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for social development

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1. SUMMARY

This report presents a description of the second training course done for the mobile training lab during the months between April and May 2013. This deliverable reports on the activities performed during task 6.3 (training sessions) of the project.

In summary, the second cycle of training has been successfully concluded, with a series of experimentations of the planning and delivery methods of the training, following feedback on the first training and in order to facilitate the sustainability of the business model. Two major training sessions comprise this cycle:

- A blended (online plus face-to-face) full-curriculum training session has been completed by 11 participants in the time frame scheduled. Access to online self-training resources is constant and is one of the legacies of the project.
- On top of that, modules of the training have been 'plugged-in' existing courses organised by a local training centre (Coders4Africa), thus extending the number of beneficiaries of the initiatives for crucial components of the training, such as for the User Experience and Business Model modules. 20 participants have successfully completed the course.

The syllabus of the training course was initially based on what had been identified in Deliverable D6.2 and D6.3 (training materials). During the planning and delivery of this cycle of training we have significantly changed the training materials, in order to strengthen the possibility for online self-training. Discussion and details on the new version of the training materials – as well as access to the training materials themselves – is available in the Deliverable D6.4 (Training materials final release).

Key outcomes of the second cycle of training can be summarised as follows:

- The integration of modules into selected 3rd party trainings has demonstrated its value and has proven beneficial and cost-effective;
- The delegation of full-curriculum training to local organisations has been less successful, due to a mix of coordination issues and lack of involvement of other organisations in the ecosystem;
- The use of an online platform seems to have been appreciated; however, it generates issues of engagement, given its relative novelty.

This report builds on top of what had been delivered in D6.5. Additional inputs arrive from what has been learnt in additional feedback sessions with local partners,

and from the different iterations of the Business plan (please view D6.9 – Business Plan final release – for a detailed description and recommendations).

After an introduction that summarises the goal and needs for the training (in chapters 2 and 3), the report provides the overview of the activities of the second training cycle. As it is going to be described in chapter4, 2 major activities constitute this second training cycle: on one side the organisation of a full-curriculum training cycle, done by local partners; on the other side the collaboration with an external organisation, delivering specific training modules to a class for a course organised by them, independently. Chapter 5 and 6 detail the planning, implementation and outcome of each of these 2 major activities. Chapter 7 gives details of the monitoring of the progress made, based on the requirements identified as well as the performance assessment of the lab activities. Finally (chapter 8), the report describes next steps needed to ensure continuity.

2. SCOPE OF WORK PACKAGE 6: MOBILE TRAINING LAB

The aim of the Work Package (WP) 6 is to setup a Mobile Training Lab in Senegal, to disseminate expertise on mobile technologies that are significant to the context. These will enable local entrepreneurs to launch new services, to provide locally relevant content and applications to the country and give them a stream of revenues. The technologies in scope for this WP include (but are not limited to) voice applications and web technologies that are accessible through a mobile. The training will focus, not only on the technology aspect, but also on the overall user experience of a service (how useful, usable and engaging it is for the possible users), business models and methodologies to deploy services. Much of the research coming from the Working Package 1, on how to build a sustainable business, will act as a basis for the practical activities on the field. This WP will also ensure the self-sustainability of the lab itself.

The global work plan of this WP is based on 3 phases in order to create a self-sustainable mobile training lab in Senegal. During the first phase, the WP has identified the requirements in terms of training curriculum, and has organized a first selection of entrepreneurs and has trained them in the first half of 2012. This first session has also included training of the trainers of the selected local partner, and the setup of online collaboration tools to enable entrepreneurs to get support after the session, and to create a future community of training labs in the region. Then, a second training session has been organized by local partner and with European-based partners as virtual coordinators and observers. A blended training method has been selected, in order to facilitate replicability, make the participation requirements less rigid, as well as lowering long-term delivery costs. The last phase of this WP consists of the release of the training content as open-source material, the release of the setup methodology of the lab as well as the business plan, and the dissemination of the results of the experience to create a momentum on this concept, and enable other organizations from Senegal and other countries to establish new training labs.

3. TRAINING OVERVIEW

3.1. Training objective

In the past few years, we have assisted to an increasing importance of the digital economy in African societies: in particular, we have seen a significant penetration of mobile phones into people's lives. Mobile phones penetration is estimated to be at the 66% of Senegalese population, while Internet channel reaches approximately 15% of the population[1]. The sharp increase of fixed and mobile Internet data usage in the past decade (with only 1% of Senegalese population using Internet in 2001, according to ITU[2]) implies a growing attention, and it opens possibilities for local players to fill in the gaps of unmet needs. Use of Internet through mobile devices is increasing significantly; as the Senegalese Telecom Regulation Authority (ARTP) reported in 2012, "The popularity of mobile broadband internet in Senegal is growing quickly: the total was just 53,678 in June 2011, equivalent to 28.5% of the overall market, but had ballooned to account for 71.1% of the segment twelve months later."[3]

As thoroughly researched during the first phase of the project – and validated through the first training session in 2012 - the **objective of the training** is to build capacity on mobile and web service development for individuals and small groups, so that they will be in the position to meet the growing opportunities of the mobile and web industry in West Africa, and to produce their own relevant and sustainable services. This objective must not be limited to the cycles of training planned and organised during this WP: what has been created during the Mobile Training Lab project must be taken forward in ways that keep the training objective valid and at the same time fit in the local context.

3.2. Training requirements

In previous tasks of WP6 we had identified that - in order to realise the objective mentioned above - the training course would need to fulfil a series of requirements:

- The course has to offer training on mobile and web technologies, given the rates of adoption of these information and communication channels;

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[1] Data based on CIA WorldFactBook: https://www.cia.gov/library/publications/the-world-factbook/geos/sg.html

[2] http://www.internetworldstats.com/af/sn.htm

[3] Quote from ITU statistics newslog:

http://www.itu.int/ITU-D/ict/newslog/ARTP+Senegal+Mobile+Base+Topped+107m+Users+In+Mid2012.aspx

Original data source ARTP Senegal:

http://www.artpsenegal.net/telecharger/document_Tableau_de_bord_30_juin_2012_384.pdf

- The entire initiative must have a strong component of training and supporting voice technologies, given the prevalence in usage of voice channels, and the relatively high level of illiteracy in Senegal and West Africa (and considering the outline and purpose of the Voices project);

- The training should be modular, in order to facilitate participation, especially for people who have to fill in a small sub-selection of expertise gaps, compared to entire offering;

- The training should not be limited to technical topics, but include business innovation, management, design for start-ups and launching SMEs;

- The initiative should have a specific focus on the creation of applications, content and services that have a local impact, in order to fulfil the goal of stimulating the growth of the mobile and web ecosystem;

- The style and format of the training must be extremely practical, hands-on and project oriented, as it needs to bridge a highly theoretical education, usually offered in most Senegalese higher education institutes, with the practical needs of working on end-to-end projects (as it happens in start-ups);

- The entire initiative should facilitate strong connection with other realities in Senegal (Universities, incubators, acceleration spaces,…) and in the region (other labs in West Africa);

- The focus of the initiative should be in facilitating the creation of projects that could realistically become a mobile technology-oriented start-up;

- The initiative should benefit and help highlight successes and challenges of the other working packages of the VOICES project;

- The training should have a platform-agnostic approach, which will help participants to benefit from the most open and flexible platforms for their services.

These requirements have been identified, on the basis of:

- Experience gathered from other labs the members of the consortium are working with (Mobile Web Ghana, mLab East Africa);

- Requirements from Working Packages 1, 2, 4, 5 on the technologies that would be beneficial to their work;

- Needs discovered during our on-the-field research of potential trainees in Senegal (see deliverable 'D6.1 – Requirements' for more information on this aspect).

On top of these initial requirements, more have been identified as part of the feedback gathering exercise done throughout and at the end of the first cycle of training:

- The training must be able to support trainees who have slightly different expertise levels and learning paces, by providing space for self-training and review of the newly acquired capabilities;

- Time and place of delivery of the training must be as flexible as possible, as participants need to perform difficult balancing acts between the training times and their traditional schedule;

- Cost and complexity of the organisation and delivery of the training session must be reduced, in order to make it sustainable for local partners to carry the initiative forward.

4. ACTIVITIES OF THE SECOND TRAINING CYCLE

This chapter aims at outlining of the second cycle of the training. Due to the additional requirements (especially those related to the legacy of the project afterwards) and the need to validate some of the assumptions of the business model identified, we have organised a twofold set of activities within the second training cycle:

- **Full training, blended learning methods, localised responsibility**: this first set of activities builds on top of the first training session. It keeps the curriculum – as it was identified in the Deliverables D6.1, D6.2 and D6.5, and it changes the delivery method, by introducing a strong online component (and keeping the face-to-face moments for deepening certain topics and practical activities). This allows trainees to learn at their own pace, set-up their own schedule and to integrate it with external resources; at the same time it reduces the organisational costs needed for the training, and allows local organisers to take more responsibility over the course, which is one of the key requirements. This training session was organised in situ by consortium partners ESMT and the local office of W3C, and supported by the central coordination of W3C, PTIN and WF. This activity has been organised and delivered in order to validate a series of assumptions behind the methods and practices of the training. A blended (online plus face-to-face) full-curriculum training session has taken place between April and May 2013; it has been completed by 11 participants in the time frame scheduled. Access to online self-training resources is constant and is one of the legacies of the project.

- **Contribution to third-party trainings for specific competences**: we have started the integration of key modules of the training curriculum into training organised by locally-based third party trainings. In November 2012, we have contributed with the delivery of "User Experience" and "Business model innovation" modules to a face to face training session on mobile and web technical development, organised by Coders4Africa in Dakar. 20 participants have successfully completed the training, which is allowing them to create digital services for relevant companies. In this way, we have been able to strengthen a local organisation, and extend the number of beneficiaries of the initiative.

In the rest of the document we are going to highlight the organisational set-up and the planning of both these activities.

5. ACTIVITY 1: FULL-CURRICULUM BLENDED LEARNING TRAINING SESSION

In this chapter we describe the planning, implementation and outcome of the first of the activities included in the second cycle of the training session. As introduced in previous chapters, the training session has adopted a blended learning approach. *Blended Learning*[4] approaches stress the value added by creating learning environments that mix the extremes of four key dimensions: space (face-to-face VS remote); time (synchronous VS asynchronous); fidelity and media (multi-media VS single media); humanness (rich human interaction VS rich machine interaction). This modality has been decided as a consequence of the feedback received throughout the planning and implementation of the first training cycle.

5.1.   Planning

The planning phase consisted of two major tasks. First we had to highlight what were the major assumptions that we really needed to test in the new format. Taken from a 'lean start-up approach', the principle of validated learning[5] guided the first planning steps. The second task was to review the organisational set-up of the training course, in terms of ownership of activities, format of the training, schedule and logistics. Within this task we also worked on the creation of tools and platforms, and we went through another review of content. The rest of the paragraph describes the details of these 2 main tasks.

5.1.1. Key assumptions

Given the evolution of the modality of training towards one based on the Blended Learning approach, and the evolution in business model (see deliverable D6.9 for details), this activity had the goal of validating a series of assumptions. Among the most important ones:

- That the basic structure of the course as organised in the first course allows a good preparation for participants. This assumption was based on feedback on the first training;
- That participants on training courses would appreciate to manage their timing and schedule up to a point: leaving them completely independent and do not provide milestones and checkpoints would hinder the momentum;

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[4] For an introduction on Blended Learning, see: C J Bonk, C R Graham, *The Handbook of Blended Learning: Global Perspectives, Local Designs*, San Francisco: John Wiley, 2006.

[5] For a better understanding of the principles of Lean Start-up approach, please see the book and website of the creator of such an approach, Eric Ries. Web Resource: http://theleanstartup.com/principles. Book: E Ries, *The Lean Startup*, New York: Crown Business, 2011.

- That topics such as User Experience and Business Model innovation are the more difficult to understand for a technical audience;
- That the best way to support the participants in understanding the afore mentioned topics is to give them more time to interact and run through training materials that are specifically designed for giving them guidance during self-training sessions;
- That the creation of a start-up which can have an impact on the local environment requires a dedication and effort from all the actors involved (European institutions, Senegalese institutions, entrepreneurs and developers) which is far beyond the scope of the project, and therefore the value added by WP6 and its legacy must fit inside an ecosystem that can take care of the other components;
- That local organisations have a good expertise in some of the topics and could deliver and review more than half of the training. However, they do not have full capacity yet to train all the topics (e.g. User Experience and Voice technologies development);
- That the interested local organisations would prefer to work a bit more independently, without the need to collaborate closely one with the other on a single training session;
- That local organisations have the interest, the connections and the know-how to take care independently of the organisation of courses of such type;
- That the use of online platforms for delivering asynchronous training sessions is an acceptable condition, provided that local organisations can give connectivity to participants if and when they would need it.

5.1.2. Organisational set-up

We based most of the set-up on what had been defined for the first training session, changing it and integrating when needed. The organisation of the training course had the purposes:

1. Validating the assumptions made (detailed in paragraph 5.1.1 above);
2. Ignite the delegation activities to local organisations, so that the project could have a longer legacy and a follow-up, once this phase is concluded. This delegation is true especially for the organisation and the delivery of training.

The maximum number of people for each training session, the total duration and the collaboration with local Universities (ESMT and UCAD/W3C Senegal) were maintained. More commercial and community-based organisations (CTIC Dakar, JokkoLabs) found it less significant in this case to have a close relationship with the training course.

Training cycle planning and management

Content production

Online Platform

Training session organisation
(logistics, recruitment, session management)

Evaluation

Figure 1 - overview of the organisational structure of this activity

The significant self-training component through an online platform required some significant changes:

- The training was divided in 'face-to-face sessions' and 'virtual modules'. Virtual modules covered the theoretical parts as well as some of those where individual practice was needed. Face-to-face sessions focused on reviewing the concepts and doing practical activities where the group interaction would be beneficial;

- The schedule of the training course has been planned to cover 5 weeks - between the 4th of April and the 5th of May 2013. Face to face sessions where organised for: introduction to the course, practical module on concept development, practical module on Business Model innovation, technical modules on Mobile Web, Javascript and SMS (with specific focus on practical aspects and excercises). On top of that, a face to face session was planned for the end-of-course day, where groups would present their progress. Finally, the

Emerginov platform (see WP2 for more details on the platform) was presented in a face to face workshop as part of the course on the 27th of May. The rest of the training sessions have been planned for asynchronous remote learning: theoretical sessions and online exercises were made available for SMS&VAS, Voice technologies, Mobile Web & CSS, Javascript, User Experience, introduction to Business Models. Participants were given a time period within which they would need to complete a training module (e.g. 2 days to go through the first session on User Experience);

- The UCAD University in Dakar (where W3C Senegal is based), hosted the face-to-face sessions in a computer laboratory made available for free, as part of their local activities. ESMT worked on the organisational aspects of the course (outreach, selection and management of the schedule) in joint effort with UCAD/W3C Senegal;

- A key part of the organisational set-up was the implementation and management of the online portal for self-training, where students would have access to more interactive training materials, as well as the possibility to follow the course in a structured way. PTIN and W3C took joint responsibility on the task, with PTIN focusing on the technical aspects and W3C on the platform and content management. Different routes where explored (creation of an independent site; support to the creation of eLearning areas in online presence of the local partners; addition to existing online initiatives).

Figure 2 - Screenshot of online portal for the self-training modules

The team decided to use W3C DevCampus portal as the basis[6], in order to insure continuity after the end of the project (W3C is committed to a minimum of 3 years of free hosting and management after the end of this project, with possibility to extend it), and in order to avoid the need for multiple installations and possible conflicting requirements from different local organisations, which would lead to fragmentation and irrelevance. The choice of the W3C solution came after an analysis done by PTIN on the possible alternatives. Also, the decision was informed by a previous analysis – done by W3C as part of a past EU FP6 project MWeb - on the best LMS for online training. From a technical point of view, the platform chosen relies on a Moodle (Modular Object-Oriented Dynamic Learning Environment): a Learning Management System strongly disseminated among educators all over the world, providing key tools to manage and promote learning. It is a collaborative project aiming at providing a social framework of education.

Moodle is a software package provided freely as Open Source software for creating Internet-based courses and web sites. It can be installed on any computer that supports PHP and SQL type database, being able to run on Windows and Mac operating systems and many Linux-based systems.

Moodle was selected as the eLearning system mainly due to its intuitive usage and worldwide spread among teachers. Furthermore, its free distribution makes it the right tool for developing countries, contributing to a real sustainability of the training lab.

The training course is accessible for free, provided participants are enrolled in a blended learning training session. Given the need to mix online and face-to-face activities, the content is not publicly accessible by default;

- The name for the training course has been confirmed as *Entrepreneurs du Mobile au Sénégal (EMS)*, in order to give continuity to the initiative started with the first training cycle;

- Training content update was needed in order to facilitate self-training. For this reason trainers involved in the first training cycle – together

Figure 3 - Logo for EMS

with members of the core WP6 team – worked on the creation of media-rich training materials that would work independently from face-to-face training sessions. For more details on the training materials production, please refer to Deliverable D6.4 – Training Materials final release. The most significant update is related to the creation of an interactive tool to exercise and test knowledge on the business model canvas, the key artefact used during the Business Model Innovation module. This has been done by TNO and PTIN. For details on the content, please see D6.4 Training Materials – final release.

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[6] Access to the online portal is available here: http://classroom.w3devcampus.com/enrol/index.php?id=41

5.2. Implementation

The implementation phase of the training course started when the plan for the training was made public, and consisted of two major phases: the recruiting moment and the training delivery moment.

5.2.1. Recruiting, Selection and Enrolment

The EMS training course was publicly announced in February 2013, through a series of emails sent by the local partners to mailing lists and community groups of interested participants. Given the increased ownership on the training from local partners, ESMT and UCAD drove the methods to publicise the call for participation.

The call for participation used mainly word-of-mouth techniques, for two reasons: on one side, our objective was to attract people who were already in some way connected to the various communities we liaised with (professionals in the ICT sector, graduate students, entrepreneurs). This would have allowed us to concentrate the training on the technical, business and design modules that would help participants make the next step. On the other side the cost of more traditional media-based campaign was excessive, compared to the maximum benefits that could be achieved (this was a decision made also after having discussed with local partners and collaborators on the opportunity of a print/radio based campaign).

The submission of interest was possible online through a form. The initiative received a number of applications sufficient for the launch of the training: 32 people applied to participate. Compared to 37 applicants received during the first training, it's a decline of 14% Year on Year, and it was a 64% of the target established (50 applications) to be considered successful, but still more than what would have been considered insufficient (less than 20 participation applications). See more details below for the acceptability criteria:

Participation funnel – targets

Application:
Success: >49
Good: >39
Sufficient: 20

Participation:
Success: >24
Good: >17
Sufficient: 10

Projects:
Success: >9
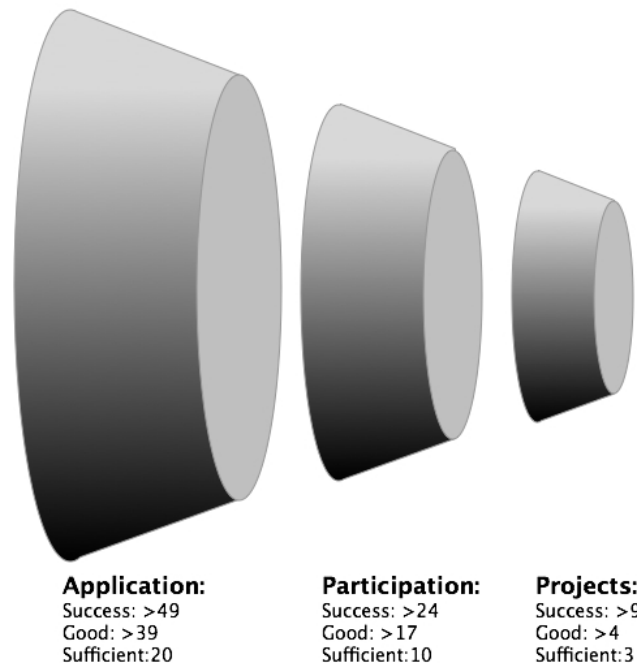Good: >4
Sufficient: 3

Figure 4 - criteria for evaluating response and participation

The selection of the best applicants was a 2-step process: first it was necessary to screen out applicants who wanted to participate without having any clear idea of a possible application or service to create. Given the strong self-training component, it would have been too difficult to follow participants without a compelling motivation to learn in order to apply to a specific case. Once the screening process finished, 2 expert reviewers scored the participants on a scale 1 to 5 (where 1 is the minimum and 5 is the maximum) based on the following criteria:

- Knowledge: What are your knowledge of technologies, platforms and programming languages?
- Experience: What background do you have in application development, entrepreneurship and other areas that you intend to use for this training?
- Motivation: What interests you and motivates you in this course? What are your goals for this course?

Each of these questions was valued a 30% of the final score

Participants were also scored on the general quality of the submission, in order to capture more intangible elements (like the effort put into writing their application). This parameter counted for the final 10%.

Although the number of applicants were in an order of magnitude comparable with the one in the first training session, the new – stricter - selection process meant that only 11 candidates out of 32 were selected. This group included 13% of women vs. 87% of men, and 42% of students vs. 58% of professionals.

The number of participants was sufficient (although far from good). In this situation, the crucial aspect was to confute / validate the assumptions made at the beginning of the activity. Participants with insufficient basic preparation, or anyone who did not have a project to apply the learning session, where not invited back at this point, as it would have diluted the attempt to reach validated learning. For this reason we proceeded with the initial plan rather than delay and run a second outreach program in order to get more participants.

The enrolment of participants was subject to a payment of a symbolic fee of 15000 CFA (approx. 22€), which would cover catering. Compared to the 50000 CFA fee of the previous training session, the second training allowed to reduce the financial barrier to entry for students and at the same time to reduce the organisational burden for the local organisers.

5.2.2. Training sessions

The training course – as mentioned multiple times – was comprised of online learning modules and of face-to-face moments. The virtual sessions had the goal of introducing the different technical and business topics, and to give participants the fundamentals. For each training module, participants were invited to focus on the training materials available (and to expand their knowledge of the topic through additional online researches). For many topics, face-to-face sessions were held at the UCAD University (where W3C Senegal is based), in a computer room, with sufficient space for group interactions and work. This kind of sessions focused mainly on the review of theoretical elements and on the practice / exercise components of training.

Training modules were prepared by a variety of local and international trainers:

- Online voice applications: Max Froumentin, lead software developer at the World Wide Web Foundation. Expert in voice XML and voice-based applications (working in the VOICES project on the delivery of the voice service for WP5);
- Online User Experience: Franco Papeschi, User Experience and design expert at the World Wide Web Foundation. Expert in User-centred product development, qualitative user research and interaction design;
- Online Business Model Innovation Canvas: Pieter Verhagen (TNO) and Joana Valente Quintela (PTIN);
- Online SMS and VAS: Filipe Cabral Pinto (PTIN);
- Online Mobile Web: François Daoust and Marie-Claire Forgue (W3C);
- Face-to-face SMS Applications: James K. Tamgno, Professor at ESMT and expert in SMS and voice-based applications;
- Face-to-face Mobile Web & Javascript: Jean-Marie Preira, Professor at ESMT. Expert on mobile development and web technologies;
- Face-to-face Business Model innovation: André Onana (ESMT) and Yves Afoutou, expert of business for start-ups at CTIC Dakar;

- Face-to-face prototyping platforms: Aristide Thomas Mendo'o (ESMT), expert developer for the Emerginov platform (developed in WP2);

As part of the training sessions, 2 projects have emerged and participants are working on the design and implementation of the following services:

- **Price Monitoring system** (name WiP): the project wants to establish a platform for monitoring and comparing prices on selected products. This platform consists of a web application coupled with a mobile web application. Product prices are recorded and updated continuously. Note that a module map and navigation will be integrated into the platform to quickly locate the position of merchants. On the other hand, the platform will empower consumers to subscribe to an SMS service that will allow them to track commodity prices. After sending the product code to the service number, the consumer may be alerted automatically when a better price is available for the corresponding product over a defined period.
- **LinkSchool:** the project wants to change the concept of learning. Its goal is to promote independent learning, collaborative and self-study in order to further develop basic skills for life-long learning. LinkSchool proposes the idea of a remote platform that has the tools and documentation necessary for the communication between stakeholders (teachers, students and parents). This platform will allow to enhance learning outside formal school hours.

5.2.3. Engagement and participation

The participation to the training by the 11 students was one of the major aspects to follow and monitor.

We can divide the class in 3 different sub-groups, according to the participation style:

- **Assiduous**: nearly half of the participants (5 people) had consistent presence, were very active both online and face-to-face, and ready to experiment through their project on newly-learned methods and techniques.
- **Selective**: 2 participants used the training course to fill in the gaps of knowledge where they were less expert. In this case the participation rate was around 50% (with online activities being followed more often).
- **Discontinuous**: the rest of the participants (4 people) engaged with the course rarely, and only when their other commitments allowed them to dedicate time to the training. From the feedback received from this group, a combination of selective interest and lack of a recognisable responsibility in following the training was the basis for their behaviours.
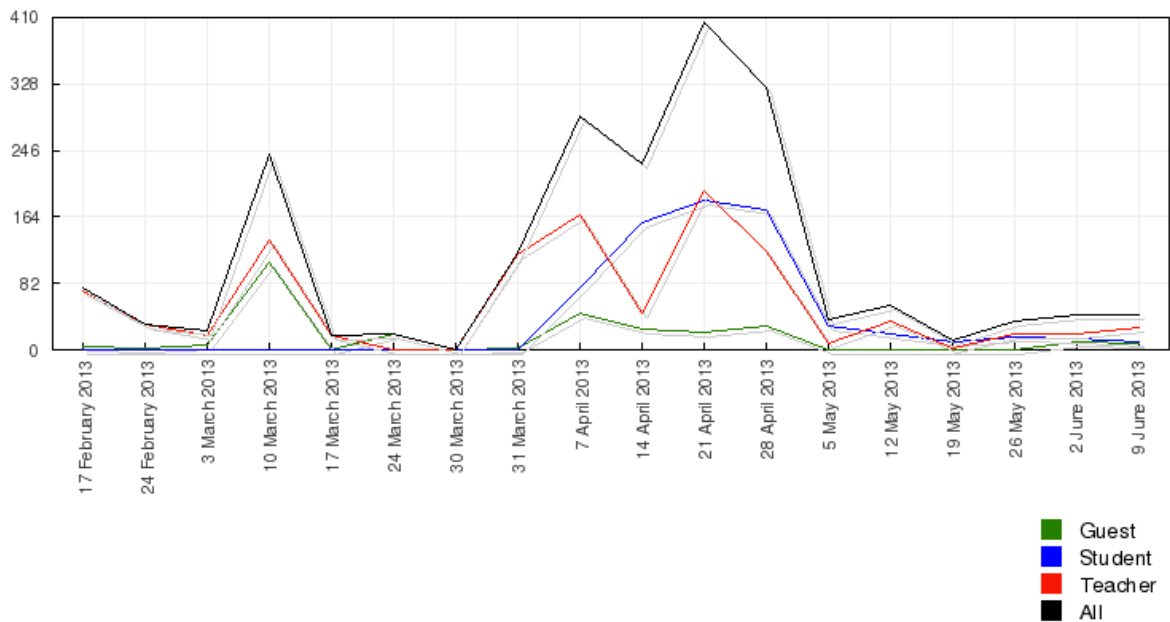
Figure 5 - visits to the online training platforms - divided by type of users

Compared to the previous training session, which was face-to-face only, the patterns of participation where not entirely dissimilar, with half of them being assiduous participants, and the rest split between selective participation and discontinuous participation. The key difference we found was in the ration selective: discontinuous participation: while in the first training the group of people rarely participating was residual (3 people out of 20), in this case we had 4 people belonging to this category, which is percentually more relevant.

In order to understand better this discrepancy, we gathered feedback from people who did not manage to finish the course and from the organisers of the course. We had 4 participants replying to a survey focused at understanding their initial motivation for registering to the course, and what were the causes that motivated them to not complete it. Other 2 people did not reply to the request for feedback. Of the 4 people, all 4 had common interests in the SMS and Business Model courses. From what has been shared with us, the quality of the content for the modules – and especially the modules that motivated people to join – were not a cause for dis-engagement. One of the participants had to leave because of health-related reasons. Another participant left for similarly personal reasons (clash between workloads and travels with the period of the course); such a reason can be considered also an 'organisational' reason. A third participant did not complete the course fully for logistical and organisational reasons (overlap between work and the course). Finally, the fourth participant who gave us feedback realised half-way through the course that the level of difficulty – especially for the technical components) was too high for his skills and expertise.

While the information received through this feedback channel is too small to give any statistical evidence, it's nonetheless important to highlight that this is consistent with the feedback received from the organisers and facilitators of the course (ESMT, UCAD/W3C Senegal). In their view – in particular – the key issues from their point of view were:

- A challenge in communicating the format and the organisational components to the students (how to start; deadlines; tasks to accomplish;…);
- A difficulty in using and setting-up the different components of the Moodle platform, in relations to the most interactive elements such as the chats and testing modules.

As a mitigation action, the team is working on the creation of a booklet to guide interested organisations to set-up and manage different instances of blended learning training course, using the materials and format identified during this project. The booklet will include:

- Outline of the key benefits of the approach;
- Step-by-step guide on how to request and be accepted as organiser of such training courses;
- References and instruction (with links to official training materials) to use the Moodle platform;
- Promotion materials and guide on how to use them;
- Details of identified format of the training course (logistical aspects; deadlines; tasks;…);
- A description of the educational activities to perform during the face-to-face workshops and during the online periods.

We believe this booklet will facilitate the task of the organisers, and will help them manage the expectations of the potential participants before and during the course.

5.2.4. Course evaluation

Aside of gathering feedback on the issues of non-participation, the team and the organisers collected feedback on the quality of the training by the people who followed assiduously the course. Out of the five assiduous participants, three provided useful feedback to understand how the different aspects of the trainings have been received, and what can be improved. Given the small numbers, these have no statistical value, but they provide useful reference for the further improvement of the course. The most significant results are:

- Content of the training sessions has been considered of good quality (an average of 4.66 – in a 1-7 scale, where 7 is the maximum);
- All the respondents say they can transfer the notions learnt to a real project;
- The general organization of the course is sufficiently appreciated by the three subjects who responded; however, subjects emphasize temporal organization

problems (estimates vary from 3 to 4 in a 1-7 scale, where 7 is the maximum). Digging deeper into the reasons for this, the key aspect of friction seems to lie in a difficulty to organise time slots that allow online learning while keeping the sense of a training course;

- The eLearning platform is generally appreciated enough (votes 4 to 6).
- The interactivity with the teachers do not seem to be sufficient even if the qualitative point of view, the subjects seem satisfied.

From a qualitative point of view, respondents believe the course is recommended for its innovative character.

These findings confirm what had been identified in the previous paragraphs, related to the difficulties in the course organisation. They also point out to the possibility to further improve the content.

5.3.　Outcome

The outcome of the course can be divided in 3 major categories:

- Acquired skills: we are processing the final evaluations of the evaluations for the training skills. Initial feedback has considered the course a positive experience especially on the area of the Business Model innovation.

- Projects: It's too early stages to evaluate the projects coming out of this session of training. Considering the small number of assiduous participants – however – we have reason to think the impact of the training on the projects will be measurable more in the delta quality of the project, rather than in stimulating a quantity of new projects. We had seen in the previous training cycle that the course has a perceived positive effect on the eyes of the future entrepreneurs on the possibility to succeed. 2 of the projects of the first training session have progressed.

- Learnings and validation of assumptions: this is perhaps the biggest category of outcomes of the training session. Key learnings identified include:

    o That local organisations need to have almost complete ownership of the training sessions organisation. ESMT and UCAD gave feedback that considered this to be a strange hybrid, neither third party course nor their own course. As a consequence for this lack of perceived ownership, the effort put by local organisers was not enough to compensate the reduced intervention from the European partners;

    o That the lack of involvement of more initiatives more oriented towards the professional communities (e.g. JokkoLabs, CTIC Dakar) reduces the level of engagement and vitality of such initiatives;

    o That there may not be product/market fit for such kind of activities in Senegal alone. Despite the established connections and efforts taken during the past 30 months, the levels of interest from the communities

of entrepreneurs, students and ICT professionals where significantly lower than expected;

o That local partners require more guidance and support to make sure the model of blended learning is successfully applied: while face-to-face training sessions are something that institutions like Universities and community groups are familiar with, training sessions organised with a mix of online and face-to-face activities are still uncommon, and more support would be required both to the participants and to the organisers;

o That participation tended to be more discontinuous than in typical face-to-face training. This is likely due to a mix of the previous causes, and to a different perception by participants on the need to keep a structure and assiduity, the same way a 'normal' training session.

o That – however – the use and participation of the online training platform seems to be higher than expected.

As a result of these considerations, we would consider the outcome of this experimental activity of the second training cycle a very limited success, with 2 major caveats:

- The learnings identified have informed the team on how to guide future trainings. These will be captured in a 'Guide for interested organisations' – providing key directions on the dos and don'ts;

- The online portal, its materials and structure provided is a key legacy of the program.

6. ACTIVITY 2: CONTRIBUTION TO CODERS4AFRICA TRAINING

As described in Chapter 4 of this Deliverable, one of the elements to test in the business model was to identify if and how parts of the training package we have created could fit within activities fully organised and managed by third parties. If the 'Platform-as-a-Service' business model has to succeed (see Deliverable D6.9 for more details on this), the training and activities must be seeded and integrated within the work of independent organisations, with minimal involvement on the organisation and management from the core team.

In November 2012, we have contributed with the delivery of "User Experience" and "Business model innovation" modules to a face to face training session on mobile and web technical development, organised by Coders4Africa in Dakar. 20 participants have successfully completed the training, which is allowing them to create digital services for relevant companies. In this way, we have been able to strengthen a local organisation, and extend the number of beneficiaries of the initiative.

The rest of this chapter describes the tasks done for this activity. First we describe the choice of the third-party organisation and the assumptions we had. Then we describe what has been done during the course. Finally we discuss about the outcome of the course, as well as the outcomes for the project.

6.1. Planning

The planning of this activity included explicating the list of assumptions and hypotheses to confute / verify, the selection of a third-party organisation to work with, as well as the work done to integrate some of the training modules created in this endeavour within their existing training course. The paragraphs below describe both of these aspects

6.1.1. Assumptions

The key assumptions we had to verify or confute were:

- That there are third-party organisations which are independently organising capacity building activities, but do not have the full set of expertise to cover all the crucial aspects in training sessions that would maximise the impact of their beneficiaries / participants;
- That lack of expertise resides especially in training on voice technology development, User Experience and design, Business Model innovation;
- That grassroots/community-driven initiatives as well as academic institutions may be the key targets for this type of activity;
- That grassroots initiatives would be an easier target in first instance, due to their nimbler organisation and flexibility to adapt their curriculum;

- That these organisations would be willing to integrate some of these missing expertise in their own curriculum, recognising the value they add;
- That the team behind this project can deliver such approach with minimal effort;
- That some due diligence activity is needed to assess the quality of the third-party organisation;
- That there may be the opportunity of covering the costs of such activity.

6.1.2. Selection of Partner

The selection of a community-driven initiative was driven by our requirements for an organisations that could fit with the profile needed. Key requirements included:

- Organisation (or its members) should have a reputation in the ICT4D community in West Africa;
- Organisation should have a plan to organise a mobile/web-focused training session in the period September 2012-march 2013;
- Organisation would benefit from some of the training modules identified in the assumptions;
- (Optional) there is an established cooperation between one of the members of the consortium and the organisation,

First targets were CTIC Dakar and JokkoLabs, given the cooperation in previous training. However, their plan do not include formal training sessions. We then identified 2 different candidates:

- *Jjiguene Tech Hub*: the first women tech network in Senegal;
- *Coders4Africa*: a community of software developers with physical meetups in different parts of Africa (including Dakar) which runs training sessions for the creation of web and mobile applications.

Due to time constraints, we selected to work with Coders4Africa.

In 2012, Coders4Africa (C4A) launched a training initiative in Dakar. Their program focuses on specific technologies in web/mobile, soft business skills and software development patterns while keeping the African context in mind. We found the approach they proposed compatible with the one defined for the first training session of the WP6, and so we started working on the integration of

20 software developers were taught the Software Development Life Cycle (SDLC) principles (which is often missing from traditional education, practices and processes) and how to understand/translate technical writings in order to effectively communicate with other developers, engineers and most importantly clients for each project.

6.1.3. Integration of curriculum

Given the C4A expertise in Software development, and their not-so-high interested for voice technology development, the key areas of integration where User Experience and Business model innovation. The training session of C4A was conducted in a 13-week timeframe, from October 2012 through January 2013. It was divided into 2 major parts: 'Fundamentals' and "project". C4A describes their training in the following fashion:

> *The Fundamentals course will focus on concepts that can be both applied for Web and Mobile software development life-cycle. Students will acquire knowledge and skills on the following topics: design patterns, Object Oriented Programming, data modeling, software development processes with emphasis on agile methodologies and software architectures.*

> *The topics of fundamental courses are based on the latest advances in the field of IT with a strong focus on practical applicability. It is designed to support 'projects' as it progresses through its different phases. Some of the resource will be provided from online sources.*

> *The 'project' is the backbone of the training curriculum. Within the project, students develop their competencies in an authentic context, including real clients. Trainees are treated as "junior employees" and expected to explore and demonstrate innovative concepts using technology, as well as analyse the technical, economical and social feasibility of the project. Moreover, they will be taught to understand technical writings be able to effectively communicate with other developers, engineers and the common civilian.*

Given the structure, we agreed to have two major modules:

- a face-to-face User Experience module that would review the requirements and help participants to transform them into a cohesive structure for their application. This happened in November 2012;
- a face-to-face Business Model innovation module that would help the teams transform their idea into a proper business, thus helping their 'clients' understand better the potential for the new service. This happened in January 2013.

The selected delivery method was through face-to-face seminars, as the online presence for eLearning was still not completed.

6.2.   Implementation

The implementation was done by trainers of the Web Foundation expert in the subjects. Each module was taught in 3 3-hour sessions, happening during evenings or weekend. From an organisational point of view, the training was free at the point of use and there were no payments done by C4A to any of the members of the consortium.

Both modules had a highly practical component, given the pivotal role of projects for the type of training.

The 20 participants to the training were divided into 5 groups of 4 and tackled the following projects:

1. DARAL

   Description: Farmers and Cattle herding management system

   Client: Amadou Sow (Secretary of the Union of breeders of Fatick, Senegal)

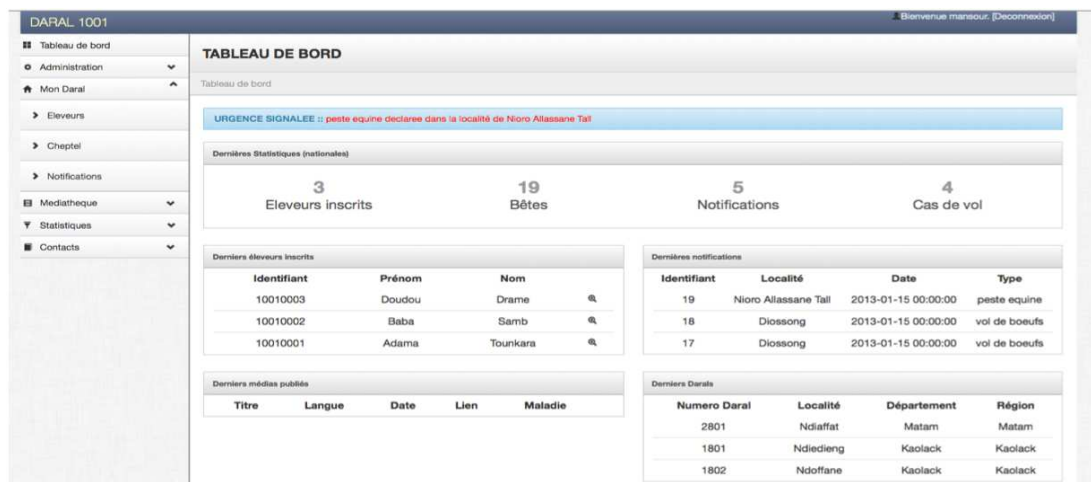   Team composition: Sokhna Sagna, Sada Kalidou Sow, Mansour Fall, Amdane Samb and Ibrahim Khalil

Figure 6 - Screenshot of Daral application

2. GEOPHARMA

   Description: Management of Pharmacies and health facilities in Senegal

   Client: Senegalese Association of Pharmacies

   Team Composition: Fatoumata Traore Sall, Togbe M. M. Lucrece, Omar Sokhna, Prince P. Tsaty
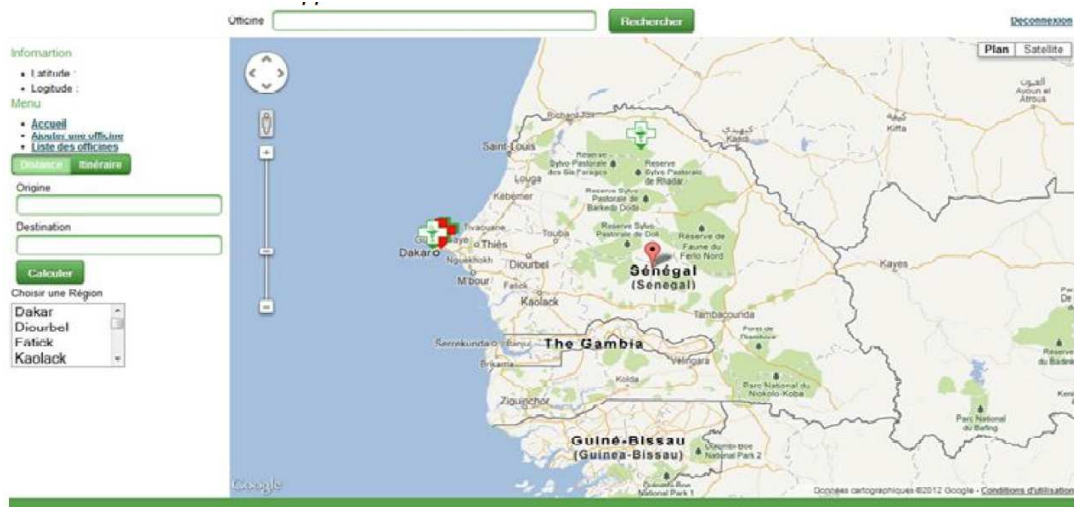
Figure 7 - screenshot of Geopharma app

3. KENEFA

Description: A Pan-African health system with a repository of infrastructure and health facilities, statistics and country comparison will be available.

Client: Peter Speyer Director of Data Development Institute for Health Metrics and Evaluation, University of Washington

Team composition: Pape Samba Diop, Jacob Sawodogo, Yazid Abdou Wabi and Ousmane Samba

Figure 8 - screenshot of Kenefa

4. ELIMU

Description: School management system to monitor and manager public and private schools in Senegal

Client: Etablissement scolaire Samibou, Yoff Dakar, Sénégal

Team composition: Andalla Mbengue, Saikou Fall, Herilovasoa Rakotoarison and Abdoul Aziz Wade

5. QUICKCOLLECT

Description: Data collection and transmitting solutions using mobile devices Tablets and smartphones with Android OS

Client: IDEV Consulting, Dakar Senegal www.idev-ic.coml

Team composition: Momar Kouta, Talla Diop, Bocar Sy, Houefa Awohouedji and Leger Djiba
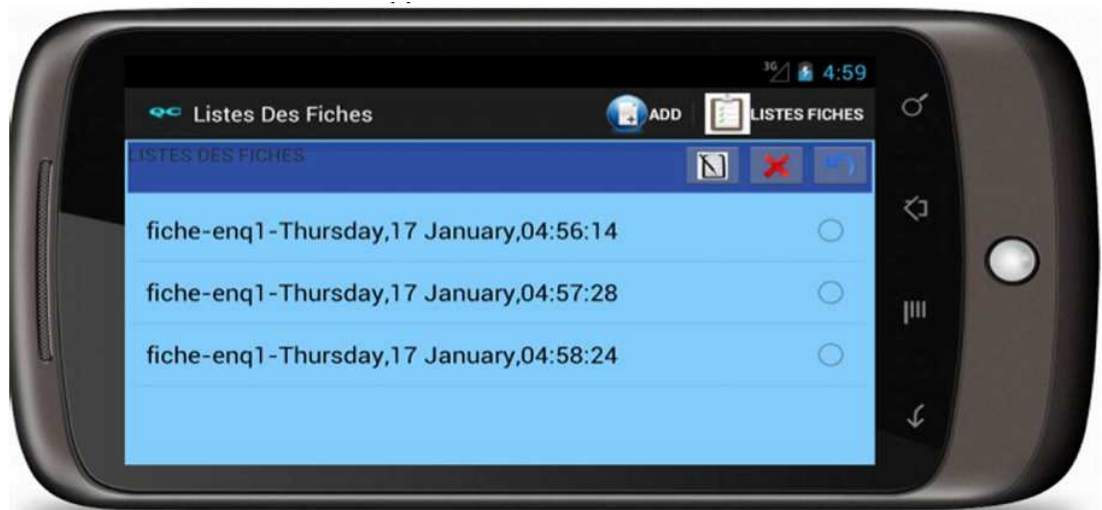

Figure 9 - screenshot of QuickCollect

The training sessions used training materials delivered in D6.3, and had a Creative Commons license.

Figure 10 - training session on User Experience

Figure 11 - review of groupwork

6.3.   Outcome

The training in itself is having quite an impact on the lives of the participants, with not only for the new capabilities acquired, but for jobs they are having (mostly through the continuation of the work done during the training sessions, which was for real clients).

From an organisational perspective, we have identified one possible partner for the integration of training modules, and we have learnt that most of the basic assumptions were true. The only one not verified is the possibility to cover costs though such activities, as everything had been done gratuitously.

7. MONITORING PROGRESS

The monitoring of the training activities will be done according to 2 sets of criteria: on one side, the training must be able to demonstrate compliance with the requirements identified. On the other side, training must demonstrate significant progress in the performance assessment of the lab activities table, as identified in Deliverable D6.1.

7.1.   Compliance to the training requirements

The requirements have guided the creation of the training activities, so it is fair to predict a good level of compliance with these. In detail:

Training requirements identified	Compliance
The course has to offer training on mobile and web technologies, given the rates of adoption of these information and communication channels;	**YES** Technical training on SMS, Voice technologies for automated data services, mobile web and HTML 5 development guarantees possibilities for delivering services across multiple (relevant) channels.
The entire initiative must have a strong component of training and supporting voice technologies, given the prevalence in usage of voice channels, and the relatively high level of illiteracy in Senegal and West Africa (and considering the outline and purpose of the Voices project);	**YES** 3-day training of voice-based applications is complemented with a further 1 or 2-day training on prototyping platforms (based on the open source platforms available through Emerginov), which includes the creation of voice applications.
The training should be modular, in order to facilitate participation, especially for people who have to fill in a small sub-selection of expertise gaps, compared to entire offering;	**YES** Modules have been clearly defined (in 3 different tracks) and communicated upfront. This structure has proven useful for the segmentation of the curriculum and integration in 3rd party courses.
The training should not be limited to	**YES**

technical topics, but include business innovation, management, design for start-ups and launching SMEs;	Training includes practical modules on business model innovation, qualitative and quantitative market research and user experience.
The initiative should have a specific focus on the creation of applications, content and services that have a local impact, in order to fulfil the goal of stimulating the growth of the mobile and web ecosystem;	**YES** The combination of the modules has been designed to facilitate product development. The activities done in the partnership with C4A have demonstrated the value provided by having such focus.
The style and format of the training must be extremely practical, hands-on and project oriented, as it needs to bridge a highly theoretical education, usually offered in most Senegalese higher education institutes, with the practical needs of working on end-to-end projects (as it happens in start-ups);	**YES** The theoretical part of each class (usually not more than 2 hours) was always followed by exercises, as well as time for the teams to apply the new methods and practices to their own projects. These where reviewed multiple times during the course.
The entire initiative should facilitate strong connection with other realities in Senegal (Universities, incubators, acceleration spaces,…) and in the region (other labs in West Africa);	**YES** This was obtained during the first training session through the liaison with JokkoLabs and CTIC Dakar. In the second training cycle we have strengthen the relationship between ESMT and UCAD, local Universities. During the second training cycle we also partnered with a community-based group with activities in Senegal.
The initiative should benefit and help highlight successes and challenges of the other working packages of the VOICES project;	**YES** The technical development work for WP5 was shared during the Voice training. Participants are also trained on the work done through WP2 (Emerginov platform).
The training should have a platform-agnostic approach, which will help participants to benefit from the most	**YES** Technical development training has presented multiple (open source and

open and flexible platforms for their services.	commercial) platforms.
The training must be able to support trainees who have slightly different expertise levels and learning paces, by providing space for self-training and review of the newly acquired capabilities;	**YES** The online platform has allowed trainees to review training materials, and then discuss about it in face-to-face sessions.
Time and place of delivery of the training must be as flexible as possible, as participants need to perform difficult balancing acts between the training times and their traditional schedule;	**YES** The use of the online platform has reduced the occasions of inflexibility in the schedule.
Cost and complexity of the organisation and delivery of the training session must be reduced, in order to make it sustainable for local partners to carry the initiative forward	**PARTIALLY** The organisational complexity has been still an issue for the full-training cycle. Less so for the integration of single modules inside 3rd-party trainings.

7.2.   Progress in the performance assessment of the lab

In Deliverable D6.1 we identified a series of KPIs to monitor the output and outcome of all the activities of the lab. For some indicators, we don't have final numbers, either because the work on that aspect is in progress (e.g. satisfied trainees), or because it's still too early to measure that indicator (e.g. number of jobs).

Particularly difficult is the determination of the final cost, which includes a great number of in-kind donations (time spent by trainers, collaborators, external participants) and for which we don't have all relevant data yet.

Outcome	KPI	Progress
Volume	• # trainees • # partnership • # jobs • # start-ups	51 4 6 2

Quality	• # extremely satisfied trainees • # drop out rate • # success final assignment • # recurring attendees	57% (1st training) 45% 70% -
Visibility	• # views on elearning / knowledge sharing platform • # downloads • # visit on website	2100 approx N/A N/A
Sustainability	• Fee • Cost • Cost per student (trend)	22-75€ See D6.9 100-200 €

8. CONCLUSION AND NEXT STEPS

This document has described with detail the work done to prepare and deliver the second training cycle. The complex series of activities have seen may successes and few opportunities for improvement.

In the meantime, there are a series of activities that need to be completed to be able to have a full view on the success of this WP:

- Participants will finish their work on the services they have proposed in the month of July 2013.
- A booklet 'Guide to create training sessions' need to be put together as a supporting documentation for the online portal.

On top of this, liaisons with organisations interested in carrying the project forward both locally and internationally (besides W3C) is on-going, with contacts with Coders4Africa, AfriLabs and other organisations.