

SAM

SECTOR SKILLS STRATEGY
IN ADDITIVE MANUFACTURING

2.7 Kit to collect feedback on qualifications and training modules (M42)

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1. Introduction

This document consists of a guideline which was part of D2.7 - Kit to collect feedback on qualifications and units of learning outcomes (ULO) / competence units (CU) of SAM project (<https://www.skills4am.eu/>). It was produced in the framework of WP2 – “Forecast methodology: assessment of current and future skills in AM”, which aimed at developing the methodology for determining the skills mismatches in the AM sector, and it is meant to support the respective questionnaires’ implementation, explaining:

- to whom the questionnaires are targeted at
- inputs and outputs of the questionnaires
- steps to be implemented
- resources to be used (online; e-mail; using a software)
- timeframe to use the questionnaires
- expected number of stakeholders and targets to be involved.

Adding to this, the document also includes templates for the questionnaires to be answered by the targets. This is already a final version of the kit, taking advantage of three pilot courses stages in SAM project and considering the kit’s sustainability as an AM Observatory tool.

In summary:

D2.7 - Kit to collect feedback on qualifications and training modules	
AIM	Identify improvement needs in the IAMQS training offer, contents, allocated time and methodologies, in line with the evaluation and review parts of the European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET) quality cycle
TOOLS USED	Feedback surveys
TO WHOM	Trainees/students and trainers/teachers
INDICATORS/LEVEL OF IMPACT	Number of answers to the feedback surveys Percentage of replies obtained from participants who completed the course Improvement needs identified in Qualifications / Units of Learning Outcomes (ULOs) / Training modules /Competence Units (CUs)
INPUT	Qualifications ULOs/Training modules/CUs
OUTPUT	Data on the need to update, review and/or develop Qualifications or CUs Data on the relevance, attractiveness and usability of Qualifications or CUs Suitability of learning and assessment context and tools
TIMEFRAME	The surveys are to be implemented in the last day of training, after the assessment takes place

Table 1 – Summary of D2.7 features

2. Target group

There are two targets for this kit:

- a) Trainees/students that undergo a training course in which a Qualification or a specific Unit of Learning Outcomes/Training Module/Competence Unit is delivered.
- b) Trainers/teachers that run the course.

These targets are expected to be coming from companies, Research and Technology Organisations (RTO) and Vocational Education and Training (VET) organisations or even higher education institutions.

This kit can be used not only in piloting activities but also in the implementation of courses by partners in their AM related teaching activities. The ambition is that the kit can be used by AM training centres of the IAMQS – International AM Qualifications System to evaluate the quality of their programs according to the European Quality Assurance Reference Framework for VET (EQAVET).

3. Methodology

This kit is a tool of the Quality Assurance system designed for the IAMQS, being aligned with the EQAVET. The stages foreseen in the EQAVET quality cycle are the following:

Stage 1: Planning. Set up clear, appropriate and measurable goals and objectives in terms of policies, procedures, tasks and human resources.

- Explicit goals/objectives and targets are set and monitored, and programmes are designed to meet them
- Ongoing consultation with social partners and all other relevant stakeholders takes place to identify specific local/ individual needs
- Providers plan cooperative initiatives with other VET providers and all other relevant stakeholders

Stage 2: Implementation. Establish procedures to ensure the achievement of goals and objectives.

- designing an effective communications strategy early in the process
- how best to take views of all the stakeholders, including staff (e.g. trainers)

Stage 3: Evaluation. Design mechanisms for the evaluation of achievements and outcomes by collecting and processing data to make informed assessments.

- evaluation needs to be considered at an early stage – ideally during the planning stage
- how to collect data in a systematic and predictable way to provide clear outcomes for all stakeholders
- how to use the indicative descriptors to gauge the effectiveness of your current practice and identify what more can be achieved

Stage 4: Review. Develop procedures in order to achieve the targeted outcomes and / or new objectives.

- how to introduce changes following a review. This is best considered during the early planning stage of designing a quality assurance approach
- how the use of the indicative descriptors will help you gauge the effectiveness of your current practice and identify what more can be achieved
- the value of publishing information on performance as this is likely to lead to increased public confidence in the quality of your VET provision and make VET provision more attractive

This kit tackles part of stage 3 requirements, as it is to be used as a tool to collect data in a systematic and predictable way to provide clear outcomes for all stakeholders, and it allows gauging the adequateness of qualifications / Units of Learning Outcomes and the need to review them.

Considering the [EQAVET Indicators](#):

- Indicator 1. Relevance of quality assurance systems for VET providers
- Indicator 2. Investment in training of teachers and trainers
- Indicator 3. Participation rate in VET programmes
- Indicator 4. Completion rate in VET programmes
- Indicator 5. Placement rate in VET programmes
- Indicator 6. Utilisation of acquired skills at the workplace
- Indicator 7. Unemployment rate
- Indicator 8. Prevalence of vulnerable groups
- Indicator 9. Mechanisms to identify training needs in the labour market
- Indicator 10. Schemes used to promote better access to VET

This kit has the potential to contribute to assess the level of performance in terms of **indicator 4**, if its application is mandatory for all courses completers, as it will allow to measure the percentage of those completing a CVET programme (i.e., attaining a formal qualification or ULO which leads to recognition), compared to those entering the programme. In this case, the number of those answering the questionnaire compared with those entering the course (whether it is a complete qualification or a ULO) will constitute data that will allow measuring the indicator, in line with the quality cycle.

Another EQAVET indicator that this kit has the potential to contribute to is **indicator 9**, as it is about mechanisms to identify training needs in the labour market, being part of the mechanisms used to update the VET offer according to those needs, and feeding stakeholders with the most recent information on the training needs that need to be met to provide the future needs of the labour market – which falls in the scope of the SAM forecast methodology.

During the SAM project, the compulsory procedure was to implement, in each pilot course, two surveys:

- the **survey for trainees/students** - All pilot courses' participants need to fill in a feedback form for each CU that was tested. This feedback form consists of a questionnaire containing a number of questions allowing a measurement of the CU/qualification adequateness, including the evaluation of contents and teaching strategies or tools. The number of questions to be included in the questionnaire is not strict and it will depend on what the pilot course provider feels comfortable

to assess and the project development requires, in terms of information, but the structure of the questionnaire will be strict, as it is crucial to gain feedback on each part of the questionnaire. The assessment of suitability of a Qualification is done by analysing the results of the evaluation of all the CUs of that qualification. An additional tool to ascertain that suitability is also the feedback gathered from trainees after six months of completing the course (please see D2.6 “Kit for tracking students, future employees and job seekers in AM” of SAM project).

- the **survey for trainers/trainers** – All trainers involved in the delivery of the course must fill in a feedback form about their impressions on the course, whether it was an entire qualification or just a ULO/CU.

Summing up:

- a) The questionnaires will have a strict structure, and feedback on each part of the questionnaire is mandatory, to gauge the adequateness of the Qualification/CU to the labour market needs and the suitability of learning contents and context.
- b) The questionnaires will be composed of questions that will gather the necessary amount of information on the training improvement needs to be potentially addressed in a review stage.

Figure 1 summarises the methodology:

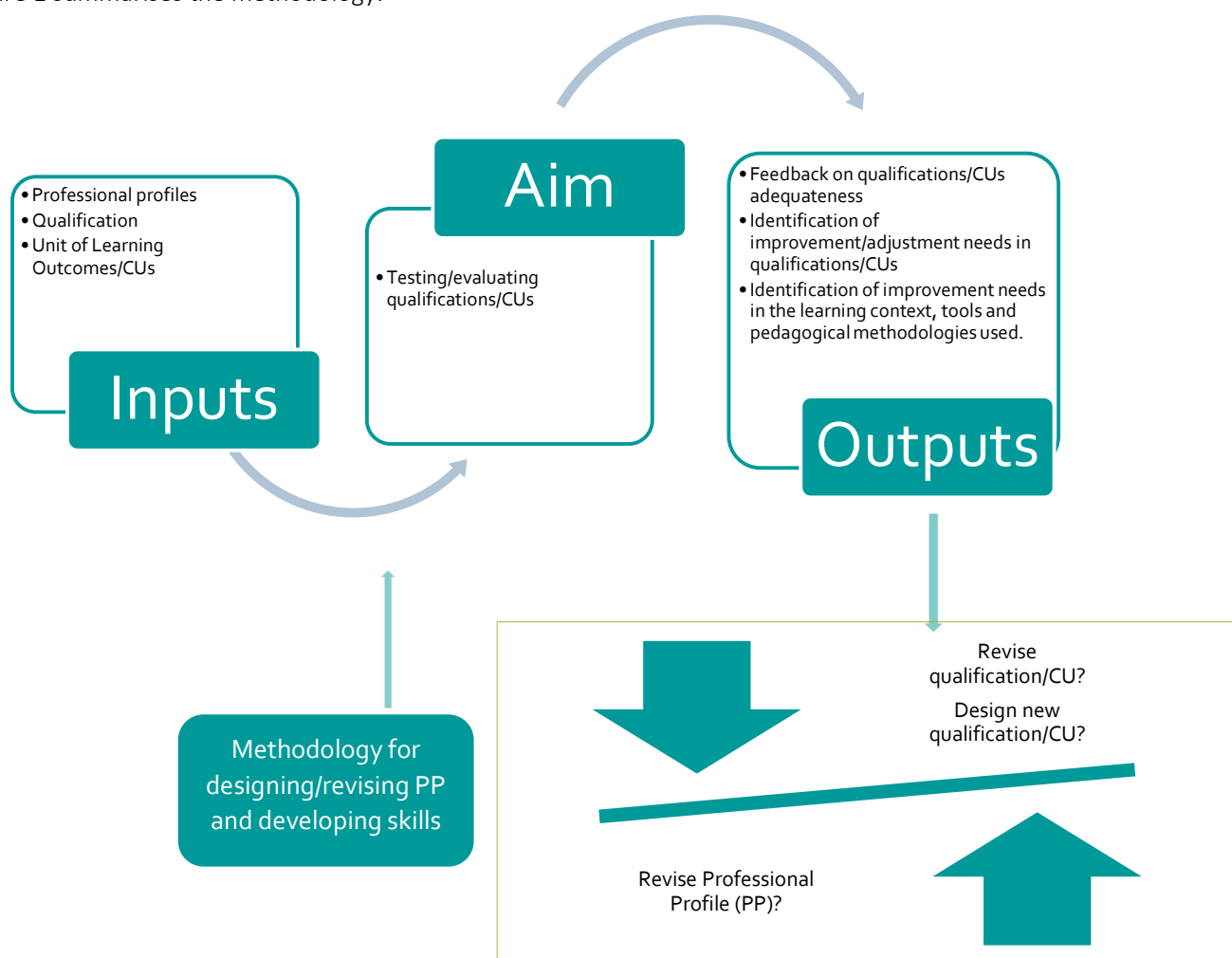


Figure 1 - Methodology applied to test qualifications and Units of Learning Outcomes/Competence Units

4. The questionnaire for trainees/students

The first tool that is used to gain information on the adequateness of the qualifications and Units of Learning Outcomes and, eventually, identify improvement needs in terms of redesign of qualifications and/or ULOs or even in learning tools and contexts used, consists of a questionnaire addressing the courses' participants.

4.1 Structure of the questionnaire

The structure of the questionnaire is composed by five parts:

1. **General information**
2. **Information on the level of satisfaction with the training conditions**
3. **Information on the level of satisfaction with the course**
4. **Information on the level of satisfaction with the training sessions**
5. **Global evaluation of the course effectiveness**

The information that should be collected using the questionnaire is detailed below.

1. **General information**
 - Gender
 - Age
 - Country
 - Type of participant (HE student, worker, VET trainee)
 - Sector
 - Education level background
 - Professional background/previous additive manufacturing experience
 - Regime in which the course was implemented (face-to-face, b-learning, e-learning)
2. **Information on the level of satisfaction with the training conditions**
 - Infrastructure conditions provided by the training provider
 - Support provided by the staff (other than trainers)
 - Communication channels used during the training
 - Suitability of the equipment used in the practical training
3. **Information on the level of satisfaction with the course**
 - Structure of the course
 - Contents addressed
 - Coherence with the training programme (was the order of contents presentation foreseen in the Competence Unit/Qualification respected by the training provider?)
 - Number of contact hours
 - Balance between theoretical and practical training
 - Transparency/communication of the learning outcomes associated to the course
 - Match between learning outcomes and what the course covered

- Relevance to own job activities (if applicable – case of trainees coming from companies)

4. Information on the level of satisfaction with the training sessions

- Quality of the learning materials (i.e., slide shows, handbooks, videos, samples)
- Dynamics of the training sessions (i.e., too expositive vs engaging/with interactive moments)
- Use of digital tools and active learning methodologies (e.g., problem-based learning, project-based learning, gamification, augmented reality, virtual reality, collaborative learning, etc.)
- Cohesion of the group of trainees (i.e., good balance of knowledge among the trainees/no big discrepancies in the background knowledge)
- General performance of the trainer(s)
- Preparedness of the trainer(s) – showed a good understanding of the subject
- Support provided by the trainer(s) (e.g., properly addressed questions and answers, good time management, ability to communicate clearly)

5. Global evaluation of the course effectiveness

- Level of satisfaction with the knowledge acquired in the training
- Level of satisfaction with the skills acquired in the training
- Level of satisfaction with the evaluation methods used
- Did the course meet the expectations of the trainee?
- Would the trainee recommend the course to others?

A specific group of questions for each of the above parts will be included in the questionnaire. The questionnaire should also include open questions for course participants to give their impressions regarding what went well and what could have been better.

4.2 Reference questionnaire

The questionnaire template to be used is provided next.

Questionnaire Introductory text:

The International AM Qualification System (IAMQS – <https://www.ewf.be/sam>) is composed by a set of qualifications for different proficiency levels in the field of AM technologies, grounded in industry requirements, covering qualifications in metal AM processing for Operators, Designers, Supervisors, Inspectors, Coordinators and Engineers and one qualification in polymers for Designers. The system is implemented through international qualification guidelines (aligned with industrial requirements) and settles on robust quality assurance procedures to ensure a harmonised delivery of training in several countries and regions across the globe. Its modus operandi is designed in a modular and flexible way, which enables its continuous update of according to the industrial requirements.

We would like to get your impressions on the training course you have now participated in, to make sure any improvement opportunity is identified and proceed with adjustments to qualifications (or parts of it) deemed necessary. You will also be contributing to the identification of needs in terms of developing new qualifications, competence units or training modules that help tackle market needs.

The questionnaire will take you about 10 min. and it is divided in five different sections:

1. General information
2. Information on the level of satisfaction with the training conditions
3. Information on the level of satisfaction with the course
4. Information on the level of satisfaction with the training sessions
5. Global evaluation of the course effectiveness

Your contribution is very important, and we would like to thank you in advance for helping us empower Europe's AM workforce!

This questionnaire is voluntary but necessary for the work we are developing. By replying to it, you are consenting that the European AM Observatory process and manage the data collected. For any additional clarification, please contact ewf@ewf.be

Questionnaire:

Section 1: General information

Question 0. Please enter your name.

This will only serve to track who already replied to this questionnaire and is granted the certificate, and who is still missing this important step. Your name will not be mentioned or reported elsewhere.

Question 1. Please select the gender you identify better with (for gender balance reporting duties, only)

Options (*only 1 can be chosen*):

- Male
- Female

Question 2. Please select the age range you are in

Options (*only 1 can be chosen*):

- ≤ 25
- 26 – 35
- 36 – 55
- ≥ 56

Question 3. In which country are you taking this training course? (dropdown question)

Austria
Belgium
Bulgaria
Croatia
Republic of Cyprus
Czech Republic,
Denmark
Estonia
Finland
France
Germany
Greece,
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden
UK
Other (please specify which)

Question 4. What would you say is your profile when engaging in this course?

Options (*only 1 can be chosen*):

- Worker
- Higher Education Student
- VET trainee
- Unemployed

Question 5. If you marked “Worker” in the previous question, what is the main activity/sector of your organisation?

Options (*more than one answer is possible*):

- Aerospace
- Automotive
- Defence
- Consumer goods
- Construction
- Energy
- Health
- Industrial equipment and tooling
- Other (please specify) _____

Question 6. What is your level of education?

- School certificate
- Bachelor’s degree
- Middle degree vocational training
- High degree vocational training
- Engineer or Master’s degree
- Doctoral degree

Question 7. What is your professional background/previous additive manufacturing experience?

Question 8. What was the regime in your course?

- Face-to-face session(s)
- B-learning (Face-to-face and online sessions)
- E-learning (online learning)

Section 2: Information on the level of satisfaction with the training conditions

Question 9. Satisfaction with the training conditions

How would you rate your level of satisfaction with...	1. Poorly satisfied	2. Not satisfied enough	3. Satisfied enough	4. Very satisfied	n.a.
a) The infrastructure conditions provided by the training provider (furnishing, heating, lighting, sanitation, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The support provided by the staff (other than trainers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The communication channels used during the training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The equipment used in the practical training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 3: Information on the level of satisfaction with the course

Question 10. Satisfaction with the course

How would you rate your level of satisfaction with...	1. Poorly satisfied	2. Not satisfied enough	3. Satisfied enough	4. Very satisfied	n.a.
a) The structure of the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The contents addressed during the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The coherence of the course with the training programme (was the order of contents presentation [foreseen in the ULO/CU] respected by the training provider?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The contact hours allocated to the course, considering the amount and nature of the course contents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) The balance between theoretical and practical training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) The relevance of the course to your job activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) The transparency/communication of the learning outcomes associated to the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

h) The match between learning outcomes foreseen for the course and what the course covered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Section 4: Information on the level of satisfaction with the training sessions

Question 11. Satisfaction with the training sessions				
What is your opinion regarding the following statements?	1. Strongly disagree	2. Somewhat disagree	3. Somewhat agree	4. Strongly agree
a) The learning materials (i.e., slide shows, handbooks, videos, samples) were useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The training sessions were quite dynamic, in the sense that they were engaging and involved interactive moments, such as problem-based learning, project-based learning, gamification, augmented reality, virtual reality, collaborative learning, etc., instead of being just expositive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The training sessions promoted the use of digital tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) There was a good balance of knowledge among the participants and no big discrepancies in the background knowledge were noticed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) The trainer(s) showed a good performance (good time management, ability to communicate clearly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) The trainer(s) was well prepared and showed a good understanding of the subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) The support provided by the trainer(s) was good and a good management of questions and answers was done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 5: Global evaluation of the course effectiveness

Question 12. Satisfaction with the course effectiveness					
How would you rate your level of satisfaction with...	1. Poorly satisfied	2. Not enough satisfied	3. Satisfied enough	4. Very satisfied	n.a.
a) The knowledge acquired in the training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The skills acquired in the training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The evaluation methods used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 13. Closure		YES	NO
a) Did the course meet your expectations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Would you recommend this course to others?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 14. What was the most positive aspect of the training course? Why?

Question 15. What was the less positive aspect of the training course? Why?

Question 16. Further comments and suggestions:

Your questionnaire is now completed!

Thank you for helping us respond to Europe's AM workforce real needs!

For further information, visit our website www.skills4am.eu

5. The questionnaire for trainers/teachers

The second tool used to gain information on the adequateness of the qualifications and Competence Units and, eventually, identify improvement needs in terms of redesign of qualifications and/or CUs or even in learning tools and contexts used, consists of a questionnaire addressing the trainers/teachers who implement the courses.

5.1 Structure of the questionnaire

The structure of the questionnaire is composed by four parts:

1. Information about the course
2. General aspects of the course
3. Concerning the training programme
4. Concerning the training sessions and achieved results

The questionnaire template to be used is provided next.

Questionnaire Introductory text:

The International AM Qualification System (IAMQS – <https://www.ewf.be/sam>) is composed by a set of qualifications for different proficiency levels in the field of AM technologies, grounded in industry requirements, covering qualifications in metal AM processing for Operators, Designers, Supervisors, Inspectors, Coordinators and Engineers and one qualification in polymers for Designers. The system is implemented through international qualification guidelines (aligned with industrial requirements) and settles on robust quality assurance procedures to ensure a harmonised delivery of training in several countries and regions across the globe. Its modus operandi is designed in a modular and flexible way, which enables its continuous update of according to the industrial requirements.

We would like to get your impressions on the training course you have now run, to make sure any improvement opportunity is identified and proceed with adjustments to qualifications (or parts of it) deemed necessary.

For each topic presented below, please, indicate your degree of satisfaction from a range of 1 to 4 (1 – Very dissatisfied, 2 -Dissatisfied, 3 -Satisfied, 4 – Very satisfied.).

It only will take you a couple of minutes to fill in.

Questionnaire:

Section 1: Information about the course

Question 1. Which course did you implement? *

Option 1

Option 2

Option 3

* Options will depend on the courses offered by the training provider

Question 2. In which country did the course take place?

Austria

Belgium

Bulgaria

Croatia

Republic of Cyprus

Czech Republic

Denmark

Estonia

Finland

France

Germany

Greece,

Hungary

Ireland

Italy

Latvia

Lithuania

Luxembourg

Malta

Netherlands
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden
UK
Other (please specify which)

Section 2: General aspects of the course

Question 3. How satisfied are you with the...	1	2	3	4
support provided by the training provider's staff?				
infrastructure conditions provided by the training institution (furnishing, heating, lighting, sanitation, etc.)?				

Section 3: Concerning the training programme

Question 4. How satisfied are you with the...	1	2	3	4
structure of the course (Units of Learning Outcomes /Competence Units)?				
contents addressed?				
established contact hours?				
balance between theoretical and practical training?				
relationship between the contents and the learning outcomes?				
Question 5. Please, remark three positive aspects of the training course.				
Question 6. What aspects of the course learning programme could be improved?				

Section 4: Concerning the training sessions and achieved results

Question 7. How satisfied are you with the...	1	2	3	4
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available equipment?				
allocated contact hours for the theoretical classes?				
allocated contact hours for the practical work?				
evaluation (tests and examinations) methods used?				

Question 8. Is there any other aspect(s) you would like to refer?

Thank you for helping us respond to Europe's AM workforce real needs!

For further information visit our website www.skills4am.eu

6. Final considerations and recommendations

It was important to consider a monitoring mechanism and respective tools for after the SAM project, to keep feeding the skills forecast capability of the European AM Observatory and the International AM Qualifications System with information that will enable the relevant stakeholders to adjust the AM training offer to meet the future skills needs of the labour market. This kit can support that mechanism and be adapted continuously, in case of need, to be used in all courses that are implemented by AM Authorized Training Bodies. Of course, an alternative mechanism can be defined, but the main point is that there must be a communication channel to gain insights of adjustment needs and tools to collect the feedback of trainees and trainers. This kit is an option for that purpose.

This kit also supported the assessment of the testing/pilot stage in SAM project, in which some qualifications and/or Competence Units were tested and the need for further adjustments was studied. Following this process, a revision of these qualifications/CUs can be carried out, or new qualifications/CUs can be designed. Outputs can then be analysed and implemented according to a defined Methodology for designing/revising Professional Profiles and developing skills.