D-EWI

Digital Training for European Welding Inspectors

International standardization of practices in e-learning by digital tools

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Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein. ERASMUS+: Project nrº 2021-1-RO01-KA220-VET-000028175.

Revision	Date	Author/Organisation	Description
1st	17/12/2023	Luca Costa /IIW	First issue
2nd	22/12/2023	Luca Costa / IIW	Revision after discussion with BL-Assessors
3rd	31/12/2023	Luca Costa / IIW	Final issues with detailed explanation of EWF documents

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1. Summary report

International standardisation of practices in e learning by digital tools. Current applicable international standards consider that only a limited amount of teaching hours can be delivered through digital tools. Limitations are based on the poor international harmonization available on the e-learning digital tools and on the insufficient information on the effectiveness in transferring information to students digitally. Specifically, current guidelines do not consider the possibility of offering the full content of the training digitally, and specifically a very limited amount of practical training.

Applicable documents are reported below:

- Doc. EWF/IIW/IAB 041: Guideline for the Education, Training and Qualification of International Welding Inspectors
- Doc. IIW/IAB 195 “blended learning”
- Doc. EWF 416/IIW/IAB 001 “Rules for the implementation of IIW Guidelines for the education, examination, qualification, and certification of welding personnel”
- EWF/IIW OP15 “Evaluation of Blended Learning Courses”,
- EWF/IIW OP3 “ANB/ANBCC Assessment Process”.

Above documents were developed jointly by the European Federation for Welding, Joining and Cutting (EWF) and the International Authorisation Board (IAB) of the International Institute of Welding (IIW). These organisations are responsible for the development of international standards for the education, training, and qualification of European Welding Inspection (EWI) and International Welding Inspection (IWI) Personnel. The set of documents covers all aspects of the education and training procedures, offered with all applicable means (classroom, blended, fully digital).

During the development of the Project, all involved partners considered possible revisions of the applicable documents, to be presented to the relevant bodies for approval with the goal of supporting the innovation of the training sector by providing further evidence of the effectiveness of the approach and on the availability of harmonised teaching tools and approaches to offer digital training. A set of 5 recommendations were developed for the following documents:

- Doc. IIW/IAB 195 “blended learning” should be improved in the area of guidance and recommendations of on tools to be used for practical training and the amount of allowable online training updated consistently.
- EWF/IIW OP15 “Evaluation of Blended Learning Courses”, is improved on the criteria and guidance for the assignment of rates to blended learning tools.

This report and recommendations are presented to the appropriate bodies in EWF and IIW that are involved in the development and approval of the guidelines:

- IAB WGA#3b Working Group “International Welding inspection Personnel”.
- IAB WGA#6a Working Group “Blended Learning” of the International Authorisation Board of IIW
- IAB WGB#1 Working Group “Rules and Operating Procedures” of the International Authorisation Board of IIW.
- EWF IWQC, International Welding Qualifications Council.

By implementing the recommendations included in this report, the training sector is expected to be innovated based on evidence of the effectiveness of the distance learning approach supported by the availability of harmonised teaching tools and approaches to offer digital training ad developed in the context of the D-EWI project.

2. Introduction

The European Federation for Welding Joining and Cutting (EWF) and the International Authorisation Board (IAB) of the International Institute of Welding (IIW) are the organisations responsible for the development of the international standards for the education, training, and qualification of European Welding Inspection Personnel. This is based on the Agreement between IIW and EWF that the two organisations are jointly developing the guidelines for the European and international qualifications, and this falls under the responsibility of IIW.

A set of guidelines is available to cover all aspects of the education and training procedures, offered with all applicable means (classroom, blended, fully digital). The guidelines are adopted by Training Bodies under the Authorisation by IIW:

- Doc. EWF/IIW/IAB 041: Guideline for the Education, Training and Qualification of International Welding Inspectors
- Doc. IIW/IAB 195 “blended learning”

The set of all the above documents defines the number of teaching hours that can be delivered through digital tools. Before the development of the D-EWI project, limited experience in the e-learning digital tools and insufficient information on the effectiveness of transferring information to students digitally did not support a significant amount of training hours to be transferred digitally. In particular practical training is designed as a classroom / laboratory work, and amongst the scope of the project is to identify the appropriate approach for a distance learning delivery.

In the development of PR 5, the following rules and operational procedures were also considered, as they are used for the assessment of the correct implementation of the above-mentioned guidelines, as refers to digital training tools.

- Doc. IIW/IAB 001 “Rules for the implementation of IIW Guidelines for the education, examination, qualification, and certification of welding personnel”
- EWF/IIW OP15 “Evaluation of Blended Learning Courses”,
- EWF/IIW OP3 “ANB/ANBCC Assessment Process”.

The activities and tasks are distributed in a balanced way between partners, so that each of them will play a well-established role, without any overlapping of activities/responsibilities. The specific tasks within the standardisation of practices in digital eLearning of EWI will be shared amongst the partners as based on their mutual agreement, considering the expertise of each partner and the assigned workload and related budget.

The current EWF/IIW applicable documents were analysed, identifying areas in which the implementation of digital training tools could introduce an added value in terms of effectiveness and efficiency of the training offering while being consistent with the strictness and respect for basic requirements for the current personnel qualification procedures.

It shall be noted that sections of the above-cited documents are not public as their use is a prerogative of those organisations delivering the EWF/IIW training and qualifications. Nevertheless, for the scope of the project all the available information was shared amongst the members of the consortium and agreement was reached on the public content as deliverables of the project.

3. Guideline for the education, training, and qualification of welding inspection Personnel (doc. EWF/IIW/IAB 041)

The Guideline provides the core education and training in welding and inspection technology required by those responsible for performing inspection tasks at various levels.

3.1. Analysis of the current guideline

Section 1 covers the minimum requirements for education and training in terms of objectives, scope, learning outcomes and teaching hours to be devoted to achieving them. Students having successfully completed this course of education and training will be expected to be capable of applying welding inspection technology as covered by the Guideline.

Different qualification paths (routes 1 to 3) are considered in the guideline:

Route 1 considers that candidates should attend the education and training and pass the relevant exams. However, candidates may decide based on prior learning and/or experience and subject to an appropriate assessment and authorisation to proceed directly to the Welding Technology (WT) Exams; only in this case, passing the WT exams is required before entering the Welding Inspection Education and Training modules.

Route 2 is designed for those already holding existing IIW qualifications as Welding Coordination Personnel (International/European Welding Engineer, International/European Welding Technologist, International/European Welding Specialist) who may proceed directly to the Welding Inspection Modules at the relevant level.

Route 3 is designed to offer career development for those qualified as International/European Welding Inspector (E/IWI) at a lower level who have gained at least two years of relevant inspection experience to progress up to IWI-C only attending WT and WI training and passing relevant Welding Technology, Inspection and Practical Exams.

Training is divided into 2 modules, namely Welding Technology (WT) and Welding Inspection (WI) each divided into submodules as reported in the table below.

Module	**Sub-Module**
Welding Technology	WT-1 Welding processes and equipment
	WT-2 Materials and their behaviour during welding
	WT-3 Construction and design
	WT-4 Fabrication, applications engineering
Welding Inspection	WI-1 Quality Assurance / Quality Control in Inspection
	WI-2 Testing of Welds and Reporting
	WI-3 Practical work on testing

Table 1 – Modules in IWI training

It shall be noted that Submodule WI-3 is designed to offer students the opportunity to perform (or assist with) hands-on training on specific points such as:

- Performance of NDT and interpretation of results
- Performance of Welders and Welding Procedure Qualifications
- Application of testing in different fields and case studies

This submodule is considered somewhat critical for the performance of Distance Learning as it involves interaction and possibly laboratory activities for the students.

It is very important to underline that the guideline does not enter the merit of the training methodology, as it only specifies duration, objective, scope and learning outcomes for each topic.

Section 2 of this document covers rules for examination and qualification. As such, it does not address training methodologies and its analysis was considered out of the scope of the D-EWI project.

3.1. Recommended revisions

As previously specified, the guideline does not enter the merit of the training methodology and no note was found during the development of the project that any among duration, objective, scope and learning outcomes for each topic should be reconsidered.

As such, no specific recommendation to change the document is forwarded to the relevant bodies.

4. Guideline for Blended Learning - BL and E-Learning - EL (IIW/IAB-195).

This guideline provides the approach using Blended learning / E-Learning techniques with the aim of improving access to IAB-approved qualifications (diplomas) and provides that the essential that the quality of courses delivered in this way must be equivalent to that of the classroom learning and this guideline.

4.1. Analysis of the current guideline

For the scope of the guideline, the following definitions are used throughout the text:

- Blended learning: Term describing learning, that mixes various event-based activities, including face-to-face classroom presentations, and self-paced studies.
- Distance Learning: it is the education (including e.g., e-learning, video, and Interactive multimedia) of students who are not physically present at a school or training Centre.
- e-Learning: the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.

Part 1 of the guideline covers basic requirements concerning the application of blended learning or e-learning by IIW Authorised Training Bodies (ATBs) which are of relevance for any kind of procedure.

This part covers the following aspects:

- Maximum Duration of DL/EL: A specific section of the guideline (part II) covers the maximum duration of the blended learning part of each qualification and training guideline.
- Organisation and course management: to use blended delivery techniques effectively, the IIW Authorised Training Body will need specific resources and procedures to operate these courses in an acceptable and effective way.
- Teaching methods: different teaching methods are considered for classroom and blended or e-learning training. The guideline clearly specifies that workshop training, demonstration, and laboratory work cannot be delivered by blended / eLearning techniques.
- Monitoring Student Progress: the guideline requires that periodic assessments be carried out for each module in order to evaluate the progress of students and to assess the effectiveness of the training process.
- Monitoring Attendance and participation: The BL program shall monitor that all the items were attended by participants, by student progress monitoring.

- Standards: Students shall have access to the applicable standards, as required by the relevant guidelines.
- Evaluation of IIW BL/EL: the requirements for the review, approval and implementation of BL/EL are covered by EWF/IIW OP-15. -

Part 2 of the guideline provides information about the minimum amount of teaching hours to be provided in classroom. Requirements on the delivery in Blended/distance Learnoing of International Welding Inspector education and training are reported below. The requirements were developed by the IAB Working Group dealing with the guidelines for the education, training, and qualification of welding inspection Personnel (doc. EWF/IIW/IAB 041), namely IAB WG A#3b "International Welding Inspection Personnel". This particular area required in depth investigation during the development of the project.

It is required that at least 20% of the total teaching hours should be carried out in classroom training for the Welding Technology modules (WT), all levels. This amount applies to the total duration, and not to each single topic. However, an exception is for the area of practical demonstrations covering different welding and cutting processes, such as MMA, TIG, MIG/MAG/Flux Cored arc welding, Oxy-cutting, Air-Arc, Plasma-cutting, Arc-Cutting; this section is required to be delivered in laboratory.

In the area of welding inspection modules, the requirements are more restrictive. This is justified by the fact that limited experience in the effectiveness of e-learning digital tools was available at the time when the requirements were set. Like the WT modules, it is required that at least 20% of the total teaching hours should be carried out in classroom training for the Welding Inspection modules (WI), at all levels. this amount applies to the total duration, and not to each single topic. However, several exceptions are set for the following training areas to be delivered in classroom or laboratory, as refers to:

- Paper exercise on checking, reviewing and evaluating welders approvals, Welding procedure specifications and Welding Procedures Qualification Records
- Critical review of selection of NDT methods
- Documents for quality control in welding, focussing on management, review, evaluation, validation, quality control principles and the key documents used, and recognising the importance of accurate records with respect to the inspection process.
- The entire submodule on practical work on testing (module 3).

It appeared evident that this particular area required specific focus, so the total number of teaching hours covered by the exceptions is 25 for the Basic Level, 27 for the Standard level and 19 for the Comprehensive level. It is important to realise that training at a lower level is compulsory to get a higher level. Therefore the above amounts should be considered as follows:

- For a candidate willing to qualify for the Basic Level, the total amount of teaching hours in classroom or laboratory is 25
- For a candidate willing to qualify for the Standard Level, the total amount of teaching hours in classroom or laboratory is 52
- For a candidate willing to qualify for the Comprehensive Level, the total amount of teaching hours in classroom or laboratory is 71

As a final note, it is reminded that a teaching hour is composed of 50 minutes.

As a result of the analysis, the two following areas shall be considered as referring to the use of digital training tools for improvement based on the result of the project:

- When used in the classroom (both in the presence and in online participation), digital training tools are considered teaching aids and no specific requirement applies.
- When used as a tool for e-learning the requirements provided in above apply. They include that workshop training, demonstration, and laboratory work cannot be delivered by blended / eLearning techniques. As such Sub module WI-3 “Practical work on testing” cannot be delivered by using digital tools outside of the classroom.

4.2. Recommended revisions

Based on the performed analysis, it was considered that the guideline could be revised to help users identify more precise requirements for the offer of Blended learning or e-learning courses. Specifically, requirements could be identified on the type of learning tools and student monitoring processes. The information could be based on the requirements provided within EWF/IIW OP15, Appendix 3 (see item 6.1). As an example, minimum requirements consider that the DL/BL shall include, as a minimum:

- Criteria for identification of equivalency between Classroom and Distance / e-learning
- Required tools to be offered to students.
- Number of questions per teaching hours for self-assessment.
- Possible criteria to evaluate and control the progression of the students.
- Possible requirements to attend the training following a precise training structure.

Based on the results achieved on the other Intellectual Outputs evidence is shown that distance training may be efficiently delivered for workshop training, demonstration, and laboratory work. This should be considered in a possible revision of the guideline as follows:

- Rewording of item “5.2 Laboratory and practical work”: Workshop training, demonstration, and laboratory work cannot be delivered by blended / eLearning techniques to allow use of digital learning tools.
- The requirements for the minimum amount of classroom training of E/IWI are revised by removing the exclusion of sub-module 3 (submodule on practical work on testing, see item 4.1). As a consequence, of this recommendation, the requirement of a minimum 20% of classroom/laboratory delivery applies to practical training in Inspection.

In the IAB System, assessment of the Blended Learning training material is performed by specialised assessors, referred to as Blended Learning Assessors (BL Assessors). It is recommended that BL Assessors are involved in the revision of the guideline.

5. EWF 416/IIW/IAB 001 “Rules for the implementation of IIW Guidelines for the education, examination, qualification, and certification of welding personnel”

The document covers the rules by which the EWF and IIW Guidelines for the Education, Training, Examination, Qualification, and/or Certification of Welding Personnel are implemented, such that the requirements are applied uniformly by all countries involved, and that the diplomas granted are mutually recognised in every IAB member country, with no geographic restriction.

In general the document covers applicable rules for the bodies involved in the delivery of every EWF and IIW education, training and qualifications:

- Authorised Nominated Bodies (ANBs) are the organisations representing EWF and IIW in given geographical areas, being responsible for the examination, issuing of diplomas and

authorisation of training centres. In general, they have a high degree of responsibility in the quality management of the system and are subject to assessment by EWF and IIW.

- The Authorized Nominated Bodies (ATBs) are the organisation responsible for the delivery of training. As such, the are requested to comply with the guidelines and are assessed by the ANBs.

5.1. Analysis of the current guideline

The document is made of 5 parts.

The first part deals with the requirements for IIW Authorised Nominated Bodies (ANBs), including roles and responsibilities, structure, personnel, and quality management system. Personnel, procedures, and operating structure should be consistent with the Guidelines implemented by the ANB. No specific requirement refers to Blended Learning and e-learning or E/IWI qualifications as these are separate documents with which the ANB shall comply.

The second part covers ANB assessment, surveillance, and reporting procedures. The objective of assessments, surveillance, follow-up, and re-assessments is to ensure that the ANB has in place the features, procedures, documentation and staff which allow it to function in accordance with these Rules, the Operating Procedures and the IIW Guidelines in use by the ANB. No specific requirement refers to Blended Learning and e-learning or E/IWI qualifications as these are separate documents with which the ANB shall comply.

The third part deals with the procedures for the approval of Training Bodies (ATBs) by ANBs. Approval covers a specific scope of activities to conduct courses designed to prepare candidates for qualifications, as described in the IIW Guidelines for the education of welding personnel. ATBs are approved for a specific scope of activities with respect to the qualification level, the team of lecturers, course materials, facilities and equipment, language, location, etc. ANBs are responsible for ensuring that ATBs conduct IIW courses within the approved scope of activities. Specific requirements are not included in this document, but in the relevant guideline; as such, no specific requirement refers to Blended Learning and e-learning or E/IWI qualifications as these are separate documents with which the ATB shall comply.

In the fourth part, the qualification or certification process requirements are covered based on those defined in the IIW Guidelines. ANBs shall operate in accordance with those requirements and in accordance with the further requirements presented in the document. However, qualification procedures are independent of the training method. As such, this section has no relevance in the framework of the D-EWI project.

The fifth part deals with the routes for qualifications. The IIW Guidelines training programs, defines the education and training syllabuses, which are intended to be taught in a classroom environment, thereby providing for direct interaction with the students on a continuous basis. They require a significant input of application experience so that the knowledge and thought processes of experienced engineers may be transferred to the students. Practical work, demonstrations and DVDs are also significant mandatory aspects of the IIW programmes. Document IAB 001 consider that some content of the syllabuses may be replicated in Blended Learning or other learning methods, but some of the attributes mentioned above cannot. It is only through exposure to individual experts that these benefits may be gained. The part provides a summarised explanation of the qualification paths available to gain IIW qualifications:

1. The Standard Route
2. The Alternative Route
3. Blended Learning Route

4. The Experiential Route
5. The Automatic Route
6. The Transition Route

Given the summarised content of this section, it is not considered of particular interest for the scope of the project, as the reference content is included in the relevant guidelines and operating procedures.

5.2. Recommended revisions

As previously specified, the document does not offer details of the training methodology, as it refers to the specific guidelines or operating procedures.

6. EWF/IIW OP15 "Evaluation of Blended Learning Courses"

This procedure identifies the IAB requirements for the review, approval, and implementation of Blended Learning Courses, BLC. It is cited as a reference in IAB 001.

6.1. Analysis of the current operating procedure

The main steps in the procedure are defined as follows. (see also figure 1)

It is up to the Training Body (ATB) to develop the training materials and the training programme for a "Blended Learning Course" (BLC) in accordance with IIW/IAB-195. Once this is developed, the ATB should apply to an ANB for approval presenting a Report for Distance Learning Course (RDLC). This activity is performed in close contact with the responsible person of the ANB (namely ANB Chief Executive).

The ANB assesses the BLC and approves or rejects it in accordance with the guidelines developed by IAB and this OP. In the specific case of International/European Welding Inspection Personnel, the applicable guideline is EWF/IIW/IAB 041 (see item 3).

After the positive assessment of the training Course by the ANB, the ANB applies for the Authorisation to approve the training course to the IAB (this is defined in IAB procedures as an application for the Extension to Scope).

After a positive assessment of a documental review of the application performed by the IAB, the assessment procedure is initiated by a Blended Learning Assessor (BL Assessor) of IAB. This assessment shall comprise an evaluation, according to the requirements of this OP, of how the ANB has assessed and approved the BLC. It is important to note that, if the ATB wants to use a BL system that was already approved as used by another ATB, the BL Assessor only needs to check the correct implementation and not the whole system again. For example, once the first ATB gets authorised to run a training course using the D-EWI training material, it will be much faster for the other ATBs to get the authorisation.

In parallel with this process, the ATB may start running the first course (pilot course) and the ANB the examinations of candidates. Upon completion of the course and subsequent positive assessment by the BL Assessor, the authorisation is granted and participants who successfully pass the exam can be awarded the diploma.

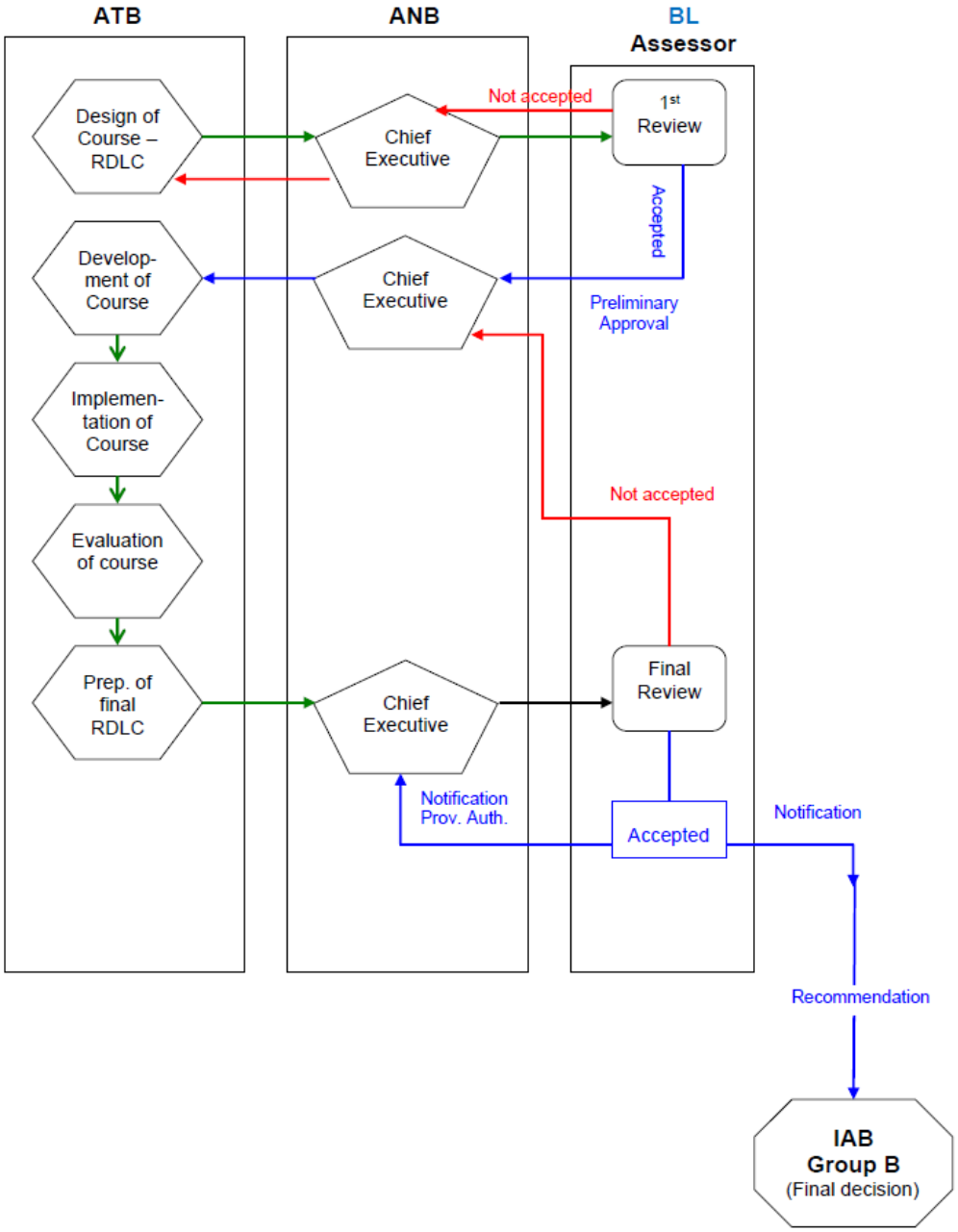

Figure 1 -Process for the evaluation of a Blended Learning Courses

A set of appendixes in the document include useful material to support the procedure:

- Appendix 1 is the SUMMARY REPORT for ANB Distance Learning Audit
- Appendix 2 is the CHECK LIST FOR RDLC ASSESSMENT to be used by the ANB and the BL assessor.
- Appendix 3 is the guideline for the implementation of training materials for distance learning and tools for assessors to evaluate distance learning materials.
- Appendix 4 is a template for the Report for Distance Learning Course (RDLC) (referred to as Report for Blended Learning Course in the document).

Within the project, we concentrated on Appendix 3. The appendix lists items that properly qualify the Blended Learning course process and materials and identifies a scoring system and minimum targets to be reached. The control points are set as follows.

Group 1 deals with the quality of training materials, as refers to:

1.1 Texts and reference materials (printed, pdf, etc.)
1.2 Texts, schemes, pictures delivered for on-line format such as e-learning platforms, specific software, etc
1.3 Auto evaluation questions.
1.4 Videos and animations (including audios)
1.5 Examples and applications
1.6 Tools for training such as advertences, common mistakes
1.7 Virtual classrooms

Specific requirements are set for the group 1, such as:

- Points 1.1 and 1.2. It is supposed that the student shall have a copy of the training materials, either in a printed document or electronic format such as pdf. Alternatively, the ATB can develop complementary materials, for example in an e-learning platform, CD or similar, covering the same function as the printed text or complementing them.
  During the evaluation of this requirement in the framework of the D-EWI project, it was noted that the requirement is satisfied.
- Points 1.3. Auto evaluation questions shall be at the level required in the international examinations for the qualification, but not the same. As this aspect is considered important form a DL/BL perspective, each item shall have a minimum of 10 questions. Automatic feedback to the student regarding wrong answers is highly recommended to help self-evaluation.
  During the evaluation of this requirement in the framework of the D-EWI project, it was noted that the requirement is satisfied.
  Points 1.4, 1.5 and 1.6. Minimum one video or animation per subject is required. During the evaluation of this requirement in the framework of the D-EWI project, it was noted that the requirement is satisfied.

Group 2 deals with the technology used to efficiently deliver the training, but not the content:

2.1 Tutoring and interaction of teachers with the students by use of communication tools
2.2 Communication system among the students.
2.3 System to control the attendance of the course.

Specific criteria are set for the evaluation of points 2.1 and 2.2 based on the frequency of interactions and the answering time for questions set by students.

In general, the document assigns a range of scoring for each item of each group, with defined minimum amounts to be reached.

6.1. Recommended revisions

The Operating Procedure 15 is considered an essential document for the process of the Evaluation, authorization and delivery of training courses using Digital Training Tools in the framework of IIW Blended Learning courses.

The first recommendation is purely editorial and refers to the harmonization of the terminology throughout the document. In particular, the terms “Report for Distance Learning Course (RDLC) and Report for Blended Learning Course (RBLC) are used in the document but dealing with the same subject. Is recommended that revisions are considered accordingly.

The second recommendation is that the principles to be used by the assessor to assign rates to the control points are better detailed to ensure appropriate homogeneity of evaluation. Criteria shall be defined in accordance with the recommendations that should be given in document IAB-195 (see recommendations on item 4.2). As earlier discussed, those recommendation should be based on the successful results achieved by the D-EWI project.

In addition (third recommendation) the guidance provided in the text should be expanded and better defined, including moving the requirements to IIW/IAB-195.

7. EWF/IIW OP3 "ANB/ANBCC Assessment Process".

The objective of this procedure it is to define how the assessment process is developed for an ANB aiming to reach the authorisation and to maintain it according to the IIW-IAB rules, guidelines, and operating procedures.

7.1. Analysis of the current operating procedure

The procedure covers different aspects of the Authorisation procedure for ANBs, as follows:

- Responsibilities
- Assessment Process (The audit team, Guidance to Assessors, Applicant ANB Status, Assessment Process, Formal Approval Process, full authorisation)
- Maintenance of ANB/ANBCC Authorisation (Assessment Cycle, Waiving, Suspension,
- ANBs/ANBCCs Extension to Scope
- Cost of Assessment of Applicant or existing ANBs/ANBCCs

In particular, the extension to scope applies to ANBs getting the authorisation for Blended Learning Courses that may use Digital tools as part of the Training Methodology. However, the procedure does not deal with the specific item as this is referred into EWF/IIW OP 15 (see item 6). Figure 2 provides an outline of the approval process; day one corresponds with the application sent to IIW.

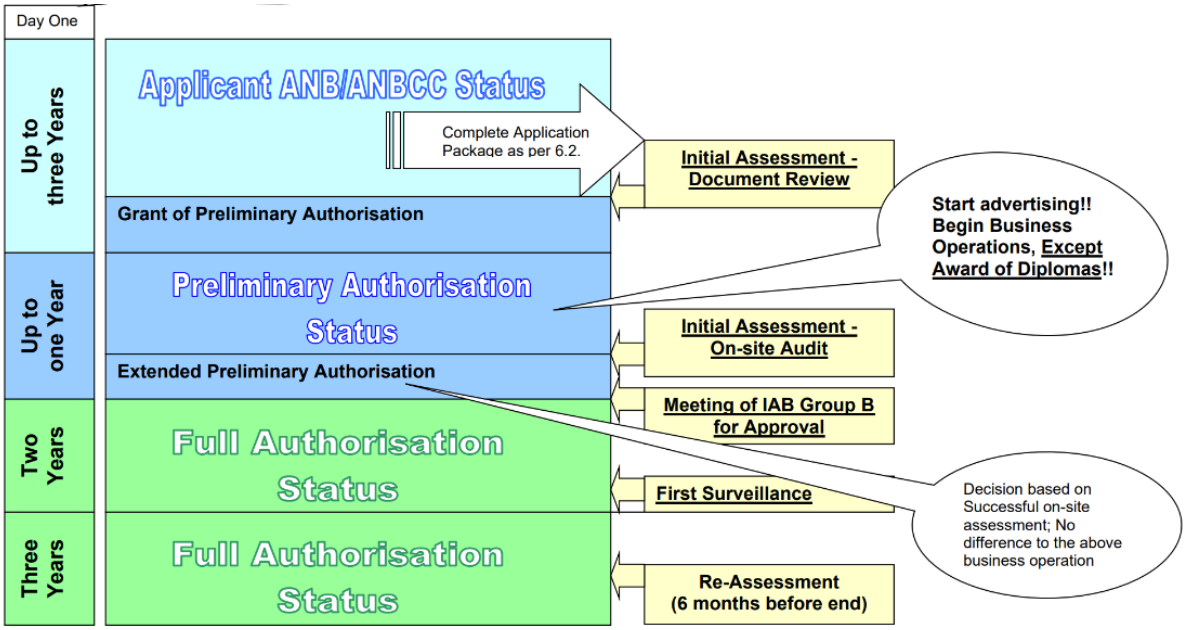

Figure 2 - Outline of the approval process

7.1. Recommended revisions

As previously specified, the operating procedure does not enter the merit of the training methodology and no note was found during the development of the project. As such, no specific recommendation to change the document is forwarded to the relevant bodies.

8. Transfer of the improvements to the relevant bodies.

8.1. Procedures

As part of the scope for this Project Result, the consortium has the to properly present and manage the transfer of the intellectual outputs 5 to the relevant European and International Bodies. Analysis was carried out on the appropriate bodies to contact to share the result and seek for approval of the proposed recommendations.

It was found the responsibility for all the concerned documents and recommendations stays within the following Working Groups of the International Authorisation Board of the International Institute of Welding (IIW IAB):

- IAB WG A#3b “International Welding Inspection Personnel”
- IAB WG A#6a Working Group “Blended Learning”
- IAB WG B#1 Working Group “Rules and Operating Procedures”

The working groups have the responsibility to discuss the proposed changes and possibly derive recommendations to the main committees of IAB for approval:

- IAB WG A#3b and WG A#6a report to IAB group A “Education, Training and Qualification”.
- IAB WG B#1 reports to IAB Group B “Implementation, Authorisation and Certification”.

The possible approved changes need further endorsement by the IAB Board that has operational oversight and leadership of the IAB activities in IIW and by the International Welding Qualifications Council of EWF.

Based on the agreement between IIW and EWF, the possible changes will be automatically adopted by the relevant EWF documents.

It is the responsibility of IIW as leader of this Intellectual Output to contact and report these recommendations to the chairs of the working group to start a discussion on the subjects. The chair of the relevant Groups received this document by e-mail on 22 November 2023 and was requested to initiate a discussion on the recommendations.

8.1. Summary of the recommendations

A summary of the recommendations with the reference bodies is reported below. It includes the specific point where the requirements are set in the applicable documents.

Document	Recommendation			Reference unit
	#	Ref.[1]	Summary	
Doc. EWFIIW/IAB 041	-	3.2	No proposed changes	IIW/IAB WG A#3b EWF IWQC
Doc. EWFIIW/IAB 195	1	4.2	Detail guidance on the type of learning tools and student monitoring process, also based on the information provided in IAB OP 15, Appendix 3	IAB WG A#6a EWF IWQC

Document	Recommendation			Reference unit
	#	Ref.[1]	Summary	
	2	4.2	Consider rewording of item "5.2 Laboratory and practical work" to allow use of digital learning tools	IAB WG A#6a EWF IWQC
	3	4.2	Table 2, Part, is revised to allow use of digital learning tools for Submodule WI 3.3	IAB WG A#3b EWF IWQC
	4	All	BL Assessors are involved in the revision of the guideline	
Doc. IIW/IAB 001	-	5.2	No proposed changes	WG IAB B#1 EWF IWQC
OP15	5	6.2	Harmonization of the terminology between RDLC and RBLC	WG IAB B#1 EWF IWQC
	6	6.2	Transfer requirements to the guideline IAB -195 (Appendix 3)	WG IAB B#1 EWF IWQC
	7	6.2	Revise the text moving requirements to IAB-195 and improving information on the assessment criteria.	WG IAB B#1 EWF IWQC
OP3	-	7.2	No proposed changes	WG IAB B#1 EWF IWQC
[1] Item in this report with further details				

Table 1 - Summary of the recommendations developed in IO 5.

9. Conclusions and follow up.

Ased on the evaluation and on the results achieved by the project in the development of e-learning materials for the education and training of International Welding Inspectors, the following conclusion can be considered:

1. The e-learning material delivered if fully consistent with applicable requirements set by the applicable documents and guidelines.
2. There are significant areas of improvement of the quality control documents in EWF and IIW, as it is demonstrated that modern tools offer opportunities to further extend the applicability of distance/blended learning to areas such as welding demonstration, NDT application, laboratory work and classroom exercises.

The report was discussed with applicable bodies (see item 8) and positive feedback was received that the suggested recommendation will be kept in consideration for the review of the EWF IIW System for the blended/distance learning activities for the organisation. It is agreed that by implementing the recommendations included in this report, the training sector is expected to be innovated based on evidence of the effectiveness of the distance learning approach supported by the availability of harmonised teaching tools and approaches to offer digital training ad developed in the context of the D-EWI project. The review process will be initiated in 2024.