



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

SEnDIng

D6.5

FINAL INTERNAL EVALUATION REPORT

Editor(s):	Maria Rigou, Vasileios Gkamas
Responsible Organisation(s):	University of Patras
Document Version-Status:	SEnDIng_DLV6.5-final
Submission date:	M38
Dissemination level:	Public

Deliverable factsheet

Project Number: 591848-EPP-1-2017-1-EL-EPPKA2-SSA

Project Acronym: SEnDIng

Project Title: Sector Skills Alliance for the design and delivery of innovative VET programmes to Data Science and Internet of Things professionals

Title of Deliverable: Final internal evaluation report

Work package: WP6 "Quality assurance and evaluation of project"

Task: 6.3 Evaluation of project's outcomes and its impact

Document identifier: SEnDIng_DL6.4-final.docx

Editor(s): Vasileios Gkamas (UPATRAS), Maria Rigou (UPATRAS)

Reviewer(s): Voyiatzis Ioannis (GCS), Teemu Patala (ULS)

Approved by: Maria Rigou (UPATRAS), All partners

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Delivery Slip

	Name	Partner	Date
From	Vasileios Gkamas, Maria Rigou	UPATRAS	25/01/2021
Reviewed by	Voyiatzis Ioannis, Teemu Patala	GCS, ULS	27/01/2021
Approved by	Maria Rigou	UPATRAS	29/01/2021

PROJECT SUMMARY

SEnDIng project aims to address the skills' gap of Data Scientists and Internet of Things engineers that has been identified at the ICT and other sectors (e.g. banking and energy) at which Data Science and Internet of Things have broad applications. To achieve this goal, SEnDIng will develop and deliver to the two aforementioned ICT-related occupational profiles two learning outcome-oriented modular VET programmes using innovative teaching and training delivery methodologies.

Each VET program will be provided to employed ICT professionals into three phases that include: (a) 100 hours of on-line asynchronous training, (b) 20 hours of face-to-face training¹ and (c) 4 months of work-based learning. A certification mechanism will be designed and used for the certification of the skills provided to the trainees of the two vocational programs, while recommendations will be outlined for validation, certification & accreditation of provided VET programs.

Furthermore, SEnDIng will define a reference model for the vocational skills, e-competences and qualifications of the targeted occupational profiles that will be compliant with the European eCompetence Framework (eCF) and the ESCO IT occupations, ensuring transparency, comparability and transferability between European countries.

Various dissemination activities will be performed – including the organization of one workshop at Greece, Bulgaria and Cyprus and one additional conference at Greece at the last month of the project – in order to effectively disseminate project's activities and outcomes to the target groups and all stakeholders. Finally, a set of exploitation tools will be developed, giving guides to stakeholders and especially companies and VET providers, on how they can exploit project's results.

¹ Due to COVID-19 restrictions, this training has been delivered through online sessions

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1 Introduction

The evaluation of SEnDIng project has been done on two different levels:

- Level 1: internal evaluation of main project activities, outputs and impact by SEnDIng partners.
- Level 2: external evaluation of main project activities, outputs and impact by relevant stakeholders

This deliverable is the internal evaluation report of the SEnDIng project (Level 1 evaluation). All SEnDIng partners participated in the internal evaluation of the project aiming to gather their perception about the effectiveness of its implementation, the quality of project outputs and their impact. The evaluation covers 3 different aspects:

- The project activities (A)
- The project outputs (O)
- The project impact (I)

In addition to the internal evaluation of the project, relevant stakeholders external to the project have been asked to evaluate its activities and outputs (Level 2 evaluation). More specific, during the implementation of pilots, the trainees and trainers have been asked to evaluate the following project activities and outputs:

- Online courses at MOOC
- Online training at transversal skills
- Work based learning
- Certification exams

For more information about this evaluation and its results, please refer to the deliverables "D5.3.2: Report about the delivery and certification of Data Science vocational trainings" and "D5.3.3: Report about the delivery and certification of Internet of Things vocational trainings".

In addition, the participants in the workshops and the final conference have been asked to evaluate these events, as well as the impact of the SEnDIng project. For more information, about this evaluation and its results, please refer to the deliverables "D7.6.2": Dissemination report (M13-M24)" and "D7.6.3: Dissemination report (M25-M38)".

2 Evaluation of project activities and outputs

The workplan of the project is divided into the following 7 Work Packages (WPs):

- WP1: Project management and coordination
- WP2: Learning outcomes identification and design of vocational curricula/educational modules and training/ assessment methodology
- WP3: Implementation of training material
- WP4: Implementation of skills certification mechanism
- WP5: Design of e-learning platform and delivery of vocational trainings
- WP6: Quality assurance and evaluation of project
- WP7: Dissemination and Exploitation

In total, 20 persons have participated in the internal evaluation of the project representing all SEnDIng partners. This section presents the results of the evaluation of project activities and outputs per WP. The SEnDIng partners have been asked to evaluate the activities of each WP by providing their input to the following statements:

- A.1 The implementation of the activities was in line with the project plan
- A.2 The quality of the activities was high
- A.3 The timing of the activities was effective
- A.4 The design of the activities was effective
- A.5 The WP leader met the project expectations
- A.6 The partners involved in the WP met the project expectations
- A.7 The project coordinator's support was high

using a scale from 1 (Strongly Disagree/Very Low) up to 5 (Strongly Agree/Very High). Moreover, they have asked to evaluate the outputs produced by each WP using the same scale.

The following table depicts the average values obtained from the evaluation of the WP activities and outputs, while the next subsections of Section 2 provide more details for the evaluation of each separate WP.

Work Packages	Activities	Outputs
WP1	4.6	4.5
WP2	4.7	4.5
WP3	4.7	4.5
WP4	4.6	4.4

WP5	4.6	4.5
WP6	4.7	4.6
WP7	4.7	4.6
Average for all WPs	4.7	4.6

Table 1 - Overall evaluation of WP activities and outputs

2.1 Evaluation of Work Package 1

WP1 concerns the project management and coordination. Figure 1 presents the evaluation of WP1 activities. As it is depicted in the graph, the average score received for each statement is higher than 4.4. The statements that received the highest score are A1, A5 and A7, while the statement received the lowest score is A4.

Evaluation of WP1 activities



Figure 1: Evaluation of WP1 activities

Figure 2 presents the evaluation of WP1 outputs. As it is depicted in the graph, the average score received for each statement is higher than 4.3. The statement that received the highest score is O6, while the statements that received the lowest score are O9 and O10. According to these findings, the SEnDIng partners declared that the quality of the online and face to face project meetings was very high, as well as the quality of the project management plan.

Evaluation of WP1 outputs



Figure 2: Evaluation of WP1 outputs

Figure 3 depicts the partners' perspective with regard to the fulfilment of their expectations from WP1. In conclusion, the SEnDIng partners have evaluated positively the WP1 activities (4.6 average score) and outputs (4.5 average score).

Has WP1 met your expectations?

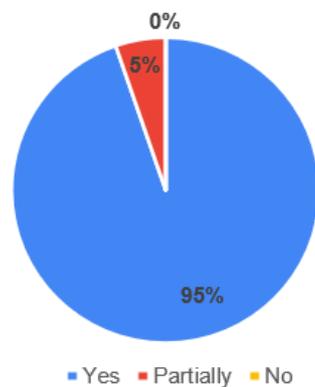


Figure 3: Evaluation of fulfilment of partners' expectations from WP1

2.2 Evaluation of Work Package 2

WP2 concerns the learning outcomes identification and the design of vocational curricula/educational modules and training/assessment methodology. Figure 4 presents the evaluation of WP2 activities. As it is depicted in the graph, the average score received for each statement is higher than 4.5. The statement that received the highest score is A5, while the statement received the lowest score is A3.

Evaluation of WP2 activities

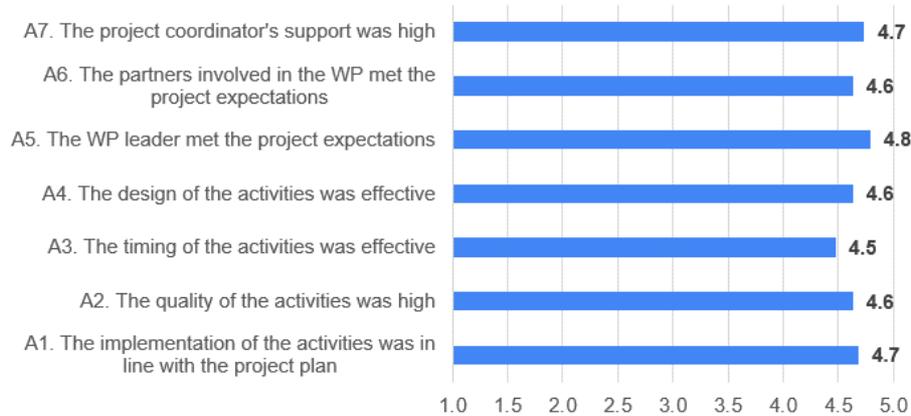


Figure 4: Evaluation of WP2 activities

Figure 5 presents the evaluation of WP2 outputs. As it is depicted in the graph, the average score received for each statement is higher than 4.4. The statements that received the highest score are O2 and O8, while the statement that received the lowest score is O12. According to these findings, the SEnDIng partners declared that the quality of the VET program's learning outcomes, curricula, as well as training methodology was high or very high.

Evaluation of WP2 outputs

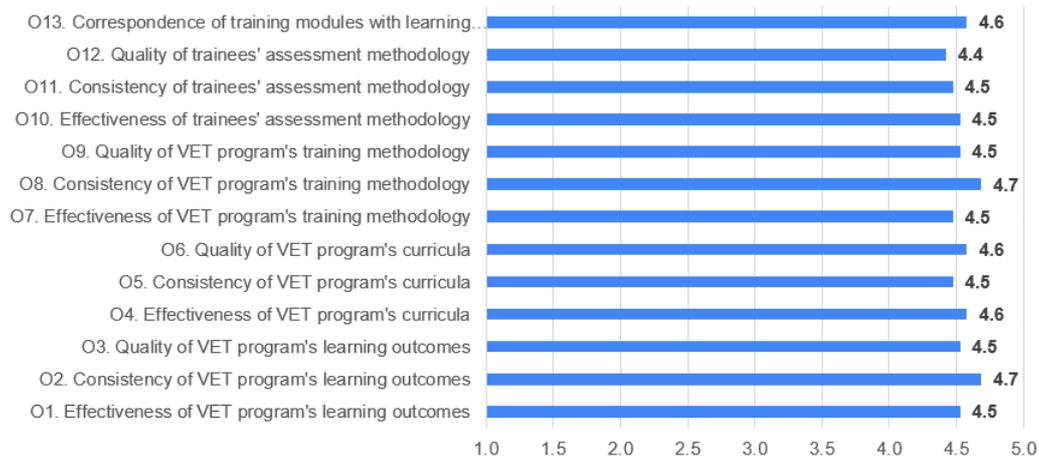


Figure 5: Evaluation of WP2 outputs

Figure 6 depicts the partners' perspective with regard to the fulfilment of their expectations from WP2. In conclusion, the SEnDIng partners have evaluated positively the WP2 activities (4.7 average score) and outputs (4.5 average score).

Has WP2 met your expectations?

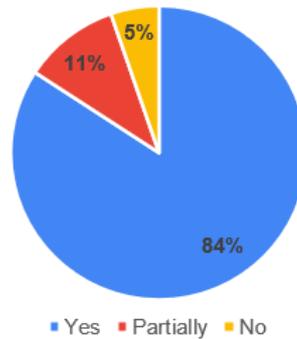


Figure 6: Evaluation of fulfilment of partners' expectations from WP2

2.3 Evaluation of Work Package 3

WP3 concerns the implementation of training material. Figure 7 presents the evaluation of WP3 activities. As it is depicted in the graph, the average score received for each statement is higher than 4.4. The statements that received the highest score are A5 and A7, while the statement received the lowest score is A3.

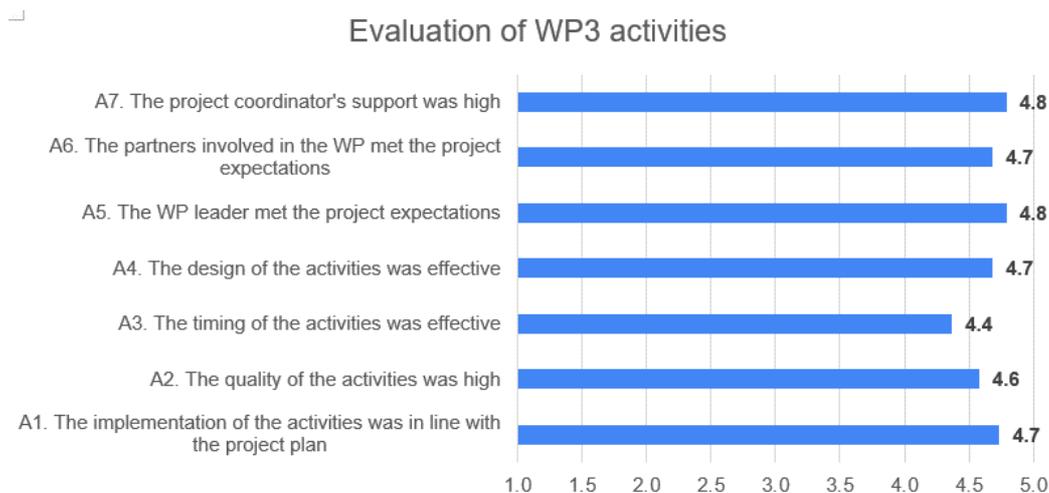


Figure 7: Evaluation of WP3 activities

Figure 8 presents the evaluation of WP3 outputs. As it is depicted in the graph, the average score received for each statement is higher than 4.4. The statements that received the highest score are O1 and O4-O7, while the statement that received the lowest score is O3. According to these findings, the SEnDIng partners declared that the quality of the training material as well as its effectiveness and correspondence to the learning outcomes of the training program was high or very high.

Evaluation of WP3 outputs

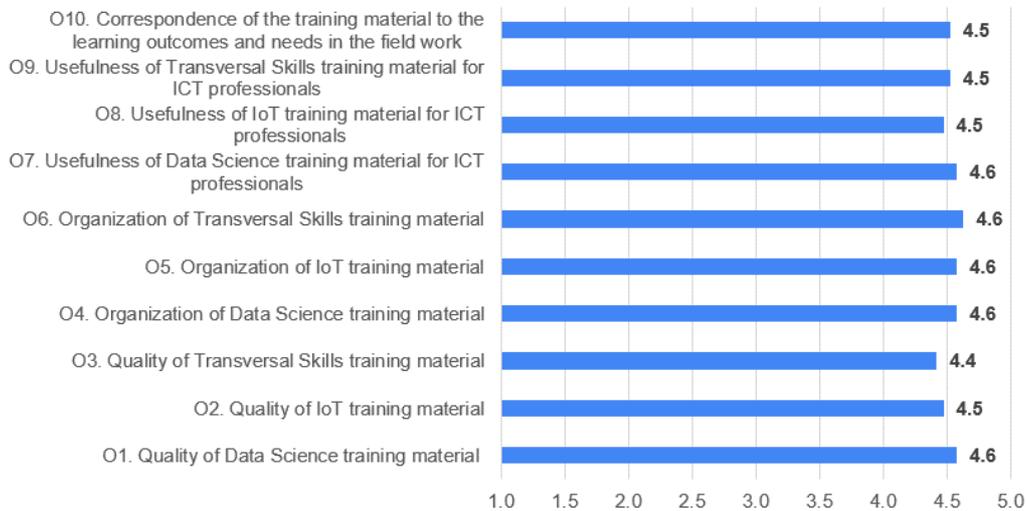


Figure 8: Evaluation of WP3 outputs

Figure 9 depicts the partners' perspective with regard to the fulfilment of their expectations from WP3. In conclusion, the SEnDIng partners have evaluated positively the WP3 activities (4.7 average score) and outputs (4.5 average score).

Has WP3 met your expectations?

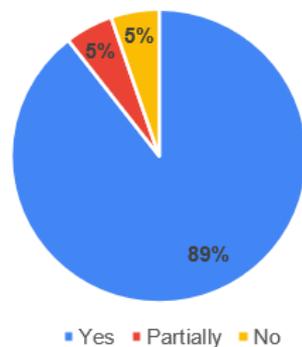


Figure 9: Evaluation of fulfilment of partners' expectations from WP3

2.4 Evaluation of Work Package 4

WP4 concerns the implementation of skills certification mechanism. Figure 10 presents the evaluation of WP4 activities. As it is depicted in the graph, the average score received for each statement is higher than 4.5. The statements that received the highest score are A1 and A5-A7, while the statements received the lowest score are A3 and A4.

Evaluation of WP4 activities



Figure 10: Evaluation of WP4 activities

Figure 11 presents the evaluation of WP4 outputs. As it is depicted in the graph, the average score received for each statement is higher than 4.2. The statements that received the highest score are all except O2 which received the lowest score. According to these findings, the SEnDIng partners declared that the overall certification exams process was effective.

Evaluation of WP4 outputs

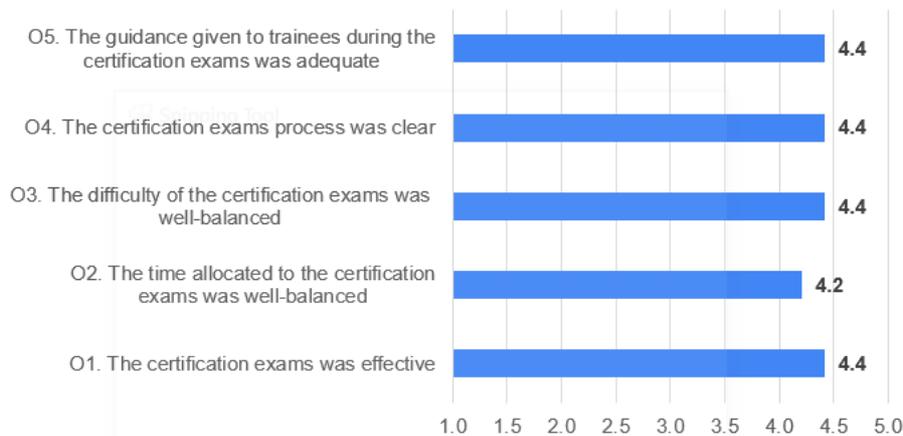


Figure 11: Evaluation of WP4 outputs

Figure 12 depicts the partners' perspective with regard to the fulfilment of their expectations from WP4. In conclusion, the SEnDIng partners have evaluated positively the WP4 activities (4.6 average score) and outputs (4.4 average score).

Has WP4 met your expectations?

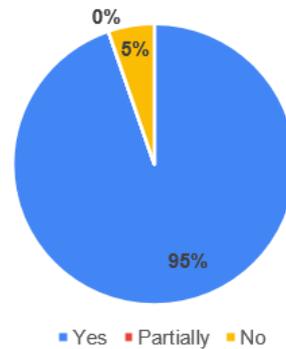


Figure 12: Evaluation of fulfilment of partners' expectations from WP4

2.5 Evaluation of Work Package 5

WP5 concerns the design of the MOOC platform and the delivery of vocational trainings. Figure 13 presents the evaluation of WP5 activities. As it is depicted in the graph, the average score received for each statement is higher than 4.4. The statement that received the highest score is A5, while the statement received the lowest score is A3.

Evaluation of WP5 activities

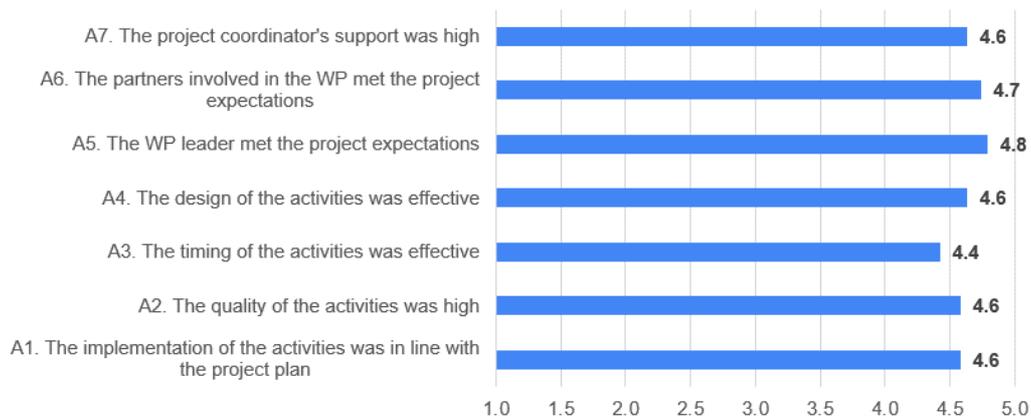


Figure 13: Evaluation of WP5 activities

Figure 14 presents the evaluation of WP5 outputs. As it is depicted in the graph, the average score received for each statement is higher than 4.2. The statements that received the highest score are O1-O3 and O5, while the statement that received the lowest score is O4. According to these findings, the SEnDIng partners agree or strongly agree that the whole vocational training was effective.

Evaluation of WP5 outputs

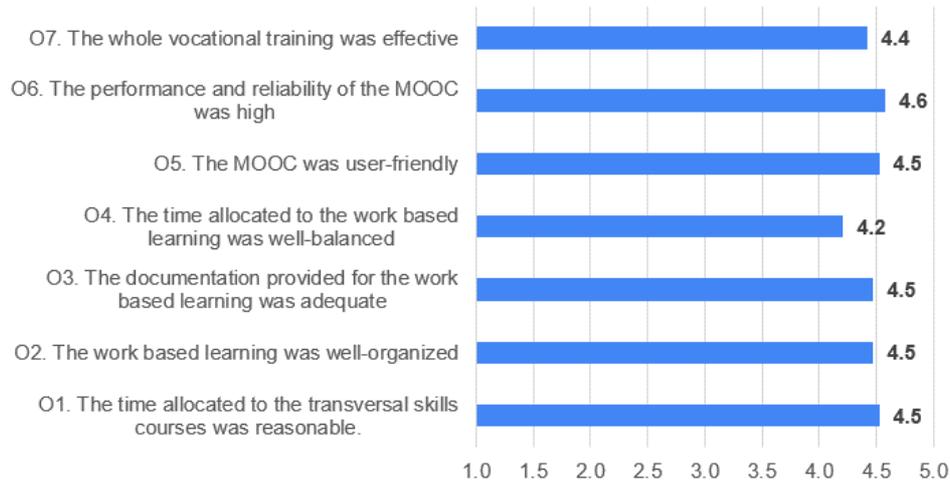


Figure 14: Evaluation of WP5 outputs

Figure 15 depicts the partners' perspective with regard to the fulfilment of their expectations from WP5. In conclusion, the SEnDIng partners have evaluated positively the WP5 activities (4.6 average score) and outputs (4.5 average score).

Has WP5 met your expectations?

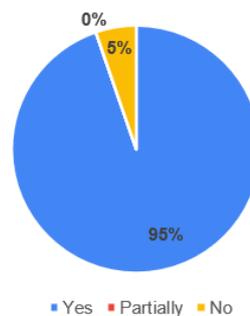


Figure 15: Evaluation of fulfilment of partners' expectations from WP5

2.6 Evaluation of Work Package 6

WP6 concerns the project's quality assurance and evaluation. Figure 16 presents the evaluation of WP6 activities. As it is depicted in the graph, the average score received for each statement is higher than 4.6. The statements that received the highest score are A1, A5 and A7, while the statements received the lowest score are A2 and A3.

Evaluation of WP6 activities



Figure 16: Evaluation of WP6 activities

Figure 17 presents the evaluation of WP6 outputs. As it is depicted in the graph, the average score received for each statement is higher than 4.6. The statement that received the highest score is O4, while the other statements received the lowest score. According to these findings, the SEnDIng partners agree or strongly agree that the project quality assurance and project evaluation was effective.

Evaluation of WP6 outputs

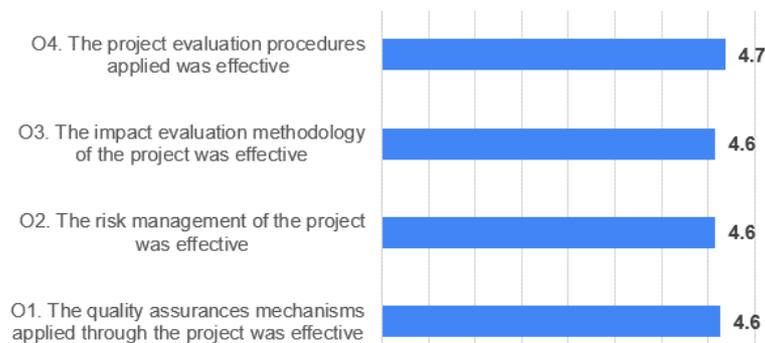


Figure 17: Evaluation of WP6 outputs

Figure 18 depicts the partners' perspective with regard to the fulfilment of their expectations from WP6. In conclusion, the SEnDIng partners have evaluated positively the WP6 activities (4.7 average score) and outputs (4.6 average score).

Has WP6 met your expectations?

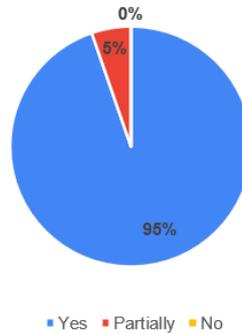


Figure 18: Evaluation of fulfilment of partners' expectations from WP6

2.7 Evaluation of Work Package 7

WP7 concerns the project's dissemination and exploitation activities. Figure 19 presents the evaluation of WP7 activities. As it is depicted in the graph, the average score received for each statement is higher than 4.6. The statements that received the lowest score are A2 and A3, while the other statements received the highest score.

Evaluation of WP7 activities



Figure 19: Evaluation of WP7 activities

Figure 20 presents the evaluation of WP7 outputs. As it is depicted in the graph, the average score received for each statement is higher than 4.5. The statements that received the highest score are O6 and O7, while the statements O2-O4 received the lowest score. According to these findings, the SEnDIng partners agree or strongly agree that the project dissemination was effective and met their expectations.

Evaluation of WP7 outputs

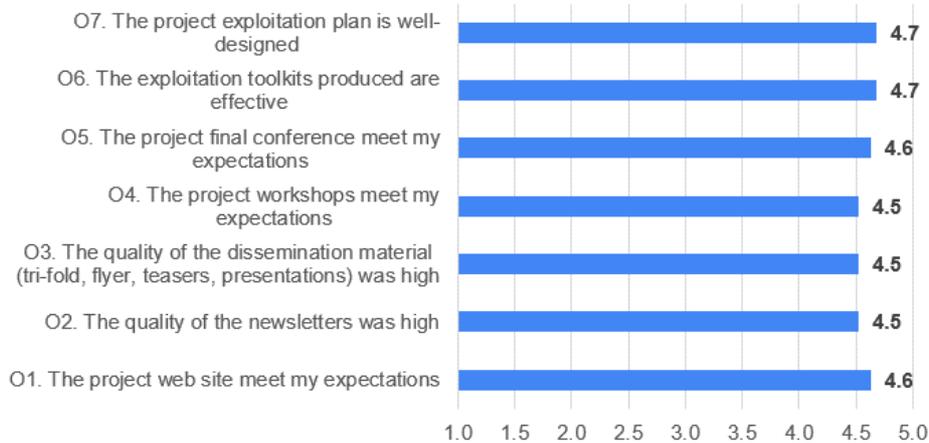


Figure 20: Evaluation of WP7 outputs

Figure 21 depicts the partners' perspective with regard to the fulfilment of their expectations from WP7. In conclusion, the SEnDIng partners have evaluated positively the WP6 activities (4.7 average score) and outputs (4.6 average score).

Has WP7 met your expectations?

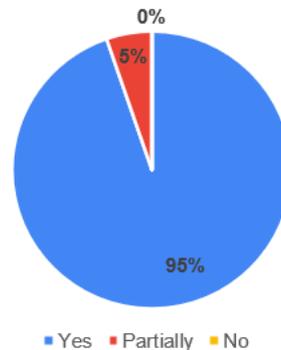


Figure 21: Evaluation of fulfilment of partners' expectations from WP7

3 Evaluation of project impact

This section presents the results of the evaluation of project impact. The SEnDIng partners have been asked to evaluate the following potential impact of the project using a scale from 1 (Very Low) up to 5 (Very High).

- I1. Up-skilling of ICT professionals and especially Data Scientists and IoT engineers in order to meet new challenges in the work field.
- I2. Training in skills and competences that are more tailored to the needs of ICT professionals.

- I3. Development of a more aware and flexible mind-set amongst ICT professionals.
- I4. More interactive learning opportunities via the use of new teaching and learning technologies for learners.
- I5. Reduced training expenses for enterprises and other organizations due to the free access to the VET programs.
- I6. Free access to learning opportunities and training methodologies for ICT businesses that lack training facilities and departments.
- I7. Ability of ICT professionals throughout Europe to respond to the needs of different ICT markets and other sectors like banking, insurance and energy.

Figure 22 presents the average values obtained for each evaluated impact parameter. As it is depicted in the graph, the average score received for each parameter is higher than 4.4. The impact parameters that received the highest score are I4-I6, while the impact parameter I3 received the lowest score. According to these findings the partners believe that the impact of the project is high or very high.

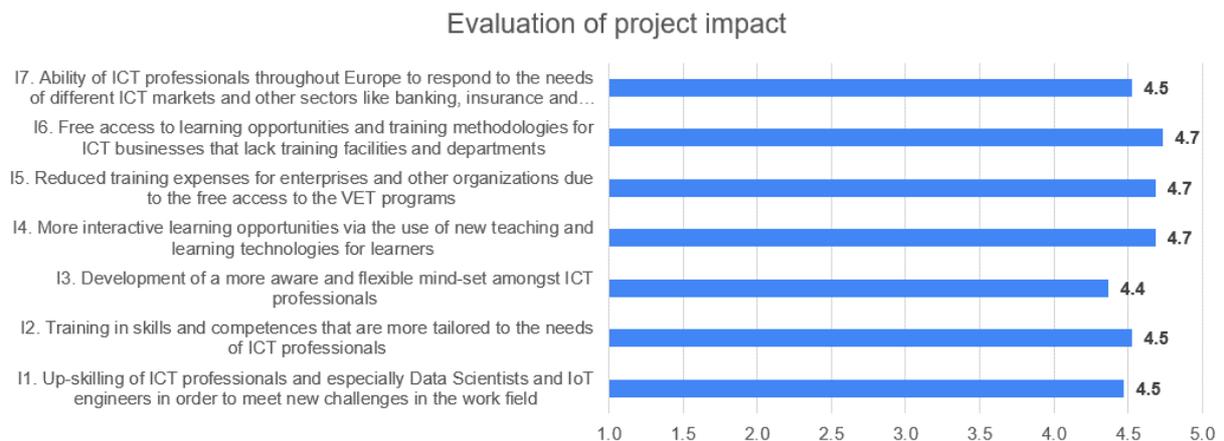


Figure 22: Evaluation of project impact

Figure 23 presents the possibility of exploitation of project's outputs by SEnDIng partners. As it is depicted in the graph, the possibility of exploitation of project's outputs by SEnDIng partners is very high (average value 4.6).

Possibility of exploitation of project's outputs

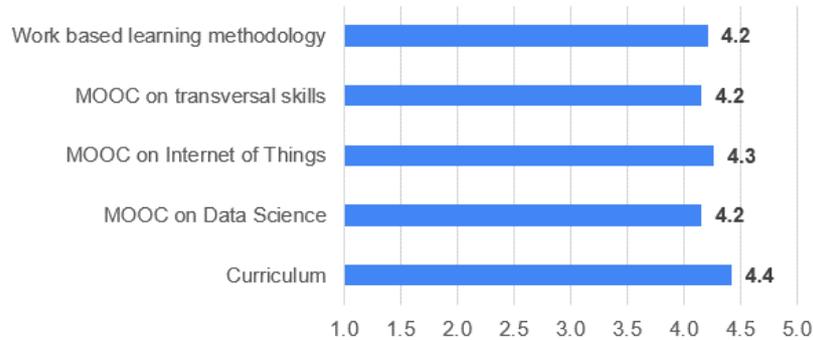


Figure 23: Possibility of exploitation of project's outputs

Finally, Figure 24 presents the partners perspective with regard to the evaluation of SEnDIng training program. As it is depicted in the graph, 95% of the respondents declared that the training program meets or partially meets the real needs of the market, while just 5% of the respondents declared that it does not meet the real needs of the market. Moreover, 89% of the respondents declared that the SEnDIng training program can contribute to the elimination of the skills gap in the Data Science and IoT domains.

Evaluation of SEnDIng training program

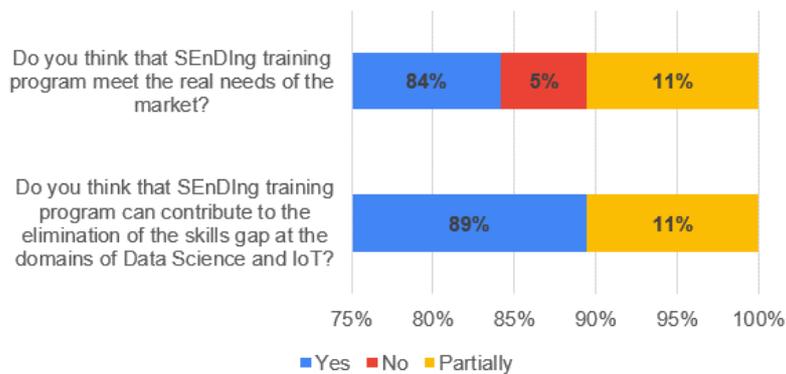


Figure 24: Evaluation of SEnDIng training program

4 Overall project evaluation

This section presents the partners overall perspective with regard to:

- Quality of the project design and implementation
- Project consortium and cooperation among partners
- Project impact and sustainability
- Quality and effectiveness of dissemination activities

Quality of the project design and implementation

The project was well designed following a traditional approach to develop the activities phase by phase. Each stage was based on the previous results and further developed the corresponding outcomes towards achieving the project results. The implementation went smoothly according to the plan, until the moment in which the COVID-19 crisis severely affected all the partners. In a relevantly short time, the team reorganized its activities in online coordination and delivery mode. Although the reorganization required extra efforts that were not planned, all partners were able to adapt and execute the planned activities using online channels. One could consider adjusting and reorganizing the project activities for achieving its goals, as a clear indicator of the high quality of the project design and implementation.

Project consortium and cooperation among partners

The project partners promptly cooperated for the whole period of the project and they were able to collaborate in the development of the project outputs. During the development phase, the relevant partners cooperated to produce the desired results and involve the target groups in piloting the Data Science and Internet of Things trainings. Quality checks and peer reviews were organized to verify and validate the quality of the final results. Moreover, the feedback provided by each partner to the whole project team was promptly discussed and taken into account when evaluated as beneficial for the project.

Project impact and sustainability

The project had a positive impact not only on the end-users –trainees- but also on various other stakeholders such as companies, industry associations, and educational organizations (e.g., VET providers and HEIs) involved in the project. The impact was in a few directions: utilizing the already created content, providing training, and bringing to the relevant stakeholders' agenda the importance of the Data Science and Internet of Things, as essential technologies that will positively influence the industry competitiveness.

Moreover, the project strengthened the SEnDIng partners capabilities to design and deliver practical educational programs to benefit the industry.

Quality and effectiveness of dissemination activities

The dissemination was effective taking into account the COVID-19 restrictions. The project goals and potential benefits have been communicated to a number of companies, training providers, and key industry associations using both offline and online channels. Although the COVID-19 restrictions negatively influenced our ability to socialize and closely communicate with relevant stakeholders at the end of the project lifetime, we can consider the dissemination goals as achieved in terms of quality and quantity.

5 Conclusions

Based on the results of the project evaluation performed by SEnDIng partners, the project can be considered successful. The overall quality of the project activities is high, while the quality of the outputs produced is also high. The impact of the project can be considered important for the SEnDIng partners (given their intention to exploit the produced outputs), other relevant stakeholders (e.g., companies, ICT professionals, VET providers, etc.) and the broader ICT sector. SEnDIng will pave the way for other sectors as well, for seeking the professional and personal development of Data Scientists and IoT professionals. Moreover, companies will exploit opportunities for continuous learning of their employees and change their mindset for the role of VET in the life-long learning of workforce.

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