INTERNATIONALISED MASTER DEGREE EDUCATION IN NANOELECTRONICS IN ASIAN UNIVERSITIES

COMPETENCE BUILDING IN HIGHER EDUCATION

573828-EPP-1-2016-1-BG-EPPKA2-CBHE-JP

Quality Assurance Plan

The NanoEl-Asia Quality assurance plan discusses the purpose, background, and the guidelines for carrying out the quality assurance processes and products.

Purpose

The document describes a set of quality assurance criteria to guide the NanoEl-Asia project activities in accomplishing high standard products and processes. The Plan provides a common conceptual ground and outlines a transperant frame of reference for the project's partners to arrive at an agreement about what it consitutes high quality project's processes and products.

Background

In establishing the set of quality assurance criteria, several quality management frameworks were consulted , namely: European quality assurance reference framework for vocational education and training, Qualifications of the European Higher Education Area and Standards, Guidelines for Quality Assurance in the European Higher Education Area, Quality Assurance of eLearning, and The European Committee For Standardisation (CEN).

At the cross-section of curriculum development, instructional design for e-learning and software design for educational and training purposes, the project conforms to the recent development of these three scientific fields. More specifically this is (a) the idea of a progressive, spiral refinement through a cyclical prototype development and stakeholders' involvement in the design and evaluation of the project's products and (b) considering evaluation not as a single phase, typically conducted in the end of the process but rather as cutting across other phases of design (needs assessment, design, development and implementation). The fact that curriculum, development, instructional design for elearning and software development approaches adopted in the NanoEl-Asia project share similar methodological background is a basis for enhancing the quality of the project products under the overarching concept of design-based research and development.

The main principle of building the NanoEl-Asia project QA framework is the triangulation of different sources of information, which are complementary to each other. They are as follows:

- Logical Framework Matrix (LFM) is part of the project proposal and relates objectives, indicators, and measures across the project activities.

- Guiding questions of the Agency for preparing the project's self-evaluation report.

- Peer review of the project's outcomes

- Internal procedure for monitoring the project's processes and activities

- External reviewer for independent evaluation of the project achievements and providing recommendation for improvement.

The next section discusses the set of more concrete guidelines for the project's QA. They have been borrowed from other projects we had participated in the past and had proven operational and manageable. For convenience, the guidelines follow the logic of the project's main thematic areas.

Quality assurance guidelines

Needs and job analyses in nanoelectronics and nanobioelectronics

1. Communicate clearly and coordinate effectively the partners' needs analysis tasks. Use predefined templates.

2. Select appropriate methods for the needs analysis data collection. Examples are: survey through questionnaires; interviews with teachers, students, employees from enterprises and educational managers; focus group with partners representatives; interview with experts; review national documents on nanotechnology strategic development; nanotechnology forecast.

3. Conduct job analysis in nanotechnology enterprises. Identify problem situations in the enterprises/research centres that can serve as cases and reference situations in the design of the high education courses.

4. Conduct domain analysis for trends in nanotechnology.

5. Investigate trends in labour market and technology development.

Curriculum development and instructional design

1. The syllabi reflects and incorporate the needs assessment and job analysis outcomes.

2. Prepare a competence matrix for each course. Formulate competences as expected outcomes in terms of behavior action and measurable standards to achieve.

3. All course syllabi implement a discovery inductive instructional design (ID) strategy. Make an internal informal training with the project's partners either face-to-face or online to explain the principles of this approach.

4. Describe all courses using a specific template (learning outcomes, entry requirements, sequence of tasks, support for tasks, assessment methods, credits). There must be consistency between the learning objectives, the ID strategy and the assessment methods.

5. Peer review of the courses. All partners are involved in critical and constructive feedback of the course descriptions..

6. All syllabi refer to European Credit Transfer System and European Qualification Framework (EQF).

7. Check existing Open Educational Resources (OER) and MOOC in nanotechnology to eventually include content or tasks from there or simply make a reference to OERs and MOOCs resources.

Course evaluation

1. Provide sufficient time (at least two semesters) for the course evaluation.

2. Draw a brief plan to guide evaluation of the courses. The plan describes the research methodology, sampling, and measurement instruments. Involve different types of participants (students, employees, teachers, curriculum designers and educational managers), different data collection methods (questionnaire, interview, software-walkthrough, observation, performance test). Include where possible a control group to compare the results.

3. Discuss the plan with the project partners.

NanoEl-Asia web-based learning environment

1. The environment provides all necessary technical affordances for supporting a discovery inductive ID approach.

2. The environment conforms to technical specifications ("build the product right").

3. Test the utility and usability of the NanoEl-Asia learning environment initially with the consortium partners.

4. Test the utility and usability of the web-based learning environment with at least five students or five enterprises/research centres employees at the partner institutions concerned ("build the right product").

Dissemination and sustainability

1. Use various channels for distributing the project results: a project web portal, information on the partner institutions web sites, conferences' presentations and workshops, journal publications, professional networks, social networks.

2. Try to present the project's results in high profile conferences where possible (an acceptance rate up to 25 %).

3. Try to publish at least two papers in an ICI (indexed) journals.

4. Use social media to promote the project's results (e.g LinkedIn Higher Education group).

5. Write a business plan for sustainability.

6. Sign an agreement between partners for further cooperation.

7. Maintain the project web site after the project's end.

Project Management

1. Describe clearly all project activities, deliverables, milestones, time frames, way of reporting, and partners' responsibilities. All these need to be discussed by partners and accepted by project's Steering Committee.

2. Establish the project's Steering Committee with a representative from each partner organization. The Steering Committee works closely with the coordinator for the operational management of the project.

3. The project's Steering Committee establishes a procedure and a set of criteria for evaluating the deliverables.

4. Set up an easy to use web-based project management environment with the necessary functionality, tools and services for managing the project. The system is checked before being opened for partners and EC agency. The system is reliable and partners feel comfortable with it.

5. **Draw a conflict resolution procedure. It includes a list of possible conflict situations, as described in each WP, steps and responsibility of the parties involved.**