

Guidelines for HEIs
for enhancing Quality Assurance and
Assessment strategies
in line with FRAMELOG
(O3-A2)

Effebe Association

October 2018

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1. Introduction

The FRAMELOG project aims to contribute strongly to enhancing cooperation between higher education, research and business in the logistics sector, by incorporating European recommendations in the field of higher education, lifelong learning and work-based learning methodologies.

To reach this aim, Partners already developed a Compendium that includes concrete examples of good practices related to the successful implementation of the Knowledge Triangle in the logistics and supply chain management area in particular.

Based on these good practices, Partners defined what will be nominated as 'FRAMELOG' – a specific Framework for implementing the Knowledge Triangle in the chosen area. This Framework includes a series of instruments and tools:

- a. Specific criteria and indicators for the knowledge triangle through an online self-assessment tool addressed to Higher Education Institutions (HEIs)
- b. Methods and instruments for enhancing the communication among HEIs, Research Institutions and industry
- c. Stakeholders' Engagement Plan that explains who should be involved in the knowledge triangle, in which manner, with which objectives.
- d. Guidelines for efficient implementation of Framework

Considering FRAMELOG, the following Guidelines are aimed at giving concrete support, in particular to HEIs, on the implementation of Quality Assurance and Assessment strategies in line with The Framework developed within the Logistics and Supply Chain Management area.

Based on the Challenges mapped in O3-A1 and classified in four main phases according to the Deming Cycle (PLAN, DO, CHECK, ACT), the Consortium has developed the most relevant guidelines with relative examples and explanations to support their application.

A step-by-step approach will direct HEIs in easily identify the most effective solution for solving FRAMELOG's challenges and for improving the Institute's system of Quality Assurance and Assessment through enhanced cooperation between HEIs, Companies and Research Centres.

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2. Quality Assurance and Assessment within the FRAMELOG

The 'Knowledge Triangle' approach refers to the need to establish solid cooperation strategies between the three main actors which are involved into the innovation process: Higher Education Institutions, Business and Research. Such an approach, in fact, can guarantee the enhancement of transparency and mutual trust mechanisms that positively affect not only the Quality of Higher Education, but also the labour market's access and competitiveness as well as its innovation.

In particular, the relevance of assuring and assessing Quality of education in the area of Logistics and Supply Chain Management is urgently required by the challenges deriving from the technological innovations and customers' behaviour. Within this evolution process, FRAMELOG developed by the project emphasizes the need to guarantee high level of Quality Assurance as a necessary precondition for the effective implementation of the Framework.

Quality Assurance and Assessment, in fact, applied to 'Knowledge Triangle' in the Logistics and supply chain management area lead to:

- the increase of interactions between all the actors of the Triangle
- the awareness of being involved into a commonly shared framework
- the heterogeneity of approaches that improve the level of Quality Assurance and Assessment systems adopted in the Logistics and supply chain management area
- bridging the gaps between strategies and goals within the educational, research and labour market
- the practice of Quality Assurance and Assessment mechanisms within the Logistics and supply chain management area.

In this sense, the following guidelines provide a map for Higher Education Institutes to effectively apply and improve their Quality Assurance and Assessment systems within different aspects of HEIs' life (e.g. curriculum design, staff recruitment, delivery methods, assessment, etc.), through a comprehensive approach aimed at rapidly responding to changing educational, working, research needs of Logistics and Supply Chain Management.

3.Guidelines implementation

For each challenge identified in O3A1 we provide practical guidelines

3.1. Guidelines for the challenges identified in the PLANNING phase

Challenge 1: Integrate the Knowledge Triangle in Quality Assurance Policies and QA Culture

Guidelines:

A.Include Quality Assurance in the HEIs, Business and Research Institutes' strategic objectives and vision

In order for an organization to build a strong quality assurance culture, it is necessary that the organization's scope and policy at macro level include clear indications to it.

Therefore, for guaranteeing the quality of their educational activities, HEIs, companies and research organizations are expected to make direct reference to Quality Assurance when defining their strategic objectives and the vision.

Practical guidance:

- Define a Policy Statement including Quality Assurance as key principle in the core values and Vision of the organization (e.g. refer to: 'quality education', 'education relevant for the labour market')
- Develop an Organizational Chart, a diagram that illustrates the structure of the organization and the relationships and relative ranks of its parts and positions/jobs (often called organigram). In this chart it is important to integrate the quality process as well
- Define Strategic objectives, that represent intermediary and incremental advances within the overall strategic plan in reaching the strategic goal regarding the implementation of quality education
- Define Quality objectives that aim at guaranteeing the conformity to requirements, at facilitating the effective deployment and improvement of the quality management system (QMS) at organizational level

Example:

Define your own supply chain(s) in conjunction with your industry partners. Include supporting partners in HEIs and research institutions that provide educational and consultancy services. These partners can contribute to the efficient management of knowledge flows in the supply chain.

B.Engage HEIs governing bodies in the definition and concrete implementation for the QA within FRAMELOG

In order to build a culture of quality for the educational programmes provided by HEIs, it is necessary to guarantee the actual involvement of the governing bodies in the definition and implementation of Quality Assurance within FRAMELOG.

It is highly relevant that quality is shared by the top management and further disseminated to the organizations' staff at all levels.

Practical guidance:

- The Top Management is aware of the QA principles and opportunities and support quality implementation within FRAMELOG
- Governing bodies provide actual support for ensuring the quality of educational offer in line with FRAMELOG (e.g. provide necessary resources, disseminate quality principles, collect feedback from key stakeholders, etc.)
- Quality is being monitored periodically by the top management and continuous improvement is guaranteed

Example:

Describe the value of a culture of continuous improvement within supply chain and other organisations.

C. Develop joint Quality Assurance procedures and tools within FRAMELOG

The key focus of FRAMELOG is the 'cooperation' among the relevant actors: HEIs, companies from the logistics and supply management area and research institutions. Therefore, this cooperation is expected to be not only a general agreement, but also a practical approach to ensure the quality and relevance of the educational programmes.

After having defined the quality objectives and strategies, it is important that HEIs engage also the other players in defining and implementing concrete quality processes.

Practical guidance:

- For each quality objective define specific performance indicators, implementation procedures and tools, taking into consideration also the quality standards implemented by the other players (business and research)
- When defining the specific procedures and tools, indicate also the role of the other players and how they should be involved in the precise quality activity
- Based on the feedback received from the business and research institutions, continuously update and improve the quality procedures and tools in order to be in line with their quality requirements

Example:

Benchmark your organisation and learn through good practice; set up a benchmarking club encompassing the wider FRAMELOG participants.

Challenge 2: Plan a methodology/procedure for the creation of a sustainable network of relevant stakeholders

Guidelines:

A. Develop and maintain a sustainable network of stakeholders to be engaged in FRAMELOG

Specific recommendations for setting up a Stakeholders' Engagement Plan have been provided in O2 A3. This guideline is mainly referred to 'how to ensure the sustainability of the network'.

Formal agreements between HEIs and business and research represent one of the key principles of the FRAMELOG. In order to guarantee quality and relevance of the educational programmes, it is highly important that this collaboration is a 'long lasting' practice rather than 'on the spot' action.

Practical guidance:

- Define specific objectives and indicators for the involvement of stakeholders into QA of the HEIs and the offered educational programmes (e.g. in which quality areas and to what extent the different stakeholders should be involved, how many of them, typology of stakeholders, impact envisaged on the educational programme, etc.)
- Continuously monitor the state of art concerning the involvement of stakeholders into QA of the HEIs within FRAMELOG
- Implement appropriate measures for ensuring long collaborations with stakeholders (e.g. based on their feedback, adjust the educational programmes, the collaboration processes, etc.)
- Promote collaborations (e.g. through website, dissemination materials – leaflets, publications, etc., public presentations, etc.) and their results internally and to wider public in order to ensure visibility and recognition
- Use the FRAMELOG Case Studies of Good Practice to help identify, build and sustain a network of stakeholders.

Example:

The Novus trust link with the University of Huddersfield, a partnership between major companies across a wide range of business sectors that recognise the need to reinvent the way in which the supply chain profession finds and prepares its future leaders (www.novus.uk.com).

B. Organize periodical events for sharing educational results achieved within FRAMELOG

Since FRAMELOG is based on the principle of 'cooperation' for ensuring higher quality and relevance of the educational programmes provided by HEIs in the logistics and supply chain management area, the organization of periodical events represents a key recommendation for supporting the actual implementation of FRAMELOG.

When and which type of events should be organized, depends mostly on the specific context and requirements, such as: lessons and assessment calendar, availability of key players, trends and innovations in the logistics and supply chain management area, etc.

Practical guidance:

- Agree (together with the key players) an Annual Plan for events, indicating: type of event, objectives of the event, targeted audience (qualitative and quantitative indications), venue and date, marketing strategy
- Engage companies and research institutions in the organization of each event, based on their specific professional profile, interests and availability
- Promote these events and stakeholders' involvement widely, in order to give visibility and recognition at local, national and international level
- Assess the results of these events (through questionnaires, interviews) against the envisaged objectives and take measures for further improvements
- Disseminate the positive results achieved through these events with the objective to motivate stakeholders to support these type of cooperation activities.

Example:

Together with key stakeholders, organise an event as part of the annual 'European Supply Chain Day' to raise awareness of the value of logistics and supply chain activities in people's everyday lives (www.supply-chain-day.com).

Challenge 3: Ensure appropriate human (specialized, updated and trained staff) and material resources (facilities, infrastructures and technologies) for FRAMELOG implementation

Guidelines:

A. Appropriate selection and training of staff in relation to FRAMELOG implementation

It is important that the quality of teachers is in line with the labour market and research demands and with the level of students that need to be improved permanently. Therefore, investment in guaranteeing appropriate professional competences of the HEIs' staff is necessary.

Quality of education through successful implementation of the FRAMELOG depends on highly qualified Professors. Therefore, highest possible care should be applied on the selection and training of Professors and other HEIs staff.

Practical guidance:

- Define selection criteria and objectives based on the educational programmes designed in collaboration with companies and research institutions from the logistics and supply management area
- For the selection of staff set-up specific quality standards (e.g. study title, qualifications, experience, etc.) that refer to their qualification and/or to the professional experience
- Support professional training of the staff, in collaboration with the key players and based on the permanent update of the educational programmes and on the innovations occurred
- Encourage teaching staff to join their national Logistics Association and participate in the activities of the association to ensure their continuing professional development (CPD) is current and relevant

Examples:

- Encourage teaching staff to seek individual accreditation through the European Associations in the field
- Use resource planning software to optimise the cost effectiveness of operations.

B. Active involvement of business, research actors and public institutions for the provision of appropriate resources for the organizations involved in the Educational Process, particularly HEIs.

In order for HEIs to provide quality educational programmes it is necessary to ensure appropriate resources, in terms of experts, logistics, updated contents of the educational programmes, innovative teaching methods, financial support, etc. These can be obtained through various actions and with the support of several stakeholders, according to their professional profile and role. In particular, these resources can be obtained through projects financed at local, national, European and international level; through direct support from the business and research sector; through private funding from private and public institutions, etc.

It is necessary to underline that these resources are not only financial resources, but can also be translated into logistics, equipment, professional expertise.

Practical guidance:

- When planning educational programmes (within FRAMELOG), indicate also the resources needed and how HEIs are expected to obtain them also with the support of external stakeholders
- Train HEIs staff (through customized training programmes, conferences, seminars, meetings with policy makers and financing bodies, etc.) to design and manage projects in the field of higher education, financed by private and public institutions/organizations
- Involve companies, research and public institutions in educational programmes, in order to motivate and to give them the opportunity to have an active role in supporting education in the logistics and supply chain management area

Example:

Promote the support received in order to obtain public visibility and recognition for the quality of the educational programmes, achieved through active collaboration with key players.

C. Set-up cooperative learning environment within FRAMELOG for supporting innovation in the logistics and supply chain management area

The way learning takes place nowadays is very different in respect to 10-15 years ago not just in terms of contents (that are changing continuously), but mainly in terms of methodology.

We are now facing the 'learning output' approach that focuses more on the learning achieved and less on the transmission of knowledge from teacher to the student.

Logistic and supply chain management area is a dynamic context with relevant changes in terms of content and concrete tasks to be implemented. Therefore, educational programmes must be customized in order to provide the appropriate knowledge, skills and competences as requested by the labour market and in line with the trends in the research activity.

Effective learning takes place in cooperative environments where teachers act more as mentors/facilitators and students learn together from each other. The efficacy of this kind of learning is ensured mainly because the labour market is very interested not only in specific technical skills, but also in skills such as: team work, communication, leadership, learning to learn, active listening, giving and receiving feedback, critical thinking, etc. The last ones are fundamental skills that can guarantee continuous professional development of the future employee and imminent growth for the company.

Practical guidance:

- In order to create a cooperative learning environment, it is important to refer to FRAMELOG in each phase of the educational programme (planning, delivery, assessment and evaluation, improvement)
- Teachers must be trained to facilitate cooperative learning, involving also researchers, professionals from companies that can contribute with their specific expertise
- Technical instruments should be available in order to facilitate cooperative learning (e.g. equipment, platforms, software, etc). These can be provided not only by HEIs, but also by the research institutions and companies active in the logistic and supply chain management area, based on collaboration agreements.

Challenge 4: Align the contents, programmes, lecturers, educational methods with business requirements and innovative results from research

Guidelines:

- A. Integrate the inputs received from the business and research sectors for defining joint education and training activities

FRAMELO's main aim is to enhance the cooperation among HEIs, research institutions and companies in the logistic and supply chain management area. In the previous guidelines we indicated various ways of collaboration for improving the quality of educational programmes through the implementation of FRAMELOG.

It is very important that all the feedback, suggestions, recommendations received from the key players in the occasion of the different collaborative actions, are deeply analysed and integrated in the HEIs activity in order to guarantee quality and relevance of the educational programmes.

Practical guidance:

- HEIs should be prepared to collect the input received from the stakeholders, research institutions and companies in particular, through specific analysis instruments (e.g. questionnaires, interviews, face to face discussions, round tables, etc.)
- The input received must be analysed carefully in order to extract the most relevant adjustments needed for enhancing the quality of the educational programmes

- Before making the specific integrations to the contents, programmes, lecturers, educational methods, check with the key players and make sure they are the most appropriate
- Continuously improve educational programmes by integrating the input received from stakeholders with the ultimate objective to provide high quality educational programmes and to enhance students' employability competences.

Example:

Connect and build links with key logistics organisations' research facilities such as DHL and Proctor and Gamble research facilities (www.dhl.com/en/about_us/innovation/dhl_innovation_center.html) (www.pgscience.com/home/rd.html).

B. Periodically check the validity of the curriculums based on the labour market/research trends

The sustainable implementation of FRAMELOG should allow for permanent cooperation among HEIs, businesses and research institutions. The results of this cooperation should be evidenced in the educational curriculum that is expected to be always up to date and in line with the labour market needs.

However, adjustments in the curriculum should not be made without a specific planning in order not to create misunderstanding for students and HEIs staff in particular.

Practical guidance:

- The implementation of the different cooperation activities, as indicated in FRAMELOG, should be planned on periodical basis (e.g. annual) and specific objectives should be defined in relation to these activities
- Eventual revision in the curriculum must be discussed with key players and communicated to stakeholders (internal staff, students, wider public, businesses, research organizations, public institutions, etc.)
- The results of the discussions occurring during the cooperation activities (e.g. bilateral meetings, roundtables, public events, working groups, focus groups) should be collected in shared reports and then implemented in the educational curriculum
- The adjustments to the curriculum should be done periodically – the exact period can be established when the curriculum is being designed (could be every year, or more, also considering the dynamics on the labour market and in the research field)
- Stakeholders should be informed about the innovations that have been made in the curriculum in order to keep them up-to-date and to demonstrate the relevance of the educational programmes.

Example:

Connect with applied research networks such as the Logistics Research Network in the UK and Nofoma in Scandinavia for their annual events and publications informing of latest applied research collaborations between logistics practitioners and logistics professionals (<https://ciltuk.org.uk/About-Us/Professional-Sectors-Forums/Forums/Logistics-Research-Network>) (<http://www.nofoma.net/>).

Challenge 5: Learning is student-centred and managed in collaboration with key players

Guidelines:

A. Engage students in the training needs analysis with regards to logistics and supply chain management area

The quality of education benefits students who are expected to build relevant competences for professional development. Key players (HEIs, companies in the logistic and supply management area, research institutions) are responsible for guaranteeing this quality and at the same time, they are also beneficiaries as well. The implementation of FRAMELOG represents a concrete instrument that facilitates the cooperation among these players for enhancing the quality and relevance of the educational programmes.

However, the efficacy of the educational programmes depends very much of the learner's participation and motivation. Considering the EQAVET indicators, quality education means that it is available to all learners irrespective of their individual specific needs.

Practical guidance:

- Based on the feedback received from students, HEIs should be ready to provide more individualized education programmes (through teacher training, equipment, logistics, etc.). Through cooperative learning, students will have the possibility to express their opinions regarding the educational programme (contents, delivery, assessment, etc.) and the fact that their input is being considered will represent a very strong motivational instrument for enhancing the quality of learning
- Engage students in all phases of education in order to make them feel 'co-owner' of their educational process (in the 'Plan' phase they can provide input regarding the educational materials, the delivery methods and approaches; in the 'Do' phase they can provide feedback regarding the impact and efficiency of the specific delivery approaches and can provide suggestions for adjustments; in the 'Check' phase they can provide feedback regarding the relevance and efficacy of the assessment methods and tools; in the 'Act' phase they can indicate which can be the most relevant revisions needed)
- HEIs should be ready to collect this input and analyse it, also in relation to the feedback received from other stakeholders, in order to further improve the quality of the educational programmes within the FRAMELOG
- Promote the input collected from students and the revisions made based on this in order to motivate students to be active in their learning process.

Example:

Learn from the network of European Students of Industrial Engineering and Management which exists to foster relations between students and is supported by industrial sponsors (<https://www.estiem.org/default.aspx>).

B. Active involvement of the business and research sectors in the analysis of learning needs

The implementation of FRAMELOG represents a concrete instrument that facilitates cooperation among the key players in the logistic and supply chain management area. This collaboration should be present in all phases of education and at all organizational levels.

Practical guidance:

- Organize/ participate in activities that allow HEIs to better understand and define the labour market needs in terms of knowledge, skills and competences (e.g. round tables, scientific papers, conferences, etc.)
- Select the most relevant players to provide input for defining the learning needs to be addressed through the educational programme (in particular businesses and research institutions). The players must be chosen based on their impact in the research and industry context. They could be: companies, research institutions, agencies that conduct studies regarding the trends in the logistics and supply chain managements areas, high level experts in the area, etc. they could be involved either through public events or through bilateral/group-work meetings and discussions
- Based on the input received, define a list of learning needs and ask for final clarifications (from key players), if necessary.

Example:

- Include the defined learning needs in the educational curriculum and periodically update them Erasmus University Rotterdam participation in SmartPort is an example of collaborative approach to student centred learning. SmartPort@Erasmus is a centre of excellence offering port related education and research and connects students, academics and practitioners to focus on future challenges, the dissemination and application of port related know ledge.
(<https://www.erim.eur.nl/smartporterasmus/>).
- The University of Arkansas Innovation Center is the catalyst for the formation of a collaborative community of companies and faculty, linked interdependently in research and development focused on core competencies including supply chain, distribution, logistics and multi-modal transportation and where students work on company sponsored projects (<https://artp.uark.edu/innovation-center/>).

Challenge 6: Apply a competence-based approach to teaching/training

Guidelines:

A. Define competence-based education and training activities

It was underlined before that we are now facing a 'learning output' approach that focuses on the results of learning rather than on the time and information provided. This approach means that learning is expected to be assessed not only through the knowledge acquired, but mainly through the skills and competences built. Therefore, the learning activities must also be designed and implemented in order to build and asses specific competences related to the knowledge acquired.

Practical guidance:

- When defining the learning outcomes, refer to European/national/regional frameworks regarding academic education and professional qualifications. Normally these frameworks provide concrete definitions and requirements regarding what knowledge, skills and competences represent
- Define and assess the learning outcomes in terms of knowledge, skills and competences. It is highly important that the assessment is being made in relation to all the learning outcomes defined
- Design educational activities that enable students to practically develop skills and competences (e.g. through experiments, laboratories, internships, simulations, role play, etc.)

Example:

Use the European Logistics Association (ELA) Logistics Standards of Competence as a basis for the development of curricula. These standards of competence have been developed by logistics and supply chain professionals for the logistics profession and are updated on a regular basis to ensure currency (<http://www.elalog.eu/elaqf-qualification-standards>).

B. Set-up work-based assessment procedures and tools

One of the FRAMELOG implementation objectives is to improve the quality of the educational programmes in the logistic and supply chain management area for enhancing the employability opportunities for students. In order to reach this objective, it is necessary to ensure that the different educational phases are in line with the labour market requirements. In particular, since the learning outcomes are defined also in terms of skills and competences, it is important to accordingly assess them. This approach will guarantee quality and relevance of the educational programme for the labour market in particular.

Practical guidance:

- In relation with the learning outcomes defined, design appropriate assessment methods and tools that involve in particular the labour market actively. We consider as appropriate those tools that allow for accurate evaluation of the specific learning outcomes (K, S, C), involves the key players relevant for the specific topic (also depending on the delivery process) and provides precise evidence for future recognition
- Train teachers, HEIs staff and company personnel to manage the organization of this type of assessment and the evaluation results
- Periodically update the assessment methods and tools, also in relation with the updates in the educational curriculum and based on the companies' input.

Challenge 7: Obtain accreditation for the course

Guideline:

- A. Check compliance and conformity of the courses according to regional/national/European standards

Based on Cedefop's definition¹, **accreditation of an education or training programme** represents a process of quality assurance through which a programme of education or training is officially recognised and approved by the relevant legislative or professional authorities following assessment against predetermined standards.

Especially when it comes to higher education there are specific quality standards defined at regional/national and European level and they are mandatory and rather different across Europe.

Within FRAMELOG it is necessary to underline the need to connect the academic sector with business and research therefore, besides official accreditation, it is necessary to highlight the need to address also competence standards defined by other bodies, such as professional associations, companies, etc.

Practical guidance:

- When planning an educational programme, search for the most relevant accreditation and recognition opportunities, in order to provide high level education and real job opportunities for students
- Involve experts from the professional organizations in the curriculum design team by inviting them in working groups, consultation meetings, discussion about learning strategy and objectives
- Stay informed about new opportunities for recognition of training curriculum by the labour market

Example:

- Further to developing the ELA Qualification Framework, ELA has recently developed and deployed an accreditation process for HEI curricula in logistics and Supply Chain Management. The accreditation process is based on mapping the contents in the University curricula against the Standards of the ELAQF and "grading" the contents in terms of relative coverage of the ELA Standards.
- Certified in Production and Inventory Management (CPIM), Certified in Supply Chain Professional (CSCP) and the Certified in Logistics, Transport and Distribution (CLTD) of The American Production and Inventory Control Society (APICS)
- Mastery Model and Certified Professional in Supply Management (CPSM) of the Institute for Supply Management (ISM)
- The Chartered Institute of Logistics and Transport -CILT - is a professional body for logistics professionals. A key activity of the institute is to accredit university degrees as meeting the requirements for the highest level of membership of the institute which is Chartered Membership.

¹ Terminology of European education and training policy, Cedefop, 2014

3.2. Guidelines for the challenges identified in the DO phase

Challenge 8: Ensure continuous and aligned with business professional update/development for teachers and trainers

Guidelines:

A. Support and facilitate continuous training of staff in line with the market and research trends, in the logistic and supply chain management area in particular

Staff training is considered to be a key element to ensure the quality of education programmes. For this reason, it is important to monitor and support it constantly in all phases of education, not only in the planning stage. The logistic and supply chain management area registers dynamic changes and therefore it is highly relevant to be ready for continuous professional update of the staff involved in the educational processes.

Practical guidance:

- Train the HEIs' staff in order for them to have the capacity to collect updated information about the innovations that take place in the labour market and research exploiting the cooperation activities that engage directly these environments
- Set-up joint monitoring systems (e.g. studies, industry analysis/statistics, etc.), in collaboration with business and research actors, that allow the identification of future changes and trends in order to be able to anticipate the competences needed
- Provide support, for professional update of the staff on the innovations that occur in the industry during the delivery of the education programmes
- Motivate staff to collaborate with business (consulting, mobility, joint research, etc.) also through providing attractive incentives.

B. Involve business and research in the updating and training activities for teachers and trainers

Despite eventual financial support that HEIs might need in order to enhance the professional training of their staff, the direct engagement of business and research brings much more benefits: up to date and field work information, practical approach, business/research contextualized training, enhancing sustainable cooperation between these three players (HEIs, business, research).

In order to ensure quality of education within FRAMELOG it is highly relevant the participation of the business and research sectors in the professional update of HEIs staff, in all phases of education, based on the innovations trends registered in the industry (such as: IoT, Industry 4.0, Artificial Intelligence, Cyber Physical Systems, Intelligent Transportation Systems, etc.).

Practical guidance:

- Considering the cooperation agreements, facilitate the involvement of business and research organizations in the permanent training of the staff, in particular in relations to industry innovations and trends from the technical and organization perspective
- During the delivery activities of the educational programmes, through cooperative approaches create occasions for professional update for the staff (e.g. meetings with experts from the logistic and supply chain management area, availability of up to date research results, etc.)

Example:

Encourage teachers and trainers to join their relevant national logistics professional associations with a focus on continuing professional development to ensure currency and relevance of logistics knowledge (<http://www.elalog.eu/members>).

Challenge 9: Learning takes place mostly through experimental and innovative practices/experiences in line with market needs and technical innovations

Guidelines:

A. Include appropriate practical learning activities and work-field applications in the training delivery's methods and tools

The logistic and supply management area requires very practical skills and competences and therefore it is crucial to deliver educational programmes mainly through practical exercises and experiments. This approach not only will provide higher motivation to students and will facilitate learning, but will also allow students to build solid technical competences required by the industry.

Practical guidance:

- Prepare HEI staff to be able to implement the most innovative teaching methods that are mostly based on approaches such as: cooperative learning, flipped classroom, experimental learning, etc.
- Even when education is already taking place based on the initial planning, search for new pedagogies and teaching methods that may appear in order to improve the learning process
- With the support from the business and research organizations, make sure that all the theory is being explained through practical and experimental learning and work-field applications.

Examples:

- The Logistics Lab Montanuniversitaet Leoben University in Austria serves as an interdisciplinary center for research and development. Companies supported the establishment of a logistics lab at Montanuniversitaet Leoben university by providing technology and software (<https://www.unileoben.ac.at/en>)
- 'Business on the Move' is an educational board game designed to excite and inspire players of all ages about business and global supply chains giving young people an opportunity to gain a real insight into the exciting world of logistics and supply chains through learning activities have now been developed in partnership with the logistics organisations who have sponsored the game (<https://www.businessonthemove.org>)
- The Logistics Institute at the University of Hull built a virtual game to create logistics awareness in young people using the XBOX Kinect platform in order to generate higher levels of logistics awareness among school age children (www.hull.ac.uk).

B. Involve business and research in order to facilitate direct contact between students and technical innovations present in the labour market and research fields

FRAMELOG means cooperation, exchange of experience and joint activities implemented with several concrete objectives. One of these objectives is to enhance the employability competences of HEI students and prepare them for the industry requirements. In order to achieve this the cooperation at institutional level of the three key players is a mandatory precondition. However, learning cannot be 100% standardised and students should always be put at the centre of the learning in process in order to achieved maximum efficiency of education. Therefore, it is highly relevant to involve students and put them in direct contact with the industry and with the research organizations.

Practical guidance:

- Based on the cooperation agreements, during the delivery of the educational programme, facilitate direct contact between students and the specific technologies used by the business and research organizations (e.g. through stages, internships, demonstrators, etc.)
- Give students the opportunity to practically use the existing technology with the possibility both to develop related skills and competences and to contribute to research activities.

Examples:

- The Technical University Wildau and the Brandenburg Technical University Cottbus - Senftenberg are working together to develop an Innovation Hub for new developments in knowledge and technology and which will act as an intermediary for business and civil society (<https://www.th-wildau.de>)
- The Logistics Institute at the University of Hull is working in conjunction with the World Economic Forum Global Agenda Council on the Future of Logistic and Supply Chains to produce an innovative report on the impact of the Internet of Things (IoT) in the logistics and supply chain industry (www.hull.ac.uk).

Challenge 10: HEI's overall organization include appropriate opportunities for cooperation among HEIs, business and research

Guidelines:

A. Implement the stakeholders' engagement and communication strategies

On the basis of the cooperation agreements, HEIs need to continuously stay active in implementing the concrete agreements and communication strategies. This is necessary both for fulfilling their obligations (foreseen in the cooperation agreements) and for enhancing their network of stakeholders by demonstrating reliability and professionalism.

Practical guidance:

- Monitor permanently the implementation of the specific actions indicated in the agreements established with the stakeholders and take the necessary measures to guarantee their complete accomplishment (e.g. keep continuous communication with the contact persons involved in the

agreements, show the negative impact on the educational programme in case the cooperation agreements are not respected by all parties, etc.)

- Promote to wide public the network of collaborators from the business and research contexts in order to gain trust and recognition for their educational programmes at local, regional, national and international level
- Stay active in searching for new cooperation opportunities and enlarge the network continuously.
- Establish a dedicated university office for cooperation with external partners such as KTO (Knowledge transfer office) in order to facilitate the communication
- Standardize the procedures for selecting partners, communication with them, reaching agreements, etc.
- Create such a collaboration process that favors the linkages with business, e.g. improve the processes and make them less bureaucratic
- Agree expectations, manage and monitor collaborative stakeholder relationships.

Example:

The establishment of Science Park Jönköping at Jönköping University provides support for the start-up, development and growth of business ventures. The students can access the resources Jönköping University or start and develop a new enterprise free of charge (ju.se/en.html).

B. Appropriate implementation of joint education and training activities

During the previous project activities, it emerged that fact the one of the difficulties HEIs have is not only to set-up cooperation agreements with business and research organizations, but to keep them alive in a sustainable manner. In some cases, this is also due to the fact that the implementation phase is not always monitored and supported appropriately by all involved sides (HEIs, but also from the research institutions and business).

Practical guidance:

- Apply monitoring processes that allow the key players (HEIs, business and research organizations) to constantly be informed about the actual implementation of the joint education and training activities during the delivery phase (e.g. online tool that allow the key players to be informed about the delivery activities and their impact, about the assessment results, students' satisfaction and interest in the specific educational activity, etc.)
- While delivering education through cooperation activities implement corrective measures in necessary, in order to guarantee the quality of the learning process within the FRAMELOG. For example, if during the delivery of the education programme the key players notice that the results of the formative evaluations show a low level of learning achieved by students, they should discuss and analyse further these assessment results for understanding the reason and take the improvement actions. Moreover, if during the delivery phase, relevant technical innovation is taking place in the industry, it is necessary to adjust the educational programme (in terms of contents and delivery methods) so that students can learn about the most recent innovations available.

Examples:

- ‘Logistics Start-up Days’ are a regular feature bringing together Kuhne University students, professors and start-ups from the area of transportation and logistics (<https://www.the-klu.org/>)
- The ‘Global Student Challenge’ aims to bridge the gap between the academic and corporate sector and to address the need for knowledge and product development in the area of supply chain finance. A second challenge is the ‘Cool Challenge’ is a web-based business simulation providing insight into the complexities and interdependence of supply chains operating under uncertain and volatile market conditions (<http://tfcstudentchallenge.org/>).

3.3. Guidelines for the challenges identified in the CHECK phase

Challenge 11: Develop longitudinal graduate tracking system: conducting effective joint data collection and analysis (e.g. market needs, unemployment rates, completion and placement rates)

Guidelines:

- A. Evaluate the learning method and tools’ effectiveness against the labour and research needs

HEIs should engage business and research organizations within the FRAMELOG for gathering and analysing relevant data in order to be able to assess the level of quality of the educational programmes. This data should refer in particular to: completion of the education programmes, impact of the method and tools implemented on the learning process and results, placement rates, student readiness for further learning, level of employability skills, etc.

Practical guidance:

- Based on specific performance indicators set-up in the planning phase, asses the quality of the methodological approach and tools used within the educational programme
- Involve business and research organizations, as well as students and other stakeholders that participated at the educational programme in the assessment
- Collect and analyse the input received and make the necessary revisions in order to ensure the quality and relevance of the education programme and to strengthen the FRAMELOG implementation.

Examples:

- Use demand forecasting techniques for planning and decision making; use historical data to identify patterns which are likely to continue and use mathematical models to predict future demand
- Use advanced analytics to turn information into action to identify optimal courses of action.

B. Assess training effectiveness (use of acquired competencies in work-field context – through survey/interviews with companies and research organizations)

The employability opportunities and the economic growth of the logistic and supply chain management area depend both on the capacity of students to put into practice the skills and competences build within the education programme. Therefore, the assessment phase should refer not only to knowledge, skills and competences acquired, but mainly on the capacity of the student to use them in a work-field environment (e.g. in case of internships, stages, work-based learning programmes, etc.).

The implementation of FRAMELOG facilitates sustainable cooperation among the key players (HEI, companies and research institutions) and therefore, allows HEIs to measure periodically the effective application of the learning outcomes in a work-field context.

Through the various cooperation activities indicated in Framework it is necessary to collect also information about which competences students can really use in the work-field activities and with which results.

Practical guidance:

- Apply assessment instruments that can provide relevant data regarding not only the competences built, but in particular the students' ability to use them in work-field environments
- When organizing cooperation activities, in particular face to face meetings, interviews, roundtables, focus groups, ask questions regarding: e.g. which competences students actually use in accomplishing their tasks in the work-field context, with which results they use these competences, which are the missing competences if any, etc
- In addition to these cooperation activities, it is necessary to conduct also structured surveys/interviews that will allow more relevant and comparable data on this issue.

Example:

UNWE (University of National and World Economy) work with a consortium of stakeholders including non-profit sectoral and professional organisations, manufacturing and commercial companies with well-developed logistics departments, logistics service providers, and suppliers of logistics equipment and software to develop a competency-based approach to curriculum design, taking into account the opinion of the students and the business (<https://www.unwe.bg/en>).

Challenge 12: Apply feedback loops mechanisms among the three sides of the 'Knowledge Triangle' (University, Research and Business)

Guideline:

- A. Develop and continuous update of a 'feedback loop' mechanism within the FRAMELOG, involving key actors from the logistic and supply chain management area

In order to guarantee not only the sustainability of FRAMELOG, but also its improvement over time, the key players should stay in permanent connection based on specific agreements and established working mechanisms that allow for smooth flow of data and communication.

This permanent exchange of data and experiences, based on specific conventions (that make clear statements regarding cooperation objectives, methods, performance indicators, tools, etc.) and having precise goals is the fundamental condition for ensuring the quality of the educational programmes and the sustainability of the FRAMELOG application.

Practical guidance:

- Based on the cooperation agreements, conduct permanent communication of data among the three key players in order to ensure that the educational programmes are always up to date for the industry and for the research environments (e.g. use common online platforms, regular emails and/or meetings, formative assessments, etc.)
- Organize Peer-Review activities among the key players in order to collect qualitative feedback and data, and for enhancing the cooperation
- Implement appropriate data management activities (that provide scientifically relevant data analysis, that provide accurate and integrated data from the key stakeholders, that provide data relevant and customized for HEIs, research and business, etc.) that allow for effective data analysis benefitting all main players: HEI, business and research organizations, students, the logistic and supply management area in general at all levels.

Example:

The Politecnico di Milano School of Management ' Observatory on Contract Logistics' is part of the Observatories on Digital Innovation system by Politecnico di Milano School of Management with a group of 20 companies acting as partners of the Observatory . Workshops are organized to transfer outcomes of the Observatories to Business School students (<https://www.mip.polimi.it/en/>).

3.4. Guidelines for the challenges identified in the ACT phase

Challenge 13: Periodically improve/update academic programmes (contents, delivery methods and stakeholders involved) and activities based on evaluation results and new market needs.

Guidelines:

A. Annual review of learning programmes and activities within the FRAMELOG

The education programme can be improved in all its stages: planning, delivery and assessment, and it should be based on the data and feedback collected from the key players involved (HEI staff, business and research organizations, students, policy makers, other stakeholders, etc.).

However, relevant changes should be made at least one time a year in order to avoid confusion on one hand and guarantee quality and up to date education, in line with the innovations and trends registered in the industry and research in the logistic and supply management area.

Practical guidance:

- After collecting and analysing all the qualitative and quantitative data during the different educational phases, from the relevant players organize a cooperative event (e.g. roundtable, focus

- groups, etc. - inviting business, research institutions, students' representatives) and decide upon the changes to be made to the educational programme
- Once the revisions have being done and agreed, promote them to the internal staff that will be involved in the implementation of the revised programme
 - Provide training and support to the staff for guaranteeing accurate application of the programme.

Examples:

- Undertake joint collaborative planning and forecasting with key stakeholders to improve information flow about demand for new market needs.
- Create a maturity model to enable universities and other stakeholders to create a route map for improvement to best performance and determining strategy.

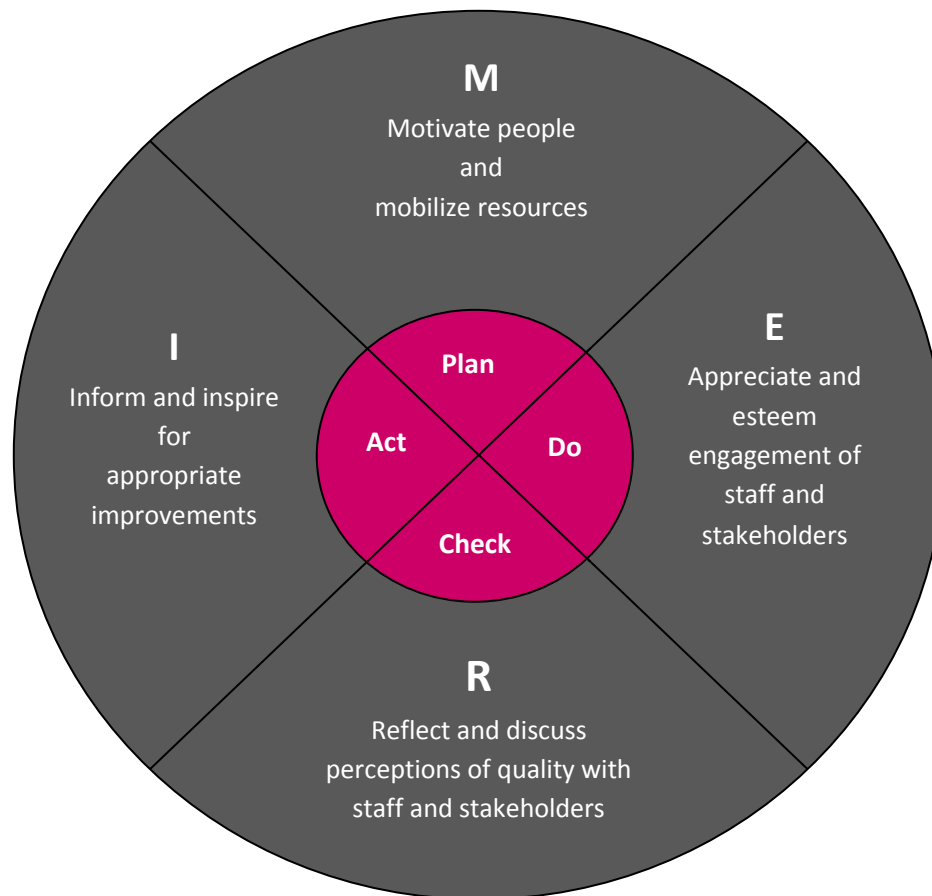
B. Ensure readiness for change within the institutions

All the previous guidelines provided demonstrated how to enhance the Quality Assurance within HEIs and the assessment strategies within FRAMELOG. Continuous improvement needs critical review, analysis and, finally, the organization of change, which is, undoubtedly, both the most crucial and critical step.

In practice, it is often seen that the last step of the PDCA-cycle, which is about organizing review and change is not consequently implemented. Therefore, special emphasis has been laid to the question how to ensure that organizational change is going to happen: one approach is to improve the abilities and competences of teachers and staff, the other one is to increase acceptance of change amongst people.

The final question is: how can a culture of change be achieved in the organization, and improvement of quality of education become self-evident? Of course, it is important to make sure that teachers, trainers and other staff of the education provider (that can be HEI, as well as business and research organizations) know about and understand the logic of the PDCA-cycle and of FRAMELOG. This way of thinking and acting should be integrated into the everyday life of HEIs and used systematically in all its areas of operation.

Beyond embedding this attitude and behaviour in the institution, the development of a quality culture is mainly influenced by human factors, which are supported and encouraged by making use of appropriate soft skills, as explained in the following figure (MERI-cycle).



Practical guidance:

- Support the development of all the necessary skills of staff for ensuring Quality Assurance within FRAMELOG in relation to the educational programmes, with a special focus on the soft skills indicated in the MERI Cycle;
- Motivate staff and mobilize resources for continuous improvement in terms of staff training, organizational profile, education programme, cooperation and communication with stakeholders from the logistic and supply chain management area, etc.;
- Appreciate and esteem the engagement of staff and stakeholders involved in the educational programme (rewards, public appreciation, engagement in other actions, etc.);
- Reflect and discuss the assessments, evaluations and opinions of staff and stakeholders;
- Promote and inspire appropriate improvement (through: accurate monitoring, constructive feedback, peer support, team working approach, etc.).

4. Conclusions

As suggested by EQAVET, the Guidelines build on the principles of the PDCA-cycle (Plan, Do, Check, Act), considering the characteristics of FRAMELOG and the prerequisites and peculiarities for QA in HEI in the logistic and supply chain management area.

It is a key priority of these Guidelines to promote and support high quality in HEIs' educational programmes. At the level of the Education institution this can be integrated through implementing the FRAMELOG for anticipating new professional trends in the labour market, adapting the content of existing programs accordingly, introducing innovation in curricula (in terms of method and contents) and promoting readiness for change.

In the process of teaching and learning itself quality can be achieved by promoting the capacities of teachers and other staff to recognize and to respond appropriately to the individual needs of the students, by strengthening individualised education, targeted support and personal advice, individual consulting and work-based learning, with the engagement of key players, such as companies and research institutions.

Quality-related activities directly linked with the teaching and learning process are oriented in particular to train and motivate teachers and in-company trainers, and providing esteem for their strong engagement. They play a vital role in the production of quality, in particular when it comes to the customisation of services and elaboration of individual learning plans for the students. Quite frequently, the dynamics for quality are pushed by the enthusiasm of teachers and their commitment to improve their performance. Quality development is inconceivable without the personal engagement of staff.

In addition, within the context of FRAMELOG, quality activities also include a various number of actions conducted in close collaboration with key stakeholders, in particular with companies and research institutions: set-up sustainable cooperation agreements, collaborate for definition, delivery and assessment of educational programmes, cooperate for further improvement of staff professional capacity and of the educational programme itself in terms of contents and methodology.

For the FRAMELOG Partnership, the European QA Framework has proven its capacity to serve as a common language that gave the opportunity to understand the peculiar approaches that need to be considered for successful implementation of FRAMELOG.