



Quality system of S&T universities for sustainable industry

Final Report

Public Part

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Executive Summary

The overall objective of the project is to **promote sustainable education in the field of technical and engineering education**. Sustainable education is here defined as the integration of dimensions (in particular, economic, social, environmental) beyond technical dimensions in the engineering education.

The QUESTE-SI initiative has two scopes:

1. The **QUESTE-SI quality assurance system** consists of a set of criteria and methodological recommendations that allow the institutions to evaluate their achievements in the domain and to design and implement a progress strategy reflecting on how to include sustainability in their educational offering.
2. The **QUESTE-SI award** is conferred to the institutions after a process consisting of a self-assessment, an optional phase of guided self-development and an audit visit by a team of specially trained experts.

The project is primarily targeted towards *engineering Higher Education Institutions (HEI)* in Europe. The development of the award also contributes to a clarification and better transparency of the engineering education landscape, as sustainability is quickly becoming a key factor for the choice of a HEI. This will benefit to *students* when they select the institution, in which to pursue their studies. This will also bring benefits to *companies* when recruiting or launching cooperation with higher education institutions.

The project was managed by a consortium led by EFMD and technically coordinated by ENQHEEI, two leading academic networks in the field of quality of higher education. The consortium was composed of 18 partners from all over Europe, as well as 2 third-country partners. This allowed to take into account the diversity of the national and regional initiatives in the field of sustainable education and to guarantee the neutrality of the QUESTE-SI initiative. This is a crucial factor to facilitate its adoption all over Europe and beyond.

The professional diversity of partners also ensured that the point of view of various stakeholders was taken into account, whether HEIs, large companies and SMEs, trade unions, professional federations and associations.

The QUESTE-SI methodology was tested on a sample of eleven pilot institutions, which helped identifying, and improving different shortcomings and proposing corrective measures. This phase was very important in order to prepare the roll out of the quality assurance system and ensure its sustainability.

The QUESTE-SI project outcomes are:

- **A set of background documents**, including the analysis and comparison of international quality assurance systems.
- **A set of reference documents**, including a description of quality criteria, a referential and guidelines for self-assessment. These documents are complemented by an online platform.
- **An evaluation methodology**, allowing the institutions to evaluate themselves, to benchmark their achievements against similar HEIs and to put in place corrective actions, if needed.

- **A panel of auditors and field experts**, trained to audit the institutions and to provide them advice and guidance during the self-assessment process and the phase of guided development.
- **An awarding body**, composed of recognised authorities in the field, who is responsible for conferring the QUESTE-SI award.
- **Eleven pioneer institutions** that have gone through the entire process and have been awarded the QUESTE-SI award, hence ensuring the visibility of the initiative all over Europe and paving the way for further expansion of the network.

All reference documents, whether targeted towards the general audience or towards HEIs interested in joining the QUESTE-SI initiative are accessible on the <http://plone.queste.eu> website.

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1. Project Objectives

The overall objective of the project is to promote sustainable education in the field of technical and engineering education. In QUESTE-SI, sustainable education is defined as the integration of dimensions (in particular, economical, social, environmental) beyond technical dimensions in the engineering education.

While many individual initiatives have been taken by higher education institutions all over Europe, there is a lack of generally accepted standards for sustainable education. There is also a need for a quality assurance tool that will provide the institutions with directions and guidance on how to move towards a more sustainable education.

The QUESTE-SI initiative is structured along two dimensions:

1. The QUESTE-SI quality assurance system is a set of criteria and methodological recommendations, allowing the institutions to evaluate their achievements in the domain and to design and implement a progress strategy.
2. The QUESTE-SI is an award that is conferred to the institutions, after a process consisting of self-assessment, an optional phase of guided self-development and an audit visit by a team of specially trained experts. The award comprises four dimensions (Strategy, Education and Curriculum, Students' Involvement, Research and Innovation) and reflects the achievements of the institution in each of these dimensions, hence providing a clear and unambiguous evaluation.

HEIs expect from the QUESTE-SI award to get a public recognition of their efforts and achievements as well as an improved visibility, image and reputation. As more and more institutions are now presenting themselves as sustainable institutions, and as sustainability is turning into a competitive advantage on the educational market, this award will also provide a needed clarification on the educational landscape.

- For the higher education institutions, the objective is to offer practical guidelines and continuous advice on how to develop a sustainable education strategy and how to implement it. The QUESTE-SI project outcomes provide reference materials (referential and syllabus) and a methodology for the assessment (guide for self-assessment and online scoring grids). All these materials and resources have been tested and are now fully operational and ready to be rolled out in candidate institutions.
- The project ensured the training of qualified auditors. Most of these experts have participated in a peer review during the course of the project. Together, they constitute the resource pool that will audit the institutions and guide their development in the future.
- The project also set an internationally recognised awarding body, in charge of the awarding process of the leading institutions. The QUESTE-SI award recognises their achievements and promotes the visibility of sustainable education among the various stakeholders (recruiters and students in particular). This awarding body will work in this composition in the coming years and will carry on meeting and deciding on conferring the award. After the completion of the project, this will ensure the continuity of the award and the consistency of the evaluation procedures.

The project is primarily targeted towards engineering higher education institutions in Europe and beyond, as it provides them with guidelines and methodologies to improve their education in the field of sustainable development and social responsibility. It also offers them opportunities for guided development through self-assessment complemented by an auditing review. Ultimately, the QUESTE-SI award will enhance their visibility, improve their image and increase their attractiveness among students and recruiters (businesses).

The development of the QUETSE-SI award also contributes to a clarification and a better transparency of the engineering education landscape, as sustainability is quickly becoming a key factor for the choice of a HEI:

- Students benefit from this initiative, as it is intended to facilitate them when identifying the most advanced institutions.
- Companies willing to recruit or to launch cooperation with higher education institutions can also take advantage of this award, as it guarantees them that their potential partners have a distinguished track record in the field.

2. Project Approach

There are currently many initiatives in the field of sustainable education, as sustainability turned into a trend in the educational landscape. This makes it sometimes difficult to differentiate between “sustainable” initiatives, designed to improve the quality of education in the long run, and opportunistic moves often motivated by commercial or promotional reasons. There are also many different national or regional initiatives that are sometimes difficult to reconcile. All these factors and evolutions increased the difficulty to propose a quality assurance system. A quality assurance mechanism should not be perceived as the enforcement of a national system, as it needs to be accepted and implemented by institutions in various countries. This is the reason why the project partners opted in favour of an award, which was considered as a better-suited incentive to quality improvement than an examination-type label. Besides, the project partners decided in favour of structuring the award along four dimensions (Strategy, Education and Curriculum, Students’ Involvement, Research and Innovation). It allows the provision of a more detailed evaluation to the institutions and the precise identification of the areas for improvement. Finally, this multidimensional award appears more informative for the various stakeholders, in particular students and companies.

Respecting the diversity of engineering higher education

The project consortium includes a large number of partners coming from various geographical and professional backgrounds. This diversity was intended to avoid developing a bias in favour of a particular national system. It ensured neutrality and also guarantees that various institutions, operating in a variety of settings, can benefit from the QUESTE-SI quality improvement system. All deliverables and materials are conceived and reviewed by teams composed of international participants. Teams also include experts from various professional backgrounds. The implementation of the quality improvement process and the awarding procedure have been tested on a sample of eleven pilot-institutions from ten countries. In the selection of participating institutions, the consortium took great care to respect a geographical balance, but also to take into account the diversity of experience, having on board institutions with long history as well as “young” institutions coming from different parts of Europe. As such, the project brought added political value, and avoided any national rivalries.

Building on existing initiatives and ensuring compatibility

The proliferation of initiatives and recommendations also meant that the project necessitated an important research activity in order to identify the existing actions that have been taken in the domain, compare them and identify commonalities. This allowed the project to avoid “reinventing the wheel”. It also built on the public works and research of other institutions. This allowed the award to find its place and consistency among the other initiatives and to bring added value to HEIs and other stakeholders. In particular, some of the pilot institutions, such as Riga Technical University and Télécom Bretagne took part in the QUESTE-SI initiative in parallel or immediately before other accreditation schemes. These parallel courses allowed building upon synergies and improving the QUESTE-SI methodology.

Ensuring that the community needs are taken into consideration

As demonstrated by many initiatives in the field of quality improvement, the success of a quality assurance system ultimately depends on its acceptance and adoption. If

an accreditation is considered as enforcement from a third party, it is bound to fail. This is the reason why the project partners stress QUESTE-SI as a community initiative. This is also reflected by the composition of the consortium that includes not only HEIs, but also companies, professional associations and networks.

Both these messages were perfectly understood by the HEIs, and the project had to be slightly amended to accommodate a higher than expected number of pilot institutions. This demonstrates the appeal of the QUESTE-SI award for the institutions. Besides, one of the pilot institutions volunteered to become the representative of all project pioneer-institutions and is launching a network that will be further strengthened after the project ends.

Proposing a fully operational quality improvement tool

The project partners are aware that a fully operational quality improvement system should be created. This is the reason why all materials, as well as the methodology have been tested and validated by the pilot institutions. The geographical diversity of the pilots, their variety of specialisation have ensured that the QUESTE-SI award is operational and can be applied in various settings.

The findings and results of the testing phase were summarised and discussed. All stakeholders (auditors, quality referents inside the pilot institutions, project promoters and company representatives) had the opportunity to give feedback and suggest how to amend and improve the process. All this information has in turn been incorporated into the QUESTE-SI manuals and procedures, which will be further improved if needed when more feedback is available in the future.

In the end, a very important part of the project was devoted to the research and analysis, in order to ensure that the award will be reproducible in various settings (geographical location, discipline, specialisation of the HEI, etc.).

Ensuring the visibility of the award and its adoption by the community

The dissemination and exploitation parts of the project were central to the success of the award. Visibility proved essential to ensure the QUESTE-SI recognition and its adoption by the community, all over Europe. The diversity and geographical reach of the consortium and the presence of international professional associations and educational networks definitely facilitated the awareness building process. In particular the promotion of the QUESTE-SI award by the four international networks (EFMD, ENQHEEI, EFEED and RAAE) facilitated the dissemination and allowed an easy outreach.

The first kernel of QUESTE-SI awarded institutions will also play a crucial role in the visibility of the initiative. These HEIs will become the representatives of the quality assurance tool in their region. They are committed to showcase the benefits of the award, and to inform other interested institutions. All of them are already actively promoting QUESTE-SI and showcasing it in their communication strategies, as it is also in their own interest. A network of the awarded institutions, led by Kaunas Technical University, has recently been launched and will maintain the links between the universities, on one hand, and will be joining forces to further promote the award, on another. To this effect a first seminar will take place under the Lithuanian presidency of the European Union: pilot institutions will present the QUESTE-SI initiative and its achievements to interested institutions.

3. Project Outcomes & Results

The QUESTE-SI project aims at building a quality assurance system and an award for engineering higher education institutions wishing to evolve towards a more sustainable education. QUESTE-SI is both a quality improvement tool for the institutions and an award for the most advanced institutions. The project outcomes are:

- A **set of background documents** including the analysis and comparison of international quality assurance systems, case studies on international experiences and proceedings of specialised workshops in the field of sustainable education.
- A **set of reference documents**, including the description of the quality criteria, a referential and guidelines for self-assessment. This set of documents is complemented by an online platform.
- An **evaluation methodology**, providing higher education institutions the procedures to evaluate themselves, to benchmark their achievements against similar HEIs and to put in place corrective actions, if needed.
- A **resource panel of auditors and field experts**, qualified to audit the institutions and provide advice and guidance during the self-assessment process and the phase of guided development. All these experts benefit from a set of materials and procedures and have been trained during the project lifetime. Most of them also gained hands-on experience by participating in one or more of the 11 audit visits that took place. It is to be noted that, in addition to these core experts, auditors coming from companies have also been able to benefit from training and exposure to the procedures when participating in the audits. All the auditors have confirmed their interest in the process and have indicated that they will be willing to participate in future audits.
- An **awarding body**, composed of authorities in the field, which evaluates the institutions on the basis of their self-assessment and the results of the audit visits and decides to confer the QUESTE-SI award.
- A targeted **communication kit**, as well as specialised media, towards companies and external stakeholders (webzine, workshops, presentations and other dissemination materials), in addition to the project website that will be maintained after the completion of the project. It is to be underlined that all materials, guidelines and procedural kits are available online and fully accessible.

All materials and procedures have been tested among a group of eleven pilot higher education institutions from different European countries and from different fields of engineering expertise. This ensures the quality of the documents and procedures and their adaptation to the needs of higher education institutions, independently of their nationality or field of specialisation.

The pilot institutions constitute the first kernel of awarded HEIs, hence granting a visibility to the initiative. QUESTE-SI is now a recognised award, already conferred to prestigious institutions. These institutions are committed to further disseminate the initiative and communicate the values encompassed in the QUESTE-SI award and ultimately to contribute to its development and growth. The project consortium is also

committed to sustain this growth by disseminating information and allocating resources (such as auditors and experts for audit visits as well as organisation of these visits in future) in order to allow the continuation and expansion of the initiative.

4. Partnerships

Partnership organisation

The QUESTE-SI consortium was led by EFMD, and the technical coordination was entrusted to ENQHEEI.

Both EFMD and ENQHEEI are European networks of higher education institutions. EFMD is primarily targeted towards institutions in the field of management education and training and corporations, while ENQHEEI is a network specialised in engineering education. EFMD involvement in quality assurance dates back to its creation in 1971. EFMD has developed several quality assurance instruments, such as EQUIS and CLIP (institutional accreditations), EPAS and CEL (programme accreditation) and is considered as one of the three leading accreditation bodies in the world for management education. EFMD is also a major advocate of sustainable education, as one of the founding members of GRLI (Globally Responsible Leadership Initiative) and its contribution to PRME (Principles for Responsible Management Education).

ENQHEEI is a major network in the field of engineering and is the institution that is at the origin of the Stockholm Charter for Responsible Education.

Partnership composition

The consortium is composed of 18 members and also includes two third-country partners. Altogether 13 nationalities (in fact, many more if we take into account the members and the reach of the participating networks) are represented in the partnership. It guarantees neutrality and respect for diversity.

The partnership is composed of recognised technical institutions and networks from all over Europe. This allows to take into account the diversity of the national and regional initiatives in the field of sustainable education and to ensure the neutrality of the QUESTE-SI initiative. As national experiences widely differ, it is essential that QUESTE-SI incorporates as many best practises as possible without giving precedence to a particular national system. This appears as a crucial factor to facilitate the adoption of QUESTE-SI Europe and beyond.

Contribution of the partners to the project

The diversity of partners also ensures that the point of view of all stakeholders is taken into account, whether HEIs (through the academic institutions as well as the networks such as, EFMD, ENQHEEI, CLUSTER, GE-TH and RAAE), large companies (through EFMD and EFEED) and SMEs (CNL), trade unions, professional federations and associations (EUROCADRES, CEFI and EPC). It also ensures the equilibrium between the various points of view and approaches.

The consortium partners, which are HEIs, agreed to take part in the pilot phase of the project, on one hand to allow the testing and fine tuning of the quality assurance tool, and to enhance its visibility all over Europe, on another. The international diversity of the pilot institutions has ensured from the start the recognition of the QUESTE-SI award as European and cannot be interpreted as a national initiative.

The third country partners have played an important role in facilitating the dissemination of the project results and the adoption of the quality assurance tool in

their respective regions, which need best practices, as they face reconversion and upgrade of their educational systems.

The professional diversity of the partnership and its international exposure allowed a wider dissemination of the project outcomes, as advantage was taken of the communication channels of all partners. A large access to companies and professional organisations has been possible through the networks and professional associations, in particular through EFEED.

5. Plans for the Future

The fact that eleven institutions, instead of the eight originally planned, decided to take part in the QUESTE-SI process is an important indicator of its success and demonstrates that QUESTE-SI represents a valuable service for the HEIs.

While the HEIs will not be able to have part of their participation covered by EU funding any more, the project partners are confident that QUESTE-SI will carry on growing. The following facts support such an assumption:

- The first row of awards created a precedent. The awarded institutions are actively promoting QUESTE-SI, which will help creating an imitation factor among other institutions. This is expected to generate a snowball effect among European HEIs. All institutions have committed to use the QUESTE-SI award in their communication. Besides, a workshop, organised under the Lithuanian EU presidency will take place in April 2013, and further promote the project results.
- Other accreditation projects, such as the EPAS accreditation or the EQUIS accreditation, both supported by EU funding, also benefitted from an imitation factor and show that once a label is awarded to institutions it quickly spreads across the profession.

The pioneer institutions benefitted from reduced participation costs, thanks to the EU funding, but the follower institutions should not consider the full-cost pricing as an obstacle to the process. Experience shows that institutions are ready to pay for an assessment service that delivers value; this value stems from the evaluation received through the process, the guidance from peers and experts and the visibility and image brought by the QUESTE-SI award.

It is forecasted that more institutions will receive the QUESTE-SI award. To this effect, the consortium will carry on disseminating information, through the partners' websites and the dedicated QUESTE-SI website. The network of pioneer institutions, led by Kaunas TU, will play a crucial role in the dissemination and experience sharing. Besides, the pioneer institutions, all committed to promote the award and ensure its visibility, will also explain about QUESTE-SI and promote the initiative to their stakeholders.

All the structures put in place during the project (namely, the online platform, the trained auditors and the awarding body) will remain functional. EFEED, ENQHEEI and EFMD have signed a long-term association agreement and will ensure the secretariat of the initiative and the logistical organisation of further audit visits and awarding sessions.

6. Contribution to EU policies

The QUESTE-SI project contributes to the following EU policies for the higher Education sector:

Quality assurance of Higher Education

The goal of the project is to contribute to an overall improvement of the quality of Engineering Education in Europe by helping HEIs to integrate economic, social, and environmental dimensions beyond the traditional delivery of technical knowledge.

The quality improvement process and the QUESTE-SI award are fully in line with the Bologna convergence process and meet its focus on quality assurance. The development of quality assurance tools is one of the five items underlined for the creation of the European Area of Higher Education, as settled in the document "From Bergen to London" (7 May 2007).

Higher education contribution to sustainable development

The QUESTE-SI initiative assists the higher education institutions to take into account the issues of sustainable education and to include them in their strategies. The QUESTE-SI award will eventually contribute to a clarification of the landscape, identifying and awarding the best institutions for their achievement and acting as a role model in the field of sustainable education.

Both outcomes are intended to answer the need for a progressive and sustainable industry in the EU (2009 review EU SDS). The QUESTE-SI initiative is also fully consistent with the statement of the European Council in December 2009, which confirmed "Sustainable development remains a fundamental objective of the European Union under the Lisbon Treaty".

Interaction between academia and business

The QUESTE-SI project is also intended to facilitate the interaction between technical higher education institutions and companies. The QUESTE-SI award will bring a clarification, as well as a guarantee seal, for the recruitment and the development of cooperation between companies and HEIs. This will in turn help the students and newly graduated engineers to extend their potential in terms of personal development and employability.

Improving the quality and relevance of higher education

QUESTE-SI aims at the development of innovative curricula and programmes that will encompass not only the traditional technical dimensions of engineering education but also social, economic and environmental dimensions. The QUESTE-SI quality improvement system also extends its reach to the research activities of the institutions, ensuring that teaching programmes are updated and continuously improved. As such it participates in the continuous improvement of quality of teaching and learning, which is at the core of the Bologna process.

Multi-stakeholders approach

The project adopts a multi-stakeholder approach including partners from different educational and professional sectors. HEIs and Engineering schools are of course very well represented in the partnership, but the project consortium also reserves an

important place for professional networks, academic networks, companies and SMEs as well as professional associations and federations all over Europe.

Finally, while the project primarily has a European perspective, third country partners are closely associated to the project in order to facilitate its extension to other geographical zones.

