Using wireless technologies for context sensitive education and training

CONTSENS (Agreement number 2007-1968)

QUALITY ASSURANCE PLAN

CONTENTS

The Quality Assurance Plan for the CONTSENS project lays down the requirements which the project must comply with to ensure that the development of the products conforms to the contractual agreement with the Life Long Learning Programme. It gives guidelines for the evaluation of the products and the processes of the project.

GENERAL ISSUES ABOUT PROGRAMME EVALUATION

Why evaluate?

Evaluation gives us information about the quality of human enterprise, of educational programmes, of research projects, of innovations or whatever other items we evaluate. Without evaluation, we could not know whether a project was developed as intended, whether a curriculum was effective, whether the target group was appropriately selected, whether the project objectives, i.e. student achievement, performance evaluation, web-based instructional design, etc, were satisfactorily done or whether the moneys for project development were used well.

Evaluation is an essential part of all educational projects. Among its benefits one may list the following:

- Identification of needs that should be addressed
- Documentation of desired outcomes in accordance with a previous needs analysis
- Detection of problems before correction becomes too difficult, too late or impossible
- Identification of the resources – human, technical or material – that are necessary for use in the project
- Identification of strengths and weaknesses of the project or of its realization – this is a first step towards improvement
- Identification of information useful in educational planning and decision making, including information on costs

Why are evaluation designs needed?

For the project coordinator and partners, the evaluation plan provides an opportunity to review the type of information that will be obtained by the evaluation. In this way additional or alternative types of action and data collection can be suggested if it is necessary to provide further information to all the users of the evaluation results. The purpose of an evaluation design is to provide all the partners in the project and associated users, with a road map describing the sequence of events connecting the need for the planned programme with the desired results of the programme.

Evaluation procedures have, as their main objective, to check the plan to carry out the project, in order to ensure that no unexpected disruptions of the programme occur. Other more detailed objectives are as follows:

- To assure a clear and accurate direction of the study, establishing the procedures for collecting data and information for the project evaluation from the beginning to the end
- To assure the adequacy of the evaluation procedures
- To provide a clearly defined set of tasks so that the evaluation pays adequate attention to the important objectives
- To assure the efficiency of the planning for the resources and activities needed to realize the programme.

Mapping a proposed evaluation design helps one to visualize and understand how human activities, technological and other resources, can contribute to achieve the intended project goals and can lead to improvements in the programme design. The evaluation plan helps to create shared understanding of and focus on programme goals and methodology, by relating activities to projected outcomes.

The different steps in programme evaluation

The different sequences for evaluating a programme are presented in the following diagram:

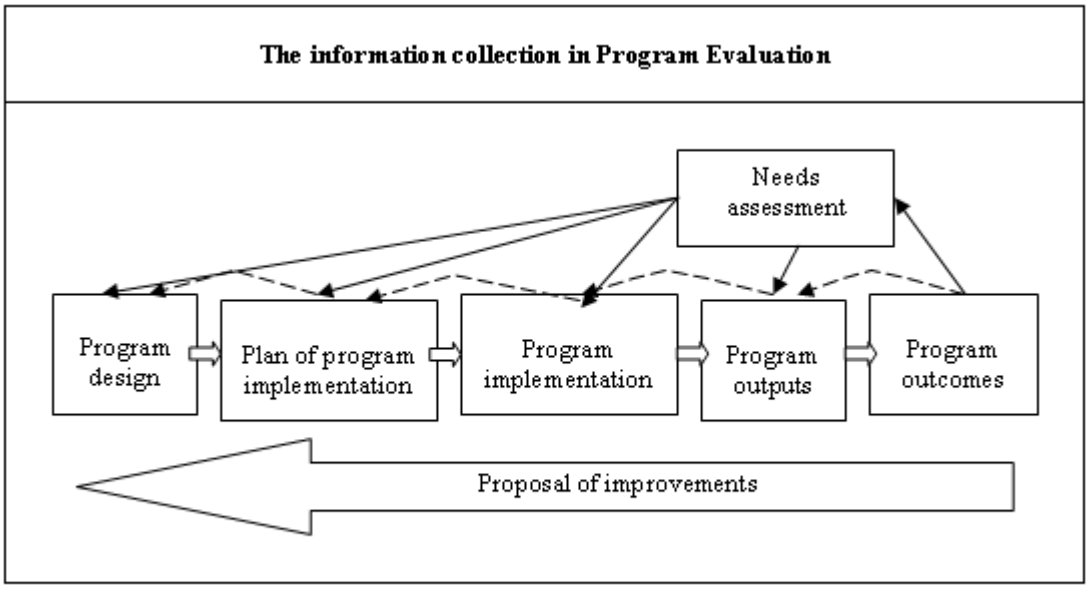

Figure 1. The information collection in Program Evaluation (Martínez Mediano, 2004:123).

Programme evaluation is centred on:

- The needs analysis of assessment that guides the project and the programme that are central to the project. Needs assessment is the starting point for all research projects and programme evaluation participates in the research characteristics.
- Evaluation of programme design includes a focus on the quality of the goals, the contents, structure and planning of the action, the application strategies in accordance with the goals and approaches of the project, taking account of the materials, training personnel and financial resources involved
- The evaluation of the ongoing programme process monitors what is being applied, following the guide that was developed and reports on necessary adjustments and changes
- The checking of results and the impact of getting the outputs and outcomes intended in terms of effectiveness and satisfaction of the target groups, the personnel involved in the project and society.

In this way, evaluation becomes a powerful tool for quality improvement of projects, plans, programmes, organization, personnel and groups by focusing on documentation of the different stages of the development of the project from beginning to end (Martínez Mediano 2004:115).

There are different models of programme evaluation for guiding the evaluation. Two approaches are mentioned here. One of these is the CIPP Model (Context, Input, Process and Product) by Stufflebean and Skinfield (2007) and includes four types of programme evaluation, centered on the evaluation of:

- The goals, based on the needs
- The design in the context (planning)
- The realization processes
- The achievements.

The CIPP Evaluation Model is a comprehensive framework for guiding the evaluation of programmes, projects, personnel, products, institutions and systems.

The other model is the Comprehensive Model of Rossi and Freeman (1993). This approach considers that the main activities in programme evaluation should be centred on the following aspects and that information should be collected on these aspects:

- Analysis related to the conceptualization and design of the programme linked to the objectives that have been elaborated
- Analysis and study of the implementation of the programme

- Evaluation of the utility of the programme. This includes the effects of the programme and its impact in terms of effectiveness and efficiency – effectiveness is seen as the relationship between the intended and the achieved outcomes and efficiency is seen as the relationship between the intended costs and the actual costs.

These three activities should be carried out in all evaluations. This evaluation is denominated ‘Comprehensive evaluation’ and is defined as the systematic application of the procedures of social investigation in the evaluation of the conceptualization and design of a programme, in the evaluation of its implementation and in the evaluation of its outcomes.

Among the objectives of the evaluation of innovative programmes, Rossi and Freeman (1993) include the evaluation of its impact and the estimation of its effectiveness.

The prerequisites for the evaluation of the impacts of an intervention and of its final results are:

- All projects should have their objectives sufficiently well articulated to make it possible to identify the objectives and to measure the goals achieved
- The intervention should have been sufficiently well implemented for there to be no doubt that the critical elements have been carried out in accordance with the objectives. This is because if the application of the programme has little to do with the programme, the evaluation will be of something else and not the programme.

It is important that the monitoring of the application of the programme has as its object attention to two main issues:

- Whether or not the programme appropriately reaches its target population and
- Whether or not the realization of the processes of the programme is appropriate to the specifications of the design of the programme.

At this point it is appropriate to mention the issue of research methods in programme evaluation.

General criteria for conducting an evaluation. Standards in programme evaluation.

According to the Joint Committee on Standards in Educational Evaluation (1994) the four groups of standards in programme evaluation are:

Utility Standards

Utility standards are intended to ensure that an evaluation will serve the information needs of intended users.

- Information collected should be broadly selected to address pertinent questions about the program and be responsive to the needs and interests which it serves.

- The findings should be carefully described, so that the bases for interpreting it are clear.

- Evaluation reports should clearly describe the program being evaluated, including its context, and the purposes, procedures, and findings.

Feasibility Standards

Feasibility standards are intended to ensure that an evaluation will be realistic, prudent, diplomatic, and frugal.

- The evaluation should be planned and conducted with precision.

- The evaluation should be efficient and produce information of sufficient value, so that the resources expended can be justified.

Propriety Standards

Propriety standards are intended to ensure that an evaluation will be conducted legally, ethically, and with due regard for the welfare of those involved in the evaluation, as well as those affected by its results.

- Evaluations should be designed to assist organizations to address and effectively serve the needs of the full range of targeted participants.

- Obligations of the formal parties to an evaluation (what is to be done, how, by whom, when) should be agreed to in writing.

- Evaluations should be designed and conducted to respect and protect the rights and welfare of human subjects.

- Evaluation should be complete and fair in its examination and recording of strengths and weaknesses of the program being evaluated.

Accuracy Standards

Accuracy standards are intended to ensure that an evaluation will reveal and convey technically adequate information about the features that determine worth or merit of the program being evaluated.

- The program being evaluated should be described and documented clearly and accurately.

- The context in which the program exists should be examined, so that its likely influences on the program can be identified.

- The purposes and procedures of the evaluation should be monitored and described in enough detail, so that they can be identified and assessed.

- The sources of information used in a program evaluation should be described in enough detail, so that the adequacy of the information can be assessed.

- The information-gathering procedures should be chosen or developed and then implemented so that they will assure that the interpretation arrived at is valid for the intended use.

- The conclusions reached in an evaluation should be explicitly justified.

- The evaluation itself should be evaluated to examine its strengths and weaknesses.

Research methods in programme evaluation

The evaluation of the development of a programme gives information on how the programme was developed and how and why it has strayed from the initial plans and expectations. Such deviations are quite common and natural, as well as being essential to identify. If the setting in much of a programme is characterized by a process of adaptation to the real conditions, needs and interests, the methods used to study the application should be guided towards the discovery of and the attempt to understand the developed processes and the changes of the programme.

The evaluation of programs is a modality of applied research investigations, and this type of research uses methodologies of the social sciences. Given the complexity that the programs and their implementation contain, the methodologies of collection of information and data and their analysis must include a great diversity of methods, techniques and instruments following the principle of methodological complementarity.

In evaluation a great variety of methods are used both qualitative, such as participant observation, group discussion or quantitative such as experimental group design, using methodologies for the collection of information such as systematic observation, yield tests, attitude questionnaires and achievement lists, depending on the objectives and the phase of the evaluation.

In the following table the possible methods and techniques for the collection of information in the realization of programme evaluation are shown:

RESEARCH METHODS IN PROGRAM EVALUATION			
PURPOSE	DIMENSION	OBJECT	METHODS AND TECHNICAL
NEEDS ASSESSMENT	- The context	- People and their context	- Results of previous evaluations - Reading of reports, memoirs - Realization of surveys, interviews, observations
PROGRAM DESIGN	- The quality of the program and of its goals	- Goals - Contents - Structures - Viability	- Analysis of the structure and content of the program by experts - Comparison with quality approaches of the program design
IMPLEMEN-TATION	- Adaptation to the goals and the context	- Strategies - Activities - Climate	- Analysis of the resources of the context - Planning evaluation - Resources evaluation - Comparison with quality approaches of program implementation
ANALYSIS PROCESS	- Adaptation to the departure situation - Realization - Frame	- Verification - Approaches - References	- Evaluation of program progress, - Evaluation of participation and satisfaction (Observation, questionnaires, interviews...) - Comparison with quality approaches
ANALYSIS RESULTS	- Achievements - Measurement - Valuation	- Verification - Criteria - References	- Program effects, positive and negative - Evaluation of achievements in relation to the criteria - Evaluation of satisfaction - Experimental or quasi-experimental group designs
PROPOSALS FOR IMPROVEMENT	- Decisions	- Maintain - Remove - Proposal of change for improvement	- Report of the total and integrated project, plan, program and results and proposals for improvement - Planning of the application and pursuit of the improvement proposals

Figure 2. Research methods in program evaluation (Martínez Mediano, 2004:125).

STRATEGIC PROJECT MANAGEMENT TOOL-KIT

The *Strategic Project Management Tool-kit* of the SPreaD European Commission project contains valuable strategies for quality assurance in project management (www.wiki.spread-digital-literacy.eu.)

At the outset of the project it is important to be clear about the target group to be addressed, the envisaged concepts to be used to reach and actively involve this target group and the procedure which promises to be most effective. It is worth making sure that the programme concept takes account of current political strategies at European level. It is a good idea to consider which interest group might be able to help implement and publicise the project.

The first stage is to develop technically appropriate instruments for training and development purposes as well as for publicising the project and project successes. It is important to define monitoring and management instruments and to plan change processes that enable flexible responses to developments in the target group. Communication is a critical success factor in the project phase.

Planning phase

In the planning phase communication programmes will be developed and a communication plan for the project will be set up:

- Definition of the communication objectives and communication target groups
- Development of a communication strategy which comprises:
  - Project presentation at well known events
  - Awareness raising
- Choice of communication tools.

Quality management tools

It is important to measure the achieved effects and results of projects continuously both for project management and to assure political legitimacy. Several methods can be used for the identification of the success of a project:

- Content analysis.
  - continuous statistical evaluation
- Interviews
  - interviews with seminar participants during training modules.
  - interviews with seminar participants after the training modules.
- Monitoring
  - observation of participants during training courses to estimate their learning success.

Culture of communication

The culture of communication which predominates in a project but also in the project environment is an essential element for the successful realisation of a project. This relates as well to the members of the project team as to the population in the region where the project has to be implemented as well as to the stakeholders who support the project.

The following questions arise:

- Is there open communication between project management and other actors in the project?
- Is project information available to all parties involved?
- Is the information understandable for non ICT actors in the project?

Sustainability phase

This phase is about sustaining and building on results, such as the new expertise and knowledge acquired by the participants or the technical infrastructures developed for the project. This depends on an evaluation of project deliverables that delivers meaningful information and on sustainable implementation of the findings by the target groups and by participating project partners.

Control and evaluation

A key element for the achievement of a sustainable project is the creation and deployment of competent organisational path structures with sufficient resources and the implementation of a series of continuous follow-up evaluative and control procedures.

All this must be ensured without neglecting another of the aims, namely to become the strategic hub for the management and transfer of knowledge generated by any of the organs carrying out the initiative, as well as for positive feedback both from them and from the agents of various other actions.

The main aims of these tools are to ensure the control, efficient management, diffusion and communication of the activities triggered by the initiative. With regard to communication, the control and evaluation tools provide access to up-to-date information about the initiative's progress. They are a useful instrument for policy makers and stakeholders wishing to disseminate statistics about the good progress of the project.

THE ERICSSON QUALITY MANUAL: POLICIES AND DIRECTIVES

Ericsson is the Contracting Partner of the Lifelong Learning Programme project *Using wireless technologies for context sensitive education and training.*

Ericsson is also the Chair of the project's Board of Management.

Ericsson has its own Quality Assurance Manual, *The Ericsson Quality Manual: Policies and Directives,* published in Stockholm in 1995.

Therefore the Quality Assurance policy of the project *Using wireless technologies for context sensitive education and training* reflects the Ericsson Quality Assurance Manual.

Fundamentals for Business Operations

The Ericsson Quality Manual is based on International Standard ISO 9901. The Ericsson Quality System reflects the concepts of TQM, Total Quality Management.

TQM is a management philosophy that focuses on:

- Customer satisfaction
- Continuous improvement
- Everyone's involvement
- Excellence in all dimensions.

These four strategies are therefore the cornerstones of the Quality Assurance Plan of the project.

TQM provides a number of tools and techniques. However, achieving TQM requires motivation, the correct attitude and an infrastructure capable of supporting TQM in practice.

The values that are held in common are:

- Professionalism
- Respect
- Perseverance

There are six basic strategies for quality:

- Focusing on the customer
- Continuous improvements
- Prevention
- Decisions based on facts
- Everyone's full participation
- Long term thinking.

These are the principles, *mutatis mutandis,* that will be used within the project to achieve quality and will be the measures used by the Board of Management to judge the quality of the products and processes of the project.

Directives and Objectives

In addition to key financial figures, the project partners will define performance indicators from a number of measurements of the performance of the project. Together these indicators reflect customer satisfaction, internal efficiency and project results. In this instance customers are defined as the project sponsor and the participants in the training developed through the project.

Management reviews primarily focus on negative deviations related to results:

- Customer complaints
- Customer satisfaction measurements
- Performance indicators and results of measurements
- Objectives
- Corrective and preventive actions
- Improvement plans.

Besides being responsible for the achievement of the project objectives, every partner is responsible for the quality and results of his or her part of the project. Among other duties, the manager must:

- Plan, control and follow up the implementation of the project
- Produce, introduce and maintain a quality plan for the project
- Ensure that the quality plan is employed by everyone in the project
- Monitor that the corrective actions decided on are effectively carried out
- Demonstrate that the project has achieved the different sub-objectives at the various decision-making points in the project
- Ensure that the project results fulfil the specified requirements
- Ensure that the necessary co-operation and resources are available.

Planning and preparation of work packages

Before a work package is started, the following will be determined:

- Which requirements are to be satisfied
- Which methods and aids are to be used
- Which equipment is to be used
- Which documents are needed
- How we are to measure and control the process
- How we shall inspect and verify it
- What skills are needed
- Criteria by which the work package will be approved.

The Quality Function has two main duties:

- Quality Assurance

- Supporting the project for the achievement of quality improvement.

It is clear that the Ericsson Quality Assurance Manual, *The Ericsson Quality Manual: Policies and Directives* is directed at quality assurance of telecommunications products and may need adaptation for use in judging the quality of courseware and reports in a European Commission project.

ROLE OF THE BOARD OF MANAGEMENT IN QUALITY ASSURANCE

The CONTSENS Board of Management plays an important role in project quality assurance.

Each product of the project is presented to the Board of Management for evaluation and approval. This is a prerequisite for the product to be approved before posting to the project website. It is a prerequisite for the product to be approved for inclusion in the Interim Report and/or the Final Report of the project.

If the product is approved by the Board of Management it is posted to the project website and included in the Interim/Final Report. If the product is not approved by the Board of Management it is returned to the partner responsible for further work and resubmission.

These decisions of the Board of Management are recorded in the minutes.

In the case of a rejection by the Board of Management the reasons for non-approval are also recorded in the minutes.

Criteria to be used by the Board of Management for reports and documents

The report or document should be of publishable standard; it has to be of sufficient quality for consideration for publication by either the online academic journals or printed academic journals.

The report or document must correspond to the presentation of the report in the project proposal as approved. The report or document must correspond to the length and level in the project proposal as approved.

Clear research questions. As in any academic report the document must address clear research questions and respond to them scientifically.

Methodology. The report must use a scientific methodology to address the question at issue.

Contextualisation. The report must focus on the context of the project or investigation.

Results. The report must draw up a series of results from the investigation reported.

Conclusions and implications. The report must draw conclusions from the investigation of value to the project as a whole.

References. The report should show a knowledge of the research literature of the question being investigated and references must be cited in the Harvard style.

Language. A check on the correctness of the language used is necessary to avoid papers being returned for revision.

Translation. Any translation requirements of the project proposal as approved must be respected.

Criteria to be used by the Board of Management for courseware and software

The courseware or software should be of commercial standard. This means that the quality is sufficient for consideration for use in the institution's prospectus of courses.

The courseware or software must correspond to its presentation in the project proposal as approved.

The courseware or software must correspond to the size, length and level specified in the project proposal as approved.

The courseware must exhibit accepted pedagogical standards.

The courseware must exhibit accepted standards of student user-friendliness.

The Board of Management will evaluate the technical quality of the product.

SPECIFIC ACTIONS RELATED TO THE WORKFLOW OF THE PROJECT

Feedback

The Board of Management shall provide feedback to the partner responsible for the product on its decisions on

- Whether or not to approve the product for posting to the website
- Whether of not to approve the product for inclusion in the Progress Report and the Final Report
- Whether or not to approve the product for inclusion in the listing of the Board of Management's approvals to be drawn up at the final Transnational Partnership meeting in London in November 2009.

Corrective actions

If the Board of Management finds that the deadline for a work package is not being respected, it will take corrective action.

This may take the form of advising the partner or partners concerned that the deadline has not been met or, *pour cause majeure* of deciding to alter the agreed deadline for the work package.

Organisational issues

The Board of Management shall assure quality control for organisational issues.

In this context it will oversee the smooth functioning of the partnership and the quality of all the processes and products of the project.

Internal communication

Quality in internal communication within the partnership will be assured by:

- The holding of three Transnational Partnership meetings per year on the premises of the partners
- The holding of regular transnational audio conferences in the months when there is no face-to-face meeting
- Detailed minutes of all meetings, both face-to-face and audio conferences, will be distributed to all the partners as soon as possible after the meeting
- The agendas for and minutes of all meetings will be posted, passworded, on the project website.
- Other communication between the partners will be by e-mail, telephone or fax.

Risk management

The Board of Management will control risk management, especially the continuity of the partnership, the quality of all processes and products and conformity to the budget.

Timelines

The timelines for the project will be decided at the inaugural Transnational Partnership meeting to be held in Dublin as soon as the project contract is signed.

Deadlines

The deadlines for all the work packages in the project will be agreed at the start of the project and monitored by the Board of Management at each face-to face and audioconference meeting.

Budget control

Each partner will be required to present statements of expenditure once a quarter.

These statements of expenditure will be collated by the Contracting Partner who will initiate corrective actions either at partner level or at partnership level.

Quality of the learning objects

Each of the learning materials in the work packages will be evaluated against accepted pedagogical and didactic criteria for mobile learning.

Quality selection criteria regarding the content

For each of the work packages each partner will be required to present a written statement on the criteria for the selection of the content for the learning materials.

This statement will detail the Vocational Education and Training (VET) focus of the learning materials.

Evaluation and testing of the work packages

For each of the work packages each partner will be required to undertake evaluation and testing of the course materials under the headings student user-friendliness, technical feasibility, didactic effectiveness and cost efficiency.

For the testing and evaluation of each work packages the partners will select Vocational Education and training (VET) learners.

These learners, on completion of the course, will be administered with a scientific questionnaire designed by London Metropolitan University, who are experts in educational evaluation.

The data from the questionnaires will be collected, collated and analysed and reports written and published on the project website.

Each partner is required to teach the course to and collect questionnaires from a minimum of 20 learners.

Each partner is required to present a report of a minimum of 10 pages on the evaluation and testing of their cohort of learners.

SUMMARY

Project Quality Control

The focus of quality control is on the deliverables of the project. Quality control monitors project milestones to verify that the deliverables are of acceptable quality and are complete and correct.

Project Milestones	Quality Standards/ Completeness and Correctness Criteria	Quality Control Activities	Frequency/Interval
mLearning Scenarios	Document with the elements of all scenarios – setting, actors, objectives and actions	Establish & document evaluation criteria Preliminary prototype feedback Team review Apply change requests	Once during initial prototype design Monthly during prototype design Once prior to each phase/interim version release conclusions
mLearning Repository Evaluation instruments	Executable system prototype, available mLearning courses Available research design, measurement instruments	Teachers' review Technical editors review Core team review	After each version release
Trials – first stage	Report on the on-going trials	Team review Apply change requests	Once after the first stage of the trials
Data report and recommendations for improvement of educational, technical and content quality	Data report Recommendations Report	Establish & document evaluation criteria Team review Apply change requests	Once after the trials
Dissemination report on the success of the dissemination effort	Dissemination report	Team review	Once three months before the deadline

Project Quality Assurance

The focus of quality assurance is on the processes used in the project. Quality assurance ensures that project processes are used effectively to produce quality project deliverables.

Project Process	Process Quality Standards/ Stakeholder Expectations	Quality Assurance Activity	Frequency/ Interval
Refine project plan	100% compliance with framework	Audit plan content and updates, project priorities, and task estimation	Once per project stage
Execute and control	95% compliance with the	Audit the following	

project per project plan	budget, refined chart and plan	project activities: ✓Quality ✓Communications ✓Project progress	 Monthly Monthly Monthly
Approve each project stage	100% compliance with the refined chart and plan	Define milestones, perform reviews at the milestones and analyze delays, reschedule tasks in case of delays or problems, use the time plan as a basis to control the work of all partners.	Once per project stage
Close project	100% compliance with the refined plan	Audit project reviews by stage	Once per project stage

Quality Team Roles and Responsibilities

The processes of the project will be managed by the project Board of Management, which will be appointed at the first Trans-national Partnership Meeting after the approval of the project and the signing of the contract.

The Board of Management will be charged with

- project administration,
- allocation of workloads, deadlines and schedules,
- budget control and authorisation of expenditure.
- quality control.

External Project Evaluator

The project has appointed the Dun Laoghaire Institute of Art, Design and Technology as the external evaluator. The evaluator will have access to all documents and products of the project. Regular monitoring meetings will be scheduled to ensure that the Evaluator has all the information required to undertake a comprehensive, independent and external evaluation.

REFERENCES

JOINT COMMITTEE ON STANDARDS FOR EDUCATIONAl EVALUATION.(1994). *The program evaluation standards, 2nd. edition*. Thousand Oaks, CA: Sage Publications.

MARTÍNEZ MEDIANO, C. (Coor) (2004). Técnicas e instrumentos de recogida y análisis de datos. Madrid: UNED. Unidades didácticas.

MARTÍNEZ MEDIANO, C. (2006). Evaluation plan of 'Distributed internet-based performance support environment for individualized learning (DIPSIEL)'. Madrid: UNED.

ROSSI, P.H. and FREEMAN, H.E. (1993). *Evaluation: a systematic approach.* Newbury Park, CA: Sage Publications

STUFFLEBEAM, D.L. and SHINKFIELD, A.J. (2007): Evaluation Theory, Models, Activities. San Francisco, CA: Jossey-Bass