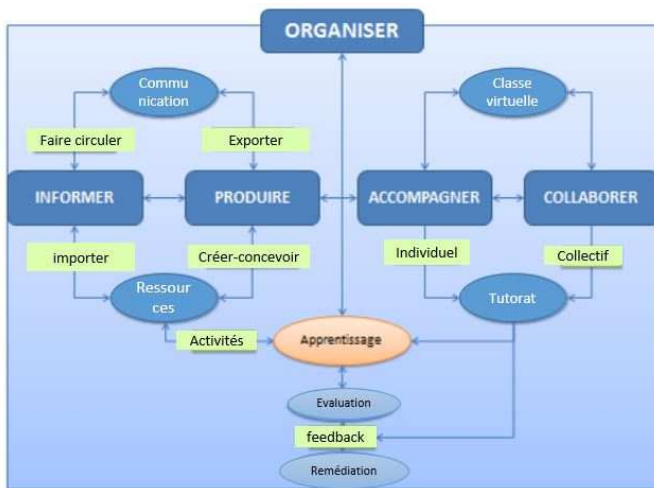


Figure 2 e-learning platform features

III. SOCIALIZATION OF LEARNERS IN AN E-LEARNING TRAINING TOOL

According to Gerard Neyrand [8], in the world of education, the term socialization constitutes "the place of a confrontation between psychological and sociological approaches and can be understood as the adaptation of the individual to his environment by processes participating as much in the learning of relational interaction as in the internalization of collective norms and social codes, and the psychic constitution of the person. In this context, the socialization of learners can be analyzed according to three relationships:

- Relationships between Learners-Faculty;
- Relations between Learners-Administration;
- Learner-Learner Relationships;

In e-learning devices, these different relationships are implemented in digital work environments (ENTs), and also digital campuses are open to relay the institution. However, we have noticed a high drop-out rate in this mode of training, especially for new learners. Digital universities such as the Virtual University of Senegal and the Virtual University of Cote d'Ivoire welcome new graduates. These pedagogical models, new in the context of sub-Saharan Africa, are still apprehended by "young" students and whose digital culture is "satisfactory". We must find means or channels of communication to follow students in difficulty, both administratively and pedagogically. Even if collaborative learning, evoked by certain socio-constructivist approaches, shows that the activities of socialization, contribute to success and perseverance [9], students of digital universities.

IV. LA TECHNOLOGIE TOIP

TOIP is a public and private telecommunications service that uses the Internet IP protocol [10]. Its technology makes it possible to rely on existing infrastructures to connect IP-Phone terminals and Softphones. ToIP offers traditional telephony features such as forwarding, double calling and

referrals. It also allows to connect a phone to an advanced communication platform to benefit from features such as CTI (Telephone and Computer Coupling), conference bridges, call recording, fax-to-mail, mail-to-fax...

IP telephony uses an IP data network to provide voice communications to all staff in an institution over a single voice and data network. The convergence of data and voice communication services brings benefits related to the reduction of investment costs, the simplification of configuration and maintenance procedures.

It allows interesting prospects for simplification of architecture and administration of equipment but also new enriched services. Substantial gains can be made by:

- Setting up Unified Messaging
- productivity gains (call routing, interactive voice server, standard);
- queue management.
- Reduce cabling costs: the phone connects to the local network.

V. IMPLEMENTATION OF A CONTACT CENTER

A. Motivations

The e-learning platforms have certainly a set of tools for collaboration and communication (mail, chat, forum ...) but the socialization of the learners is not taken into account in these functionalities. In fact, learners expected to have physical contact with teachers in case of major difficulties in a teaching module. It is in this context that we propose to digital universities to integrate a contact center for socialization and remediation of learners.

On the one hand, this platform allows the social service to receive calls from students in difficulty in order to listen to them, support them, accompany them and advise them socially while collecting the data collected for statistical analysis purposes; on the other hand to connect students who have difficulties in a teaching module with teachers for further explanation.

In the literature several studies have shown that social skills are a very important goal class but are neglected in most online training platforms [11].

B. Functional Analysis

The different actors of the socialization platform are students, social workers and teachers. It incorporates the following features:

- phone calls with feedback from learners;
- Personalized contact of students with a social worker;
- IP phone and sms campaigns to students and teachers;
- value-added services allowing students to access tuition services via SMS over IP.

The interactions between the system and the different actors are illustrated by the following use case diagram.

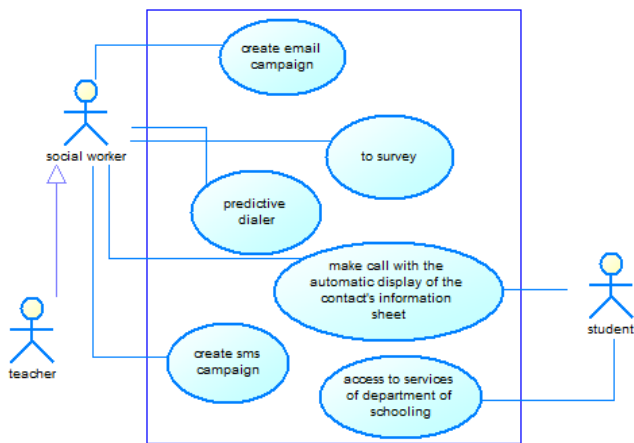


Figure 3 Use case diagram

C. The components of the solution

The main components of the platform are:

- A set of TOIP servers consisting essentially of asterisk [12] and freeswitch [13] integrating the functions of call center and SMS over IP.
- A web application developed in-house, integrated with Xivo [14] for the management of students' information slips during calls to the platform.

D. Presentation of the results

Case 1: A student calls the social service of the university, a record is made on the monitor of a social worker before stall and throughout the communication. This allows him to view information about the caller and note on the card some elements of the discussion with the caller.

Figure 4 shows a web interface for a user profile. The profile includes a photo and fields for:

- NAME: [empty]
- Number: [empty]
- Last name: [empty]
- First name: [empty]
- ENSC: [empty]
- Address: [empty]
- Channel: [empty]
- Email: [empty]
- Request: [empty]
- Request: [empty]

 Below the form is a table of 'Last requests':

Date	Request	Status	Action
2015-09-25 13:32:03	Request to reset mail account	Success	

Figure 4 call with slip

Case 2: sms / mail campaign

A social worker creates a sms campaign or information mail to learners or teachers.

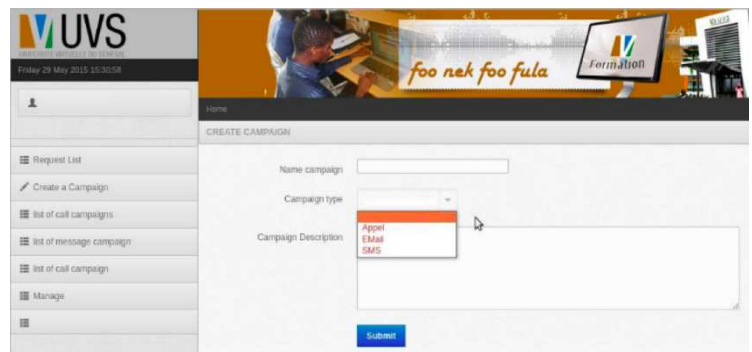


Figure 5 create a campaign

Case 3: Use of tuition services by SMS over IP

The student sends a text message from his IP phone to have information about his notes.

Figure 6 shows a form for entering student information and a table of partial notes. The form includes:

- Nom: [empty]
- Prénom: [empty]
- INE: [empty]
- Filière: [empty]

 The table of partial notes is:

Matière	Contrôle	Examen
Algo	10.0	14.0
Réseaux	15.0	14.0
Programmation	15.0	14.0

Relevé Partiel de Notes

Figure 6 use of school services

VI. CONCLUSION AND PERSPECTIVES

If the orientation of new graduates and the creation of digital universities represents a great challenge for governments; the socialization of learners in e-learning remains a research and development issue for the actors of higher education institutions. The report "The socialization of e-learning students in Canada" published in 2014 by the "Réseau d'enseignement francophone à distance du Canada" proposes the use of social networks and collaborative activities. In our context, the socialization of students is analyzed under the isolation of the learner who induces a high drop-out rate (about 20% between 2013 and 2015). The latter motivated the establishment of a platform for socialization and remediation in the form of a contact center that helps maintain a large number of learners who were initially disoriented because of the transition from the classical classroom teaching mode to a mode of e-learning. The contact center was used during a call

/ SMS campaign to further socialize the actors. We intend to generalize the use of the platform to all students of the UVS and build a database of information collected.

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