

Graasp Desktop: Supporting Digital Education in Underconnected Schools in Africa

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Abstract: Over the past three years, the Go-Lab Goes Africa (GO-GA) initiative has focused on promoting and implementing digital education in Africa. GO-GA is an innovation action supported by the European Commission through its Horizon 2020 Framework. One of the outcomes of this initiative is *Graasp Desktop*, an open-source, customizable, cross-platform desktop application aimed at delivering technology-enhanced learning to schools where internet connectivity is limited or inexistent. A mixed-method requirements elicitation process was conducted in three pilot countries—Benin, Kenya and Nigeria—comprising surveys with 109 teachers, as well as 14 school visits that included interviews with principals, teachers and personnel in charge of technology infrastructure. Key findings showed that (i) schools had unreliable internet connectivity, with approximately 27% of respondents reporting not having internet access at school and field visits revealing functional connections in only six schools; and (ii) students worked mostly on shared desktop devices, with 42% of respondents reporting that students worked in groups of five or more per device. Graasp Desktop’s design and software architecture are based on these findings, supporting multi-user offline use and dissemination of open educational resources. Conceived to be future-proof, Graasp Desktop seamlessly transitions between online and offline contexts. When connected, it allows teachers to explore, preview and download *learning capsules*, which are educational resources comprising digital activities—such as virtual labs—that can be contextualized with text, images, and other interactive content. Once downloaded, teachers can make use of learning capsules and share them with their students without the need of an internet connection. Furthermore, Graasp Desktop can record learning analytics, allowing (i) students to reflect on their learning, (ii) teachers to visualize and get insight into the offline activity of both individual students and entire cohorts, and (iii) researchers to conduct studies with data obtained in underconnected schools.

Keywords: digital education, underconnected schools, open educational resources, offline