Design and Implementation of a Blended Learning System for Higher Education in the Democratic Republic of Congo as a Response to Covid-19 Pandemic

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Abstract—Until now, the higher education system in the Democratic Republic of Congo has relied on the traditional face-to-face teaching method, which consists in the real physical presence of students and teachers during classes and lectures. Thus, the United Nations Educational, Scientific and Cultural Organization (UNESCO) is currently advocating e-learning as the only alternative for education in the COVID-19 era. It goes without saying that this requires specific frameworks and appropriate resources, including access to a good quality internet connection. Several countries around the world have implemented this recommendation since the first quarter of 2020 to protect their populations from the significant risks of Covid-19 contamination. In educational environment however, given the disadvantageous realities of the Democratic Republic of Congo, including the cost and quality of internet, the low rate of electrification, and the lack of experience of the educational stakeholders involved, the shift to e-learning remains a challenge. Thus, we propose in this paper a blended learning model that can smoothly introduce e-learning through a platform specially designed to integrate the traditional way of delivering courses in Congolese higher education with e-learning based on ICT.

Keywords—Covid-19, e-learning, blended learning, blended didactic model, face to face teaching, ICT

1   Introduction

The Coronavirus (COVID-19) pandemic, that has hit the world since 2020, has brought significant changes and transformations to the world. By the end of 2019, COVID-19 began to spread rapidly around the world, causing the death of thousands of people. The COVID'19 epidemic tested the readiness of educational institutions to offer distance education [1]. In terms of teaching and learning methodology, the COVID-19 epidemic has had an impact on many educational institutions. Face-to-face instruction has been phased out of many schools, colleges, and institutions [2]. As a result, several countries initiated relevant strategies to contain this virus. Subsequently, all spheres of life have been affected and all sectors of governance have been impacted,

including the education sector. In the Democratic Republic of Congo (DRC), in March 2020, the President of the Republic announced the closure, until further notice, of schools, colleges and universities throughout the country to stop the spread of COVID-19, ordering millions of students to stay home. While many countries around the world have been able to quickly develop alternative distance learning strategies, the education system in the Democratic Republic of Congo has not been able to meet the challenge of adapting to this new learning mode.

It is true that the Ministry of Primary, Secondary and Technical Education (STE) has successively proposed solutions to save education in the DRC, but the courses have been broadcast two hours a day on several national radios and continuously on the television channel of the Ministry In addition, a massive distribution of exercise books throughout the country was announced. The vodacom telecommunication company application, VODA EDUC, which is supposed to be accessible via the Internet to teach students at home, was also tested. However, all these initiatives were limited to the primary and secondary education sector and not to higher education. This is easily explained by the fact that all primary and secondary schools in the country follow the same school calendar, with the course content for each option being the same, being well defined, documented and scheduled throughout the year by the STE. This uniformity of content facilitated continuity, as all students were expected to be at the same level and could therefore relate to the instruction provided through these different alternative tools.

However, at the level of higher education in DRC, it can be observed that there is more flexibility in the approach to teaching. Although the basis is the same, each university has its own way of delivering courses. In addition, the professor is known to be the master of the course, having the ability to adapt the course schedule to his or her own schedule, to decide on the best approach, content, materials, and documentation for the course. In this view, tools such as radio or television would not work in a liberal and independent context. It goes without saying that popular learning management systems (LMS) such as Moodle and blackboard could have been deployed and applied. Unfortunately, there has been no initiative to integrate them and facilitate distance learning in universities and colleges. A few universities such as Catholic University of Congo (CUC) have tried to use the Zoom videoconferencing platform to continue delivering live courses. But overall, all teaching activities stopped during this period. This has led us to ask many questions, as several studies and surveys have suggested that higher education in Africa is in a much better position to face the challenges of the pandemic, as higher education students are adults and are much more likely than others to have access to the internet and online learning. So, without underestimating the challenges, provided universities are proactive and thoughtful, they can probably reduce the educational impact of Covid-19 on their students more easily than other sectors [3].

However, we note a willingness on the part of the Congolese government to change things, notably through the initiative to install free WIFI in all public universities to facilitate access to knowledge. In addition, in 2021, the Minister of Higher Education and University (HEU) prohibited the sale of handouts or syllabus stating that every teacher has the obligation of making available to the faculty the electronic version of

each course assigned to him. The initiative is commendable, but many professors deplore the lack of an adapted platform that will allow them to exchange electronic pedagogical and didactic resources with their students. All these realities reveal the major vulnerabilities of the current system to adapt to changes. The level of efficacy and preparedness for teachers, students and the entire education system is now being checked [4]. The need to develop our own digital learning solution for a flexible and resilient education model is therefore a major concern.

Until now, the Congolese higher education system has been based on the traditional approaches of teaching consisting in the actual physical presence of students and professors during classes and lectures, as well as paper evaluations. However, the recent health crisis has shown the limits of this system. Today, international education is promoting e-learning as the only alternative in the context of COVID-19 education, which requires special settings and appropriate resources. Many universities have successfully shifted to distance learning. For example, New York University, Shanghai, and Duke Kunshan University offer examples of successful adaptation and rapid deployment of educational technology products, such as the Zoom video conferencing platform and Moodle [5]. An important point to consider is that these universities had previous or existing experience with these technologies that they were able to scale; they were not starting from scratch with new and untested technological solutions. This is not the case for the Congolese educational institutions, which lack such preparation and planning. Moreover, in a country where the internet penetration rate is one of the lowest on the continent with nearly 19% for a population of 88.18 million people, or 16.35 million internet users [6], it would be illusory to believe that we could move to distance learning without significant adaptation difficulties. The other serious problem is the energy challenge facing the Democratic Republic of Congo. The country has one of the lowest rates of electrification in the world. Less than 10% of the Congolese population has access to electricity, 35% in urban areas (50% in Kinshasa) and less than 1% in rural areas [7] and without electricity, there can be no digital development.

2 Related works

The attention given to blended learning, a model of education where students combine classroom instruction with online training and resources is growing in reformist circles. Blended learning is also defined as a type of online and offline learning that combines the benefits of online and traditional learning [8].This new approach is now presented as a new way to individualize learning within competency-based education systems [9]. A lot of research has been done on e-learning and especially on blended learning systems.

In a Malaysian higher education institution, Farahiza Zaihan Azizan conducted an exploratory study on blended learning. The focus was on understanding what blended learning means, the implementation of blended learning in higher education institutions in Malaysia and the benefits that can be identified. He finally proposed a framework for blended learning to work best in higher education institutions in Malaysia [10].

Based on a survey of 400 higher education teachers, Jintavee Khlaisang and Maneerat Likhitdamrongkiat developed an online learning system in a blended learning environment to improve the cognitive skills of higher education learners. They used 120 students to test the system in three major disciplines established by Office of the Higher Education Commission Thailand. Data analysis indicated that there was a statistical difference between the pre-test and post-test scores at the .05 level of significance [11].

Kadek Suartama et al developed a mobile blended learning design to systematically guide the lecturer through the teaching processes. They created a mobile blended learning design by combining mobile learning and blended learning. Their instructional design is adaptable to learning and effectively promotes mobile blended learning [12].

Tubagus, M., et al. developed blended learning with Claroline as a learning tool to help students learn more effectively. They used a quantitative strategy to collect data utilizing pre and post tests, as well as questionnaires, to achieve their study's goal. Students studying Islamic economics were separated into two classes, with a total of 50 students participating in the study [13].

Because there are so many platforms that can be used for blended learning, it can be difficult for teachers and students to choose the most appropriate one, especially when learning mathematics and ICT. Ardana et al developed a decision support system to help teachers and students choose a blended learning platform that is suitable for learning a variety of subjects such as mathematics and ICT at SMK TI Uda-yana. [14].

3 Design context

According to research objective, we present and analyze the current learning system in higher education in the Democratic Republic of Congo to show how it functions, secondly at the end of analysis of the existing system, we propose solutions considering criticisms made on the existing system. Finally, we model and implement the new system.

3.1 Presentation of the current higher education system in DRC

About the course

− **Location**: Classes are generally held in an auditorium according to a set schedule that may vary depending on the availability of teachers.
− **Delivery of course**: Normally, the teacher teaches the theoretical parts of the course and is supported by assistants or work leaders who take care of the practical parts. But it often happens that the teacher is not available, he/she just introduces the course, and the assistants take care of the course from the beginning to the end. Assistants therefore play a significant role in higher education in the DRC. Teachers often dictate so that students can note down and the teacher often notes on a list the students who have a good application or grants them bonuses.
− **Teaching materials**: Students usually take notes, and if the teacher wishes, he/she provides syllabi or electronic documents that students can also photocopy, or less

often video or audio content in the form of CDs or DVDs. Sometimes written materials are not enough. In computer science field, for example, there is often a need to share project codes between students and teachers on a USB stick. This method often promotes the transmission of viruses between computers. Some teachers prefer to use a projector for better student interaction. They often project slides, videos, or whatever they are doing on their screens so that the students can do the same.

About the exchanges. In the past, students exchanged with each other or with their teachers mainly in the auditorium or on campus, but thanks to social networks such as WhatsApp, more and more exchanges are taking place online. A group is often created for the class in which all students are added and sometimes even professors and assistants. It is in this group that information, announcements, and sharing of files related to courses, practical work, evaluation results... Similarly for group or team evaluations, a WhatsApp group is often created with the different members and group leader to share ideas and resources. Teachers and assistants often share their phone numbers and email addresses so that students can reach them. Face-to-face exchanges are often done in the office.

About student assessment. To ensure that the students understand the courses, evaluations are used. The teacher may dictate the questions orally, or write them on the board, give each student a sheet of paper containing the questions, or give the Head of the class a file containing the questions in the case of a practical assignment. Assessments are often submitted in written form on paper and are corrected manually by the teacher or his assistants. These evaluations can be done in the auditorium or at home within a specific time frame. In the case of practical work, students often submit their resolutions to their head of class who will pass them on to the teacher. However, it is also possible to hand in the work directly to the teacher. The results are known either by handing in the corrected papers or often by publishing lists of the grades of each student, which are often stuck on the wall of the auditorium so that everyone can see their grade. However, these lists are increasingly shared in electronic format (pdf or word) in the class WhatsApp group. When a student challenges his grade on a practical work or a test, he talks to the teacher who, depending on his conviction, may or may not change the grade. There is also group work, students form groups according to a defined number, choose a leader and a subject. The subject can be given to them or can be the result of their personal choice if they agree with the teacher. The work is often a project to be defended or submitted in written form.

About the class attendance. Attendance is a major factor that shows the student's involvement in the course and can affect the student's deliberation and results. Attendance is managed as follows: Paper sheets called attendance lists are circulated in the auditorium for each student present to write his/her name. However, students often add the names of their absent classmates. This leads the teacher to call the roll at the end of the class to weed out the cheaters. After this step, the teacher will have to add the result of the attendance list to an electronic file containing the attendance of all the sessions of the course on his machine in Excel or Word. At the end of the course, the teacher calculates the total attendance of each student. There are however some rare teachers

who bring their machines to the course, take the call, and transcribe the result directly on their machines.

Final term paper and dissertations. To complete their undergraduate or graduate final Term paper or thesis, students choose advisors and co-advisors who will supervise them throughout the writing process. Often, the student proposes a topic to the advisor and discusses it with him/her. The director may also suggest a more relevant topic. Each time a chapter evolves, the student presents the work to the advisors, who corrects it and gives it back to the student. For their research, students are inspired by scientific works, articles, publications, and books that are available in libraries, but also online.

3.2 Review of the current system

For the management of the attendance, we observe that there is a triple task, students write their names at each session of the course, the teacher makes the call, the teacher transcribes the result of the call on his machine.

Students without course materials or syllabus take notes and try to understand at the same time, and often teachers who want to keep up with students start dictating the course, which slows the pace of the course, and the assimilation performance is not optimal.

Grading assessments and assignments manually is a tedious task, especially in a context where electricity is often lacking. Moreover, it is difficult for teachers to detect plagiarism online, as more and more students copy their resolutions online. Also, there is a lack of media diversity in teaching.

In analyzing that way, the results of the evaluations are published, we must note a lack of confidentiality. In addition, the fact that students hand in their assignments through class leaders can also have negative effects. Indeed, some less serious class leaders like to offer or even sell the homework or assignment resolutions of students considered bright to weaker or lazy students, to the detriment of their authors.

Sharing course resources in class WhatsApp groups is a good initiative. However, the problem with this system is that everything is mixed up, so that students are overwhelmed by messages from discussions, forums, audio messages and files related to the course, and it is difficult to keep track of them when they are not connected to the internet for several days.

It is sometimes difficult for students to meet with their thesis advisors to follow up on the progress of thesis at each stage due to their busy schedules.

The various scientific works carried out by students are most often piled up in libraries where it is not easy to find works relating to a subject on which one would carry out research.

3.3 The proposed system

Considering the criticisms made previously, we have proposed a blended educational system that we have called CISNET (Campus Information system Network) for the Congolese higher education which considers the following proposals.

— The class materials and all the media of the course are published by the teachers on an online platform so that students already know about it and that in the classroom, they will have further explanations, exchanges, discussion, and interactions.
— The call for attendance list is made in the classroom through the platform.
— The homework, assignments and tutorials are done on the platform, they can be done synchronously (in the auditorium the teacher publishes an assignment, and the students answer it on the platform) or asynchronously (the students submit the assignment later).
— Quizzes may or may not be done on the platform. It depends on the teacher's discretion.
— The publication of the results will be done on the platform. The platform will allow teachers to publish even the results of evaluations that did not take place on it, to allow them to calculate the overall average of the course for each student.
— Requests for thesis advising will have to be made online, as will the sharing of these progress files.
— Student theses and papers will be published on the platform to make them more accessible.

3.4 Design of the proposed system

The actors of the system. The analysis of the existing system of university education in the Democratic Republic of Congo gives us the following actors:

— Student theses and papers will be published on the platform to make them more accessible.
— The teacher or professor: This is the educator who owns a space on the system, creates courses in the system, manages its content, and invites his or her students to enroll.
— Student: A person who receives or follows instruction or training from a teacher or professor who also uses the system.
— Teaching assistant: This is a secondary teacher associated with the course by the tenured teacher and whose actions are limited by the rights and privileges granted to him.
— The administrator: This is the person who manages the system daily. The administrator can be a staff member of a university.
— The visitor: The visitor is anyone who does not have an account on the platform, but he can see the teachers registered on the platform, the publications and scientific works published.

Use cases of the system. Considering the roles that each actor must play, we have listed the following use cases:

Use case for the Teacher

— Authentication: this case allows the teacher to log in to their account.
— Course Management: Allows teachers to manage their courses and add course content, media, archive courses, close courses, and start a new academic year.

— Management of teaching assistants: Allows the teacher to add a teaching assistant for each course, give them rights and privileges.
— Attendance Management: Allows the teacher to schedule class sessions, take roll calls and view individual and general class attendance reports and statistics.
— Students' assessments management: Allows the teacher to add assessments of individual or group assignments, as well as quizzes, with the possibility of self-correction, and then publish the results with comments, and respond to student complaints about the results obtained.
— Students' management: Allows the teacher to manage his students, block them from the course, unblock them, add annotations on each one according to their individual application.
— Management of teacher's space: Allows the teacher to manage his information presented on the platform, his profile, his presentation, his research, etc.
— Management of requests for thesis advising: Allows the professor to accept or refuse students' requests for thesis advising and, in the case of acceptance, to exchange with them and send needed resources concerning the work at each stage.
— Management of supervised thesis: Allows the teachers to manage the student's thesis they have supervised.
— Scientific publications management: Allows teachers or professor to manage his/her scientific publications such as books, articles, etc.
— Management of notifications: Allows the teacher to be notified of events that occur such as each new course registration, when a student sends his or her resolution of assignment, thesis advising requests and new messages.

According to the above use cases of the participating teacher, we have the following use case diagram.
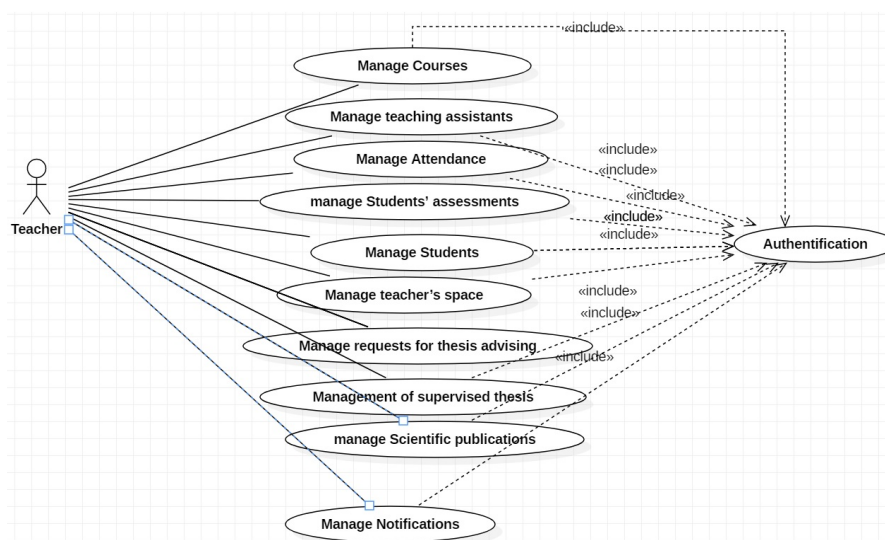
Fig. 1. Use case diagram for the teacher

Use case for the Student

— Authentication: This case allows the student to log in to their account.
— Enroll in the course: This use case allows the student to enroll in a course with the code that the teacher will give, to have access to all the content of the course.
— Access to course content: Students who have registered for a course must be able to access all course content and media, as well as the observations from teachers and their attendance records.
— Taking part in evaluations: The student enrolled in the course must be able to see the evaluations, send in their resolutions, see their results and corrections, send claims, and create an assignment group.
— Thesis advising request: The student can send a coaching request to the professor of his choice on the platform and be notified of the acceptance or refusal. If accepted, the student must be able to exchange with the professor and share files related to the progress of the work.
— Access to publications and scientific works: The student must be able to access all scientific works and publications shared on the platform.
— Profile management: Allows the student to manage their information presented on their profile.
— Receive Notifications: Allows the student to be notified of events that occur such as each addition of content to the course, each new assignment published as well as corrections, and the acceptance or not of his request for thesis advising, new messages received

According to the above use cases of the student actor, we have the following use case diagram:
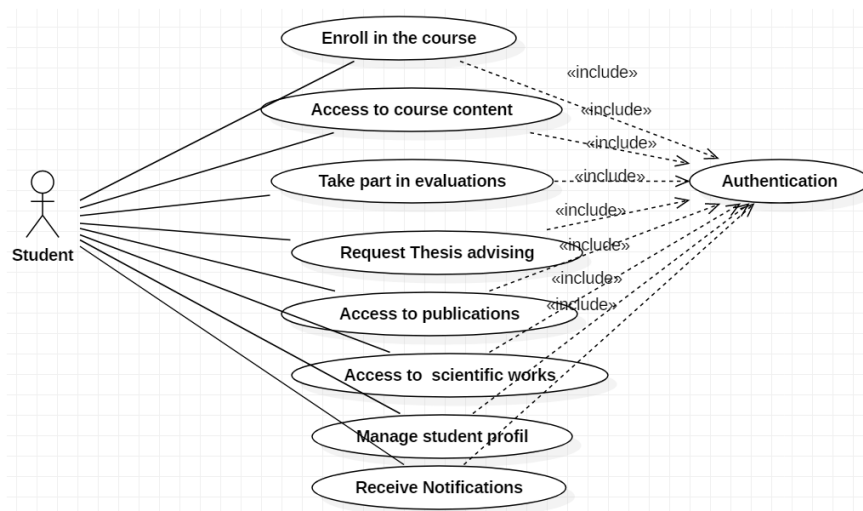
Fig. 2. Use cases for the student

Use case for the teaching assistant

— Authentication: this allows the teaching assistant to log in to the system.
— Course management: Allows the teaching assistant to manage the courses in which he has been appointed as an assistant. He can add content and media.
— Attendance management: Allows the assistant to schedule class sessions, take roll calls and view individual and general reports and statistics.
— assignments management: Allows the teaching assistant to add grades to individual or group assignments, as well as to quizzes, with the possibility of self-correction, and afterwards publish the results with comments, and respond to students' appeals on the results obtained.
— Manage students: Allows the assistant to manage his students, block them from the course, unblock them, add annotations on each.
— Manage Notifications: Allows the teaching assistant to be notified of events that occur.

According to the above use cases of the teaching assistant actor, we have the following use case diagram:
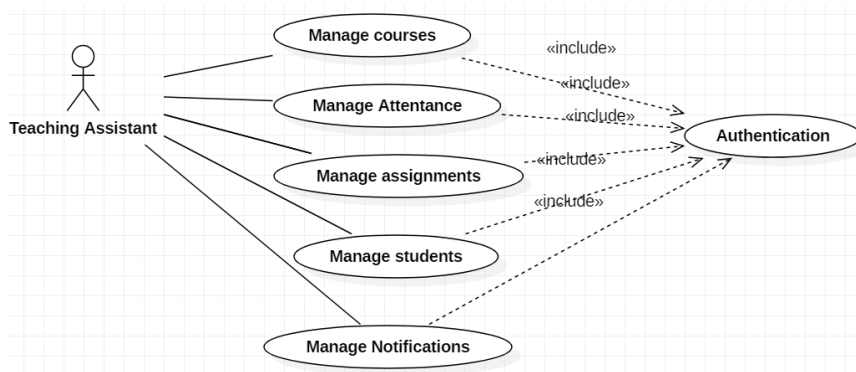
Fig. 3. Use case diagram for the teaching assistant

Use case for the administrator

— Management of notifications: Allows the teacher to be notified of events that occur such as each new course registration, when a student sends his or her resolution of assignment, thesis advising requests and new messages.
— Authentication: this allows the administrator to log in.
— Teachers' management: The administrator is the one who registers the teachers on the platform.
— Users' management: The administrator manages all the users of the system and can see all their information.
— Management of scientific works: The administrator can upload the scientific works of the students to publish them on the platform.

— Consult the statistics of the platform: The administrator must be able to see the number of users, students, teachers, assistants, courses.

According to the above use cases of the administrator actor, we have the following use case diagram:
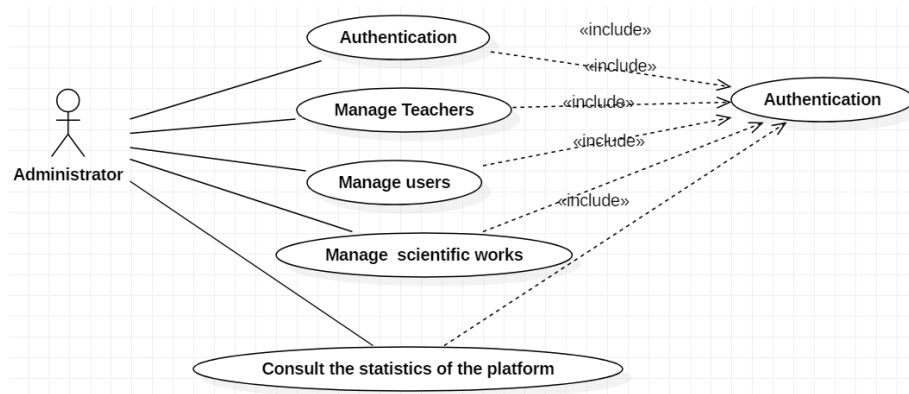

Fig. 4. Use case diagram for the administrator

3.5 Technologies used

To develop the application, we used HTML, CSS, JavaScript, Ajax, and jQuery. To make the application responsive, we used Bootstrap, which is the most widely used HTML framework, CSS, and JavaScript framework for creating responsive and mobile-oriented websites. On the backend, we used PHP, a server-side scripting language and a powerful tool for creating dynamic and interactive websites. For the database, we used MySQL database which is a fully managed database service that can be used to run native cloud services.

4 Result

Our platform is called CISNET (Campus Information System Network). It is a platform independent of universities or institutions. It includes professors, supervisors, teachers, and researchers who want to manage their courses and their students from different institutions. So, they create courses and give them codes through which they can register. It is also a platform for researchers who are looking for or want to share their research results, publications, scientific works. Our application is a dynamic website, it is accessible from a web browser and its code is hosted on a server. The application can be accessed via the URL https://cisnet.online.

Until now, 5 teachers and more than 500 students use the system regularly in 3 universities namely the University of Kinshasa, the Protestant university in Congo (UPC) and the Pan-African University of Governance and Innovation (UPGI).

4.1 Home page

This is the first page that any visitor will see when they first use the site. There is a presentation of what the platform does, as well as the different menus, and the connect button.
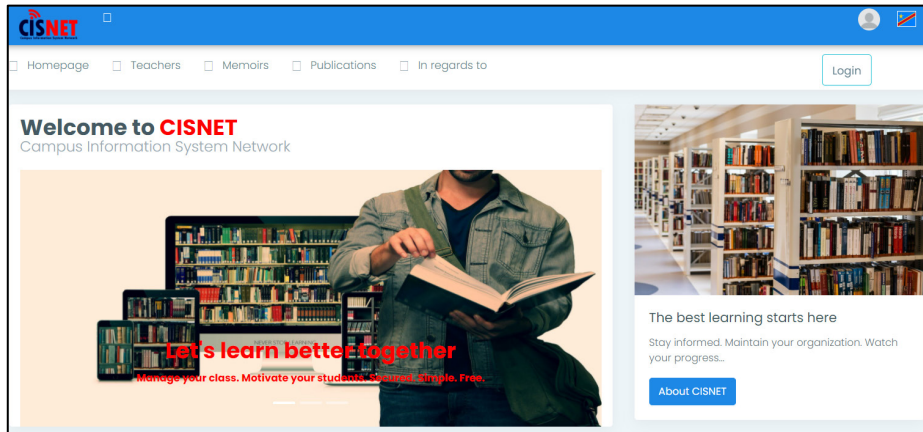

Fig. 5. Home page of the proposed system

4.2 Login page

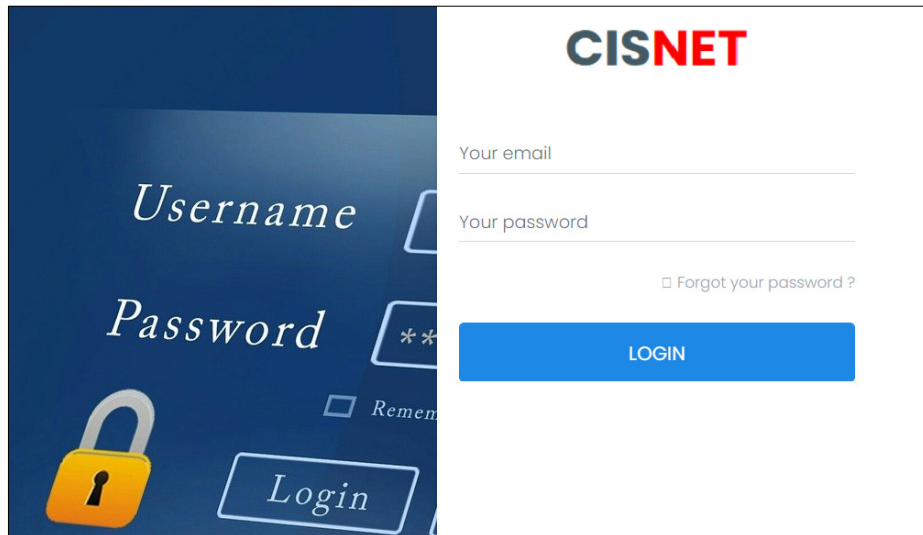To connect to the system, users must provide their password and login.

Fig. 6. Login form of the proposed system

4.3 Teachers or Professors list

This interface shows us the different teachers who use our platform and a small summary presenting them. You can see that there are not only teachers but also supervisors or assistants who may prefer.
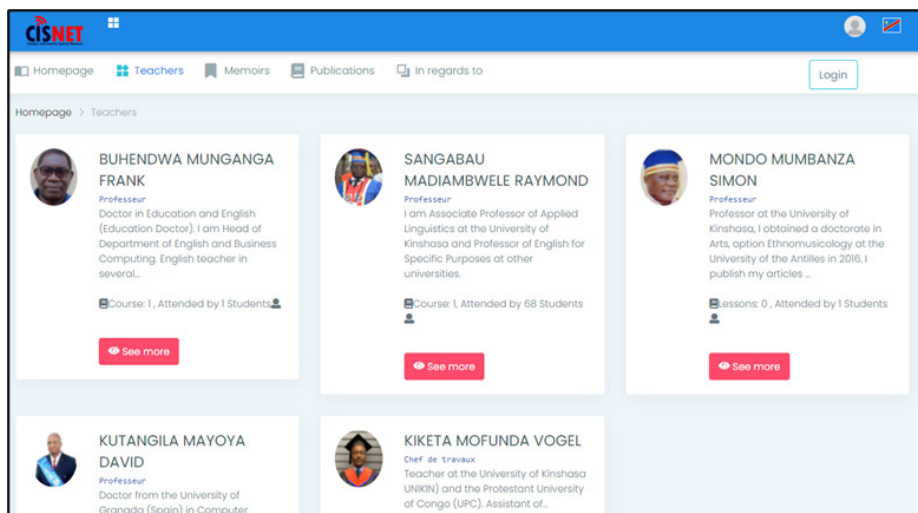
Fig. 7. Teachers or Professors list

4.4 Teacher or Professors presentation page

By clicking on a teacher in the list, you will see his/her presentation, research field, publications, scientific works he/she has supervised and the possibility to register to his/her courses.
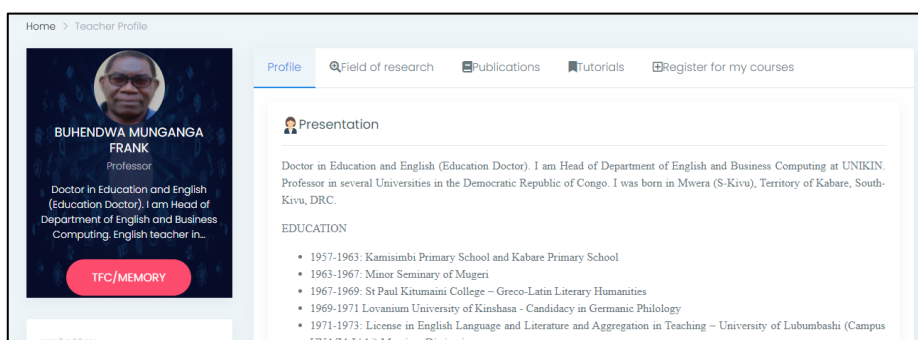
Fig. 8. Professors presentation page

The red button thesis displays the following form that allows you to send a request for thesis advising.

Fig. 9. Request for thesis advising

4.5 Registration to a professor's course

Lorsque l'étudiant clique sur le bouton d'inscription à mes cours pour un instructeur, vous verrez apparaître ce formulaire pour l'étudiant qui n'a pas encore de compte. Il comprend à la fois le formulaire de création de compte et le formulaire d'inscription. Pour ceux qui sont déjà connectés à leur compte, il n'y a que les trois premiers champs. Ils choisissent leur université, et tous les cours de cette université apparaissent, de là ils choisissent les cours auxquels ils veulent s'inscrire et pour éviter les non-étudiants, ils doivent donner le code que le professeur leur aura donné au préalable.

Fig. 10. Registration to a professor's course

4.6   Student dashboard

In the dashboard of a student registered on the platform, there is:- The presentation of his teacher;- The schedule of the scheduled courses;- The list of the active courses in which he is registered;- The current assignments, that is to say those whose deadline has not yet passed. The list of active courses in which the student is enrolled;- Current assignments, i.e., those whose deadline has not yet expired; here, the mention ; - "Not sent" reminds us that the student has not yet handed in his work;- The direction menu of the final work, because if it is supervised by a teacher.

Fig. 11. Student dashboard
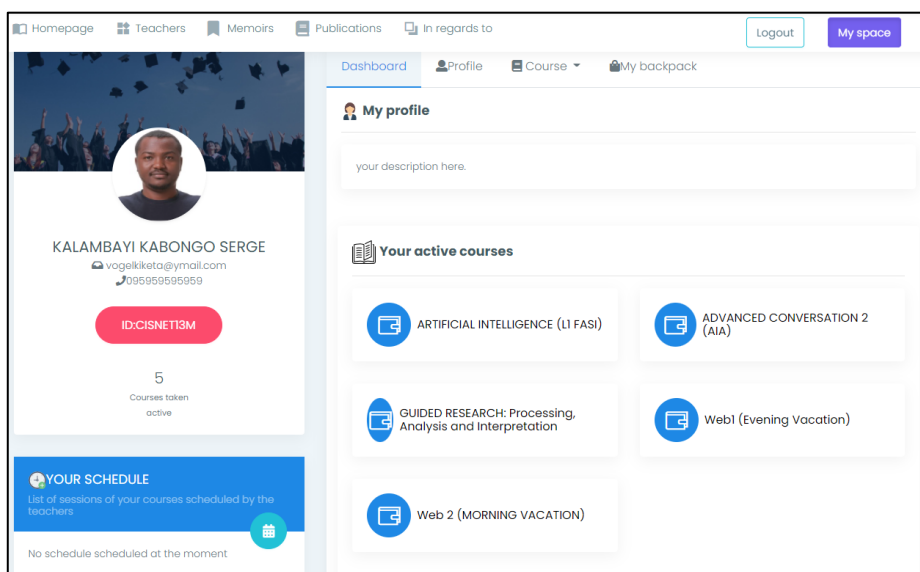
4.7   Student dashboard

In the dashboard of the teacher registered in the platform, we find the number of his active courses, his publications, the number of students he teaches and supervises, the total number of assignments in progress. Further down, you will find the course sessions he/she has scheduled, the details of the work in progress, as well as the list of active courses.
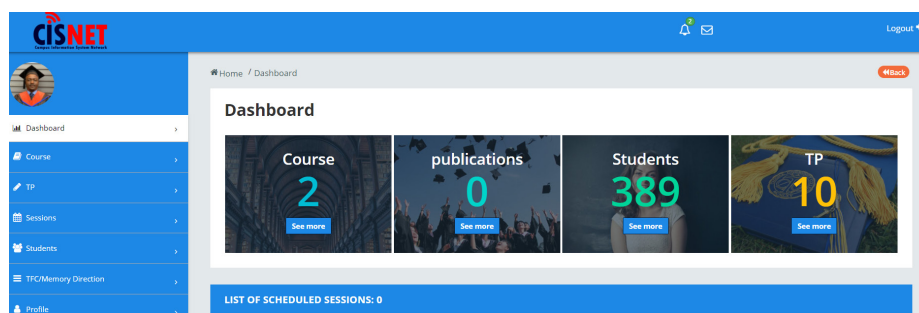
Fig. 12. Teacher dashboard

For more information on the features of the application, you must create your teacher and student account via the link https://cisnet.online.

5 Discussion

This work is a great contribution and innovative dimension on the implementation of an ICT-based system adapted to higher education in the Democratic Republic of Congo.

5.1 Implementation of a custom designed system

The proposed system is not copied from another pre-existing or even foreign system. On the contrary, starting from scratch, from a detailed analysis, we have replicated and digitized the current operating model of teaching in higher education in the DRC. Thus, the functionalities that we had to implement such as the supervision of the final term paper or thesis online, quizzes with different series, introduction of claims after publication of results, and many others are specific to our system, and are rare to find in popular LMS like Moodle, Google School.

5.2 The implementation of the flipped classroom concept in Congolese higher education

One of the solutions we had to mention was that the materials and all the media of the course are published by the teachers on the online platform so that the students already know about them, so that in the in the classroom it is either for further explanations, exchanges, discussion, and interactions.

This is a simple inversion of the traditional pedagogical approach where class time (group learning) is followed by homework or assignments (individual learning). In the flipped classroom, students are first introduced to a new topic individually at home through online videos and supporting content and media, and then they are invited to apply their knowledge in class and to go deeper into the topic through discussion, problem solving and group work under the guidance of the teacher.

The benefits of this approach are multiple: -Teachers spend less time introducing new topics; -Students develop independent learning skills; -Students will avoid absences because the attendance list is done on the platform; -Teachers can reuse the content they create; -Students find the time spent in class more interesting.

5.3 Flexibility

The system we propose is extremely flexible. Indeed, although we offer several features as mentioned above, each teacher is free to use or select those to which he can easily adapt himself and his students and integrate it into his operating model without much adjustment. Let us illustrate this with some examples: We have proposed that the evaluations or grading be done on the platform as well as the final calculation of the average and publication of the results. However, we still give teachers the possibility to print the results in pdf or Excel format in case they prefer to calculate the average themselves, edit, or publish outside the platform. Similarly, if a teacher finds that the internet connection is not reliable enough for online testing, he or she can do it out of the system and publish the results online. They can then add the results of this test to the overall average calculation offered by the system. Teachers who do not wish to redesign their courses into modules can simply upload their syllabus in one file. Our main goal is to allow the different actors to integrate technology into teaching at their own pace and to become familiar with it.

5.4 Better management of evaluations

We have proposed that practical assessments be done on the platform, they can be done synchronously (in the classroom the teacher publishes an assignment, and the students answer it on the platform) or asynchronously (the students submit the assignment later).

The advantages of this system are as follows: -No more problems with deciphering students handwriting; -Possibility of using plagiarism detection software; -Benefit of auto-correction for single choice, multiple choice, fill in the blank, etc.; -Elimination of printing costs and paper purchases; -Possibility of incorporating technological tools, and media.

5.5 Better student engagement and interaction with teachers

In the current higher education system, students are not very close to their teachers. Their class leaders serve as a bridge. With our system, the student can see the teacher's observations of them, their attendance statistics, and be notified directly of all course events. This increases engagement.

In addition, there is often a sloppiness in the submission of assignments because it is known that the head of the class will wait until the majority has submitted. With this system, the student knows that at the deadline, the system blocks and there will be no way to submit his work. He will therefore face his responsibilities. To submit their

work, students no longer must go to the office and ask if their work has been properly introduced by their class president, they do it directly.

6   Conclusion

In approaching this research, our concern focused mainly on the issue of the best strategy for integrating e-learning in the Democratic Republic of Congo, given the limitations and inability of the current system to function in a context where the face-to-face learning system is no longer a fact, because of the many confinements and social distancing due to the emergence of the Covid-19. In view of the realities inherent to our country, low rate of electrification, poor quality internet connection and the low experience of the concerned actors with Information and Communication Technologies, we have proposed the implementation of blended learning integrating the efficiency and the possibilities of socialization of the traditional classroom with the digitally enhanced learning possibilities of the online mode. To do this we have in this paper proceeded to the analysis of the current mode of operation of higher education and we have proceeded to the design and implementation of a platform specially designed to adapt to the current model of learning of the higher level of education of the Democratic Republic of Congo. This system has for contribution to familiarize the various actors with the ICT, to increase the engagement and the interaction between students and teachers, to digitize a good number of the manual tasks such as the management of students' attendance, evaluations.

7   Acknowledgment

8   References

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