

## E-learning courses made in West Africa, for African youth

For most young people, getting information via the Internet is part of the daily routine. But who can guarantee that such information is of high quality, trustworthy and useable? Our authors describe how they use the Moodle e-learning platform for development, deployment and management of e-learning courses for vocational training of African youth in agriculture and agro-business.

While agriculture is expected to produce more food and create more employment in Africa, a large pool of young people are struggling to find employment and are often tempted to leave rural areas and agriculture. Of course this situation has many causes, and it is not our endeavour to solve them all ... but we do want to solve one set of issues that lock a large group of youth out of employment in agriculture: traditional teaching and curricula are not always well adapted to the reality of day-to-day farming. Through under-funding of the education system, agricultural teaching is all too often done in an old-fashioned, top-down manner, centred on unaffordable technological solutions that are not appropriate to the environment, by too few teachers who are markedly underpaid and often under-trained. Agricultural colleges lack the funds to update curricula, invest in teaching resources and even hire enough qualified teachers. Also, agricultural research organisations often lack incentives, opportunities or interest in transferring the results of their research into teaching and training material.

Providing free online courses that are of good quality as far as their tech-

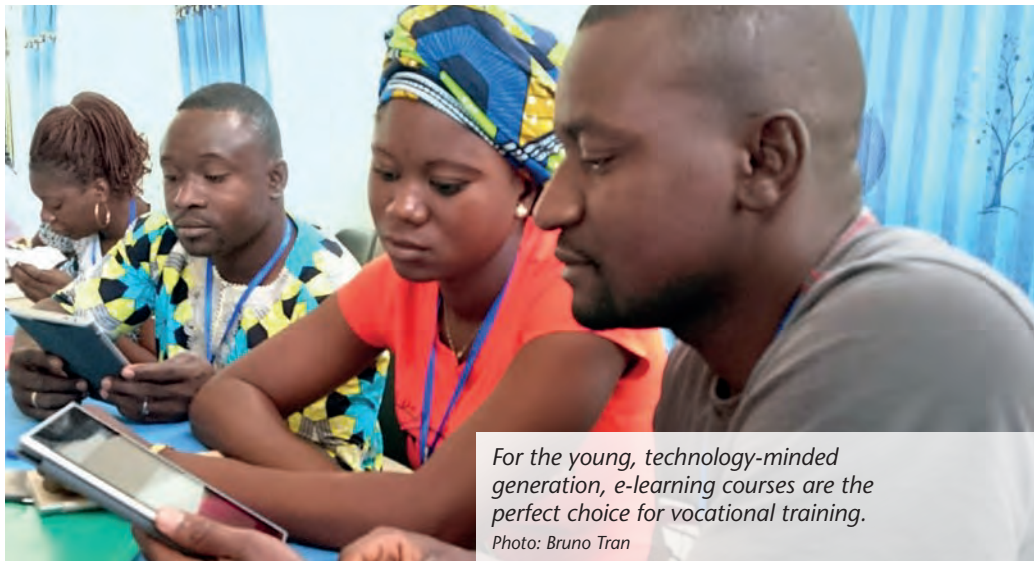
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*For the young, technology-minded generation, e-learning courses are the perfect choice for vocational training.*

*Photo: Bruno Tran*

nical content is concerned as well as being attractive and easy to use from their format can reach a young audience via the Internet in ways and at a scale that no other teaching format can. From cybercafés to hotspots and personal data plans, Internet access is going through a fast revolution, coming with a high level of interest from young people who belong to the first generation finding information on YouTube or Google as easily, or even more easily, than in any other traditional way. Although there are large variations between countries, urban youth is certainly at the forefront of this Internet revolution in Africa.

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### ■ About us and our target group

We are a small team within the Knowledge Management unit of AfricaRice – the CGIAR Centre for rice research and development in Africa – and AKM-Services, an ethical consul-

tancy firm from Germany specialising in IT support for the agricultural development sector. Since 2016, we have developed and offered e-learning courses on basic agriculture – production and transformation, business development and extension skills – to an audience of young people who know little about agriculture, are comfortable with using ICTs and the Internet and want to develop their skills in agriculture and agri-business.

In our current projects, funded by Germany's GIZ, we offer these courses to young people in Benin who have completed an agricultural technical course and whom we have recruited to work alongside national agricultural support services with farmers' groups, to disseminate agricultural innovations. We cover several value chains of importance to farmers in West Africa, starting with rice, maize, soya, groundnut, cassava, shea nut, cashew nut, palm oil and poultry.

## ■ Content: quality counts

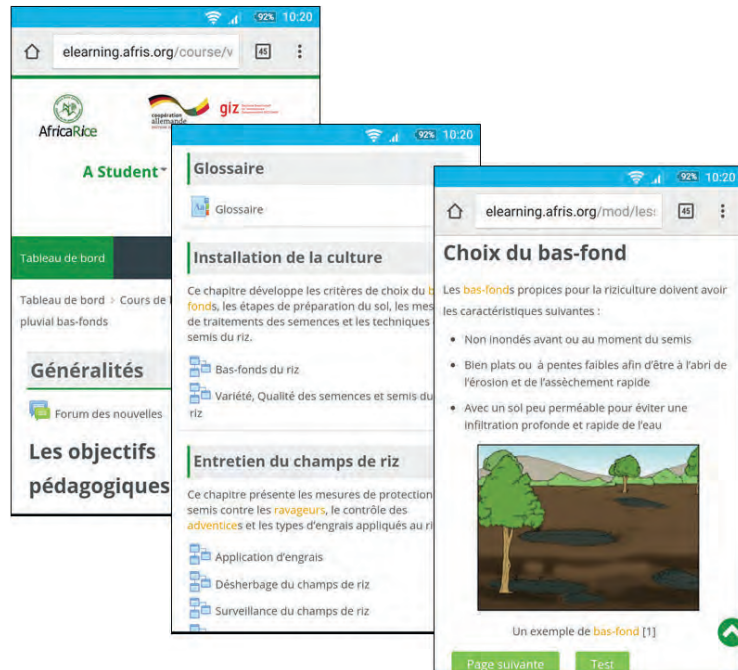
It is crucial that the scientific and technical content of agricultural training courses be vetted for its accuracy and its appropriateness to agro-ecological zones, climates and agronomic situations. Also, it must have been tested for and adapted to farmers' needs, constraints and preferences. Lastly, training courses must also comply with and reinforce national recommendations and complement the country's extension services' message.

In order to ensure high quality scientific and technical content that is appropriate to the reality of farming in-country, we work with agricultural experts from the National Agricultural Research Systems (NARS) as well as scientists from international institutions. We have found in particular that recently retired NARS scientists are available, are willing to use their vast knowledge and experience of agriculture, and constitute an ideal pool of experts on which to call for sourcing appropriate material, advising on course content and reviewing course material from a scientific and technical standpoint but also in terms of appropriateness.

## ■ Easy to use

The high quality material is then packaged in an attractive, simple and logical format in order to make it easy to use by our intended audience. We pay particular attention to the language, which must be simple but specific. The number of technical words is limited to a strict minimum, and they are defined in an interactive glossary in each course.

Courses are designed to be studied in 30 minutes to one hour. They are divided into chapters, themselves subdivided into sections. Each section is made of a few pages, each page consists of a short text and a visual aid – a photo or a cartoon. Ideally, one simple concept is covered by one page. A page also contains navigation buttons for within-section navigation, but a navigation panel is always available



and allows chapter- or course-level navigation (see screenshots above).

Each section ends with a short formative test which helps students verify their learning. An erroneous response results in the question being asked again and a chance to review the material if so desired. At the end of the course, there is a summative test that covers the full course content, where students are given only one chance to answer each question. They are then given a mark for the overall test; a pass mark results in a course certificate being awarded automatically. Students can retake the course – and therefore the final test – as many times as they want. The content of the course is available to download as a PDF file for later reference or for use when working with farmers groups.

## ■ Technological foundations

The collaborative approach to planning and writing the course material takes place within the Extranet used by AfricaRice's Knowledge Management Unit, which is designed for collaborative work on documents, sharing and archiving. When the implementation of the e-learning courses started, the required IT infrastructure for the course preparation was already in place and established. The Extranet mainly con-

sists of the following IT components: a) an enterprise wiki (Confluence by Atlassian), and b) a task management system (JIRA by Atlassian).

AfricaRice has been using Atlassian software successfully for a number of years now, enabled by their community programme which grants unlimited licenses to not-for-profit NGOs and open source software projects, with a saving of tens of thousands of dollars of licensing costs each year. The Extranet is hosted on multiple virtual hosts in a data centre in Germany to provide a secure and robust environment.

The e-learning platform chosen for this project is the free and open source software Moodle by Moodle HQ PTY Ltd. The software is written in PHP, the most widespread cross-platform framework to develop dynamic web applications. Like the Extranet, Moodle is hosted on a virtual server in a data centre in Germany. The currently active number of about 550 students accessing the platform places only modest demands on the server infrastructure and does not require more advanced setups that may be needed in the future, such as a load-balanced installation.

To change the visual appearance and better support mobile end-user

### How courses are developed

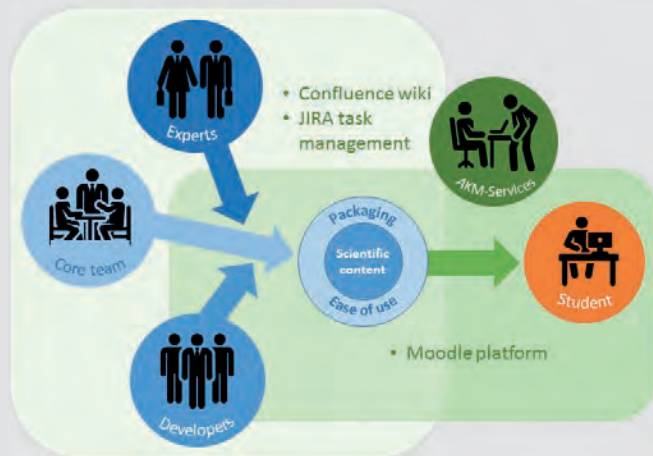


Diagram: Bruno Tran  
Icons made by Freepik from www.flaticon.com

To develop our e-learning courses, the core team decides the curriculum and manages a group of experts, and a team of course developers. The experts advise on the curriculum and locate or develop the scientific or technical material used to develop the course. If needed, the experts simplify the material, or source additional material.

The course developers re-package the material in short and simple pages, aggregated in sections and in chapters with a logical flow. The core team reviews this work iteratively until the structure is ready. Course developers, experts and the core team ensure that the language is simple but precise. Course developers design the formative tests and the final, summative test. They also source visual aids when they are not available, or insufficiently so, in the original material. They then transfer the course material in the Moodle platform, create the tests and their logical flow and set the course's parameters. Once finalised, after a last review cycle, a course is made available to students on the web platform: the course is live.

devices, a commercial styling (also known as a theme) was purchased at minimal cost and installed. Today there is a large marketplace for ready-made themes for a range of platforms that provide modern, stylish and customisable web designs for a shoe-string budget.

#### ■ Keeping access as simple as possible

Our Moodle platform is available on any modern Internet browser, and as we have kept the course interface simple and clean, it is not particularly demanding in terms of bandwidth, especially compared with video-based online courses. Internet access is required for studying our courses, and this can be achieved via a good cyber-café's network in-country, emerging Wi-Fi hotspots and, more and more importantly, personal mobile data plans. In addition, within our projects, we have rolled out a network of over 20 dedicated offices across the country, where, amongst other services like access to agricultural knowledge archives, meeting of colleagues or of more experienced field agents, our students can use a reliable, free, Wi-Fi connection and even a couple of laptops.

But in order to offer the most flexible and adapted access to our e-learning courses, we have equipped the

young people with whom we work – 124 of them this year – with cheap, locally sourced Android tablets. They can currently use the browser on the tablets to study our courses, but the next release of the Moodle Mobile app for Android is due to offer the ability to download a course and study it offline, which is expected to be of great appeal to our target audience. In preparation for this, our courses were designed to be well adapted to small screens, and responsive to touchscreens.

#### ■ Sustainability and scaling up

To maintain a good level of control on student access, we decided to automate the course flow and management of certificates but not the original registration of students. We can, for example, allocate students to cohorts for later reporting of progress for specific groups. The platform's database of students and courses management can be interrogated by the core team using SQL queries coded by AKM-Services, which means that reporting on access, usage, progress and success is easily achieved.

We believe that our courses, supported by the systems we use, offer the sort of vocational training in agriculture and agricultural entrepreneurship that the African youth need to complement their formal teaching and better prepare them to take their place in African agriculture. Our course development and management model was designed to be up-scaled, and we carefully record everything we do so that our approach is easily replicable. Such an approach can be used for other domains such as health, nutrition or citizenship development.

Our projects are currently based in Benin, West Africa, and therefore, our courses are offered in French. But we are starting to translate our courses into English and aim to eventually offer all courses in both French and English, with dedicated bilingual course and student management

Updates from Moodle upgrade both course developers' and students' experience, and we are adding new courses to our portfolio on a regular basis.

For more information on Moodle, see online version of this article.

The e-learning platform is at ► <http://elearning.afris.org>, and if you want to try it, just request a test login on [elearning@afris.org](mailto:elearning@afris.org).

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