

Feasibility of interconnecting the University of Bangui and peripheral areas via the TVWS for e-learning in the context of COVID-19

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Abstract— The campuses and classrooms of the University of Bangui do not have connectivity due to insufficient network infrastructure. However, there are Dynamic Spectrum Access technologies in the unused VHF and UHF analog TV band called TV White Space that can be used to provide high-speed Wi-Fi access over wide coverage and at lower cost. Since March 2020, courses have been suspended at the University of Bangui to effectively limit and combat the COVID-19 pandemic. After a three-month period of containment, academic activities have resumed. The increase in the number of cases of COVID-19 contamination raises concerns about this resumption. Given the rules of social distancing that limit the number of students in classrooms, the risks of travelling by public transport and the lack of motivation of some students following years of war, the University of Bangui can organize distance learning as a transitional measure.

This paper is the subject of a feasibility study on the interconnection of surrounding neighborhoods and villages by TV White Space at the University of Bangui that can accommodate students and teachers for distance learning courses in the context of COVID-19.

The methodological approach consists in studying the deployment of a White Space TV network to interconnect the peripheral areas at the University of Bangui, then using the Moodle distance learning platform on which we integrate the virtual classroom plugin, deployed locally and running without Internet connectivity. The bandwidth of the White Space TV will be important to practice the educational activities without spending money to pay the Internet credits of the operators' networks. Students can connect locally via Wi-Fi in the areas covered by the platform and follow the different academic activities according to their geographical location, while others closer to the university can go to the classroom to attend classes with the professor in the rules enacted for protection against COVID-19.

Our solution initially helps to break the digital divide and then to promote e-learning at the University of Bangui in the context of COVID-19.

Keyword— COVID-19, interconnection, TVWS, e-learning, Moodle, virtual classroom



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