

# Eliminate the Delay Backlog in the Conduct of Pedagogical Activities by Distance Learning

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**Abstract.** In large classes of enrolled students, Polytechnic University of Bobo Dioulasso (PUB) can not complete one academic year in 12 months. The major obstacle is the lack of infrastructure and qualified local teachers for conducting parallel coaching tutorial groups. These tutorials are carried out in group of up to 50 students. The academic year can last 18 or 24 months. To address this problem, we propose a techno-pedagogical system.

Technically, this project consists in strengthening the capacities of the PUB in IT resources and optimizing their use. A Learning Management System (LMS) is implemented on the local network. The campus network, accessible from all sites of the PUB and student residences, allows access to the server at a rate of at least 10Mbps. The LMS is also available on the Internet. On the pedagogical and organizational level, we conducted training for content experts and tutors in design and modular structure of courses, tutoring in distance learning. A team of two techno-pedagogues are empowered to manage this training system. Theoretical courses are run-face. Group works are driven remotely with the help of remote experts. This project would enable, in two years, to reduce the duration of an academic year to 12 months.

**Keywords:** Elearning · Pedagogic model · Context of teacher inadequacy · Context of infrastructure inadequacy

## 1 Introduction

Elearning is intended as an opportunity to learn anytime, anywhere. Until the beginning of the 21st century, it is a luxury for countries south of the Sahara because of poor integration of ICT in education, lack of financial resources to acquire computer equipment and low bandwidth access to remote resources. But in recent years, with the increase in computing power of electronic gadgets (smartphone, tablet, laptop) and a reduction in their cost, elearning is accessible by these low-income countries. It is a strategic challenge to up for lost time on the rest of the other continents in the field of education with modest financial resources. For five years the Polytechnic University of

Bobo Dioulasso (PUB) knows and accumulated delays in the conduct of academic years. In particular, promotions with large number of students can not complete two semesters in 12 months. Thus, the time it takes to pass for obtaining the bachelor's degree reached or even exceed five years. This is mainly due to lack of infrastructure and teachers to animate in parallel several tutorial groups or practical work. In this paper, we show that elearning may be a solution for this problem. After a preliminary study that allowed us to analyze the opportunity, relevance and feasibility of this training approach for this university, we propose a techno-pedagogical system as a solution to this problem. Our solution is expected to achieve the skills sought without important investment cost and reduce the academic year to 12 months in all these promotions with large numbers of students. In the remainder of this paper, we present in Sect. 2 related work. In Sect. 2, we present a diagnosis of human and material resources. In Sect. 3, we present the design of the project. Section 4 discusses the implementation of the system and tests. Finally, in Sect. 5, we present the conclusion and perspectives.

## 2 Related Work

For the design of this project, we studied the experience of a number of universities and training centers [Luz07] and training models of a number of experts in the elearning domain. We focus on contexts that are similar to ours marked by large number of students per class, deficiency of classrooms, deficiency of teachers.

Author in [Wil09] discusses the initiatives that Tanzania has taken to expand educational opportunities at various levels using open and distance learning (ODL) approaches. He made proposal of how to improve both access and the quality of education using emerging educational technologies.

[SL08] focuses on the progress and challenges currently facing Zambia for the implementation of the Right to Education and the role of open and distance learning in addressing those challenges.

Julien Deceuninc establishes similarities between distance teaching for great masses and shared teaching in the early nineteenth century. The shared teaching was as motivating idea: "extend the benefits of education, shorten the difficulties, reduce expenditures" [Lab18]. This form of training suitable for large numbers of learners is characterized by the standardization of educational resources and a low quality coaching which use is made of monitors [Dec07].

Jean-Marie Muhirwa in [Muh08] presents the causes of poor performance of elearning projects in South-Saharan Africa. The author challenges poor needs analysis that failed to take seriously the impact of socio-economic and technological environment particular to developing countries and from the perennial inconsistencies of foreign aid.

Authors in [ZZC12] conducted an exploratory study on the application of e-learning standards. This standardization contributes to improving the quality of distance training offers. They focused on the description and referencing of educational resources and on the development of a standardized and interoperable learning profile adapted to the context of their university. They provide an application profile based on

the Metadata for Learning Resources (MLR) allowing a standardized description and setting up a repository of interoperable educational resources.

### 3 The Design of the Project

To address this lack of infrastructure and permanent teachers, we propose a semi-face training for these large classes. This project concerns particularly six classes with at least 1,200 students in the domains of economics and management sciences and in the field of political and legal sciences.

#### **Pedagogical Model**

Educational resources and adequately developed learning activities are uploaded in a Learning Management System (LMS). Synchronous and asynchronous exchanges spaces are created on the virtual campus. The lectures are given in-face by the classroom teacher of the course. The tutorials are administered remotely through the LMS. These occupy more than 9/10 of the total volume of hours of supervision. This work is conducted in small groups of up to 50 learners. This last phase of training allows learners to be more in touch with the coaches and facilitates an individualized monitoring. The intervention of foreign supervisors in training animation will address the deficiency of permanent teachers. This method of training brings the benefits of classroom teaching and distance tutored teaching. Our large groups of learners training model promotes the division of labor. We distinguish content experts, mentors or instructors, technical tutors. Training modules are developed for these first two groups. A number of tutors and content experts are already formed. The LMS Moodle [moo] we offer, tolerates this proposed educational organization. It puts in scene this division for example by separating documents, activities and work performed by the students. This model is also characterized by promoting peer learning. Thus, each section or important concept is associated with a discussion forum. In order to compel in quantity and quality the participation of all learners, interventions in these exchange spaces are assessed. Group activities are systematically implemented in each module. Thus, inspired by the model of Deceuninck [Dec07], with peer learning we are contributing to reduce the coaching cost by making the learner a skill transfer agent. In this social information context where knowledge is decentralized, the only concern about the effectiveness of this model is the ease Internet access. Distance synchronous meetings are held one session for the equivalent of ten hours of lessons given in-face. The other types of activities (glossary, wiki, etc.) are implemented according to the module taught and the objectives sought. Moodle platform we offer is suitable for the implementation of socio-constructivist pedagogical approach. However, note that we disagree with the concept of assigning artifacts a learning theory in a techno-centrist drift [PARS].

#### **IT Infrastructure**

The IT infrastructure is one of the cornerstones of this project. The university already has a local network that allows accessibility of the server hosting the LMS with a minimum rate of 10 Mbps from all university sites and student residencee. This network also facilitates the use of VoIP tools for oral communication. Teachers already have laptops. Half of students have electronic devices to interact efficiently with the

server. They have also at their disposal the computer rooms during periods not covered by the face training. They also have permanent access to a multimedia room of 100 machines in student residences. We have three videoconference rooms with a capacity of 100 persons that could be used for teachers who would like to make synchronous distance presentations. Internet access with a throughput of 10 Mbps is provided for this purpose.

The project has a number of strengths. Among others, we can mention a high motivation of the first university officials, the project concerns a rather theoretical training there is no practical work, a high quality techno-pedagogue team.

## **4 Implementation of the Project**

The preliminary work of the project was a feasibility study. We conducted surveys by various means (interviews, questionnaires, data consultation, etc.) to ensure the opportunity, relevance, feasibility (technical, organizational, temporal and financial feasibility) for this project. The various actors involved in the project (university officials, teachers, students, technical support staff) were questioned. After being convinced of the relevance of the project, we proceeded to the implementation of distance learning platform. Our choice fell on Moodle for accessibility of its source code, its modularity, its adaptability to different contexts. Once installed and customized Moodle locally, we proceeded to the development of a security policy for the server room hosting the LMS and different needed services on this server. Guided by the survey results, we have prepared and hosted a number of formations. This includes design and modular structuration of course for distance learning, mentoring and mediation in distance learning context, taking control of the Moodle platform, distance learning management. Subsequently, we proceeded to the implementation of the management team of this semi-face learning. This team is composed of two experts in e-learning domain, two computer technicians, education officer and heads of schools involved in the project. Charters have been drawn up for students and teachers. A motivating financial model was proposed to teachers. Finally, we conducted tests to ensure that teachers and the IT infrastructure are ready for the start of this e-learning the next academic year.

## **5 Conclusion**

We are seeking short-term to reduce the delay in the conduct of pedagogic activities in Polytechnic University of Bobo Dioulasso. The Learning Management System Moodle is implemented. Teachers are trained in conception and modular structuration of courses and tutoring in distance learning. The concerned formations primarily responsible are trained in the e-learning management. A management team comprised of elearning pedagogy specialists and computer engineers respectively ensure the pedagogic and technical aspects of the proposed semi-face learning. This project will solve problems of lack of infrastructure (classrooms deficiency) and teachers for

promotion with large numbers of students. It should permit, in two years, to bring back the academic year to 12 months in all promotions.

The deployment of this techno-pedagogical system is an innovation for our university. In medium term:

- It will facilitate the promotion of new educational approaches. Instead of the learner in the learning and peer learning through the forums and chat rooms associated with the learning units will be greater.
- allow the intervention (distance) of foreign experts and business professionals in our teachings.
- It will allow the development of curricula where lack of local specialists. Foreign experts be able to intervene through distance learning via this platform.
- It will reduce the very budget-Educational Missions (purchasing airfare, living expenses, insurance costs).

As another research perspective, in a mobile learning philosophy, we plan to modify the LMS Moodle by applying mobile development techniques and removing superfluous services.

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