

ABSTRACT

Digitizing education is an effort made in the realm of education by utilizing information and communication technology (ICT) developments to facilitate the teaching and learning process. In this case, the method commonly used is blended learning, which is learning that is carried out in class or online with the help of a learning management system so that teaching and learning activities do not need to be carried out face-to-face every day. But unfortunately, this has not been implemented optimally, especially in rural areas with limited resources.

To overcome this problem, we designed a solution by proposing the construction of a low-power and portable micro cluster server infrastructure that has resource servers capable of running learning management systems (LMS) optimally. The micro cluster server that we created consists of 3 nodes of Raspberry Pi 4 Model B which are made into one server cluster. The purpose of this research is to prove that the micro cluster server infrastructure that we have created can run the learning management system application optimally to help digitize education in rural areas even with limited resources.

The results obtained from testing the micro cluster server infrastructure system that we made show that the performance of a micro cluster server with 3 nodes using a Raspberry Pi 4 Model B can meet the low power criteria with a percentage of 68.5% more efficiently than the mini-pc Intel NUC cluster. Also, in terms of portability, the micro cluster server it's 41.7% lighter than the mini-pc Intel NUC cluster. Also, with the configuration that we make, the micro cluster server can provide optimal performance to run Learning Management System applications even with limited resources.

Keywords: digitization of education, learning management system, rural areas, micro cluster server infrastructure, performance micro cluster server