

Intellectual Output 2

A4: Validation exercises

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1. IPinSTEAM project

1.1 The context

On the point of creativity and innovation being the roots of European cultural and socio-economic growth, respecting others' work becomes a far-reaching need both for professional and personal development of individuals (EUIPO, 2017). On the other hand, nowadays that online sharing of information is rife, one cannot help but wonder whether people are aware of proper ways to attribute others' ideas along with the necessity to reap the benefits of intellectual potential given the fact that most innovations are now highly related to technology.

Au contraire, the absence of Intellectual Property (IP) protection of educational materials and innovations – with online learning only deteriorating the situation – reveals a significant problem in many European countries. In fact, while uncontrolled access is given to educational resources across the Web, the majority of learners are not aware if IP is implemented in their work as well as ways to protect their own intellectual property (Evans, 2016).

On the grounds that STEAM comprises continuous innovation, invention, discovery and understanding of technical knowledge that lead to (commercial) products, the protection of inventions becomes more and more complex (National Inventor Hall of Fame, 2019). Conceivably, this reveals the rationale behind the lack of IP in school education. In particular, recent research has depicted the knowledge and implementation gaps related to IP, resulting in lack of knowledge about working definitions of IP in the field of Arts. In conjunction with the fact that most European countries are not in position to capture the relevance of IP in STEM, the need to integrate IP in STEAM curricula becomes even more significant (Office for Harmonization in the Internal Market, 2015).

1.2 Objectives

In order to address the lack of IP knowledge resulting in an inefficient implementation of IP in the world of inventions, the **IPinSTEAM project** aims at promoting IP strategies in schools and more specifically in STEAM education under the prism of confronting this issue from its roots. To generate awareness about Intellectual Property across European educational institutions, the project will develop an innovative ICT-enabled training package focused on the needs of K-12 STEAM teachers.

Towards that purpose, the project will develop and validate training materials tailored to the real needs of school teachers, educational institutions and STEAM departments towards giving shape to the integration of IP concepts into STEAM curricula.

1.3 Target groups

The **direct target group** of the project involves STEAM teachers, mainly primary school and lower secondary school teachers (ages up to 12). They will learn the key concepts of Intellectual Property along with useful information and guidelines about ways to efficiently implement IP strategies in STEAM-related subjects and integrate them into their curricula. By all means, all school STEAM departments can be regarded as direct target group of the project.

The **indirect target audience** of the project comprises:

- Students up to 12 years old
- Schools and educational institutions teaching STEAM-related subjects
- Law schools and departments
- Policy makers responsible for the design and implementation of actions relevant to ICT strategies for educational purposes
- Other institutions or organizations that are active in school education
- Authorities or organizations that can organize specific actions in order to contribute to the development of high-quality education
- Networks, voluntary associations and other NGOs that are active in school education
- Research communities active in the broader field of lifelong learning.

2. National report

2.1 Objectives

The objective of the present report is to present the results of the validation activities performed with representatives of the target group at national level. Each partner will have to engage at least 20 teachers and 5 students to validate the project outcomes, collecting the results of the validation questionnaires for teachers and for students. The aim is to receive valuable feedback towards continuous improvement.

2.2 Questionnaire for teachers

Please score the following statements considering the scale:

1 = Completely Disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Completely agree.

	1.	2.	3.	4.	5.
The topics and contents addressed by the Gamified Mediator were relevant					
The scenarios proposed in the Gamified Mediator were adequate to the acquisition of knowledge on Intellectual Property (IP)					
The scenarios proposed in the Gamified Mediator were relevant/significant for teaching IP concepts on STEAM subjects					
The tips/feedback provided were adequate and relevant					
The proposed scenarios were original					
The proposed scenarios were adapted to the target-group					
The overall visual design of the Gamified Mediator was adequate					
The text was legible					
The animations used in the Gamified Mediator were adequate					
The proposed scenarios promoted students' engagement					
The proposed scenarios allowed the acquisition of knowledge in a fun and enjoyable way					
My general evaluation of the Gamified Mediator is positive					

Please, feel free to add anything you find relevant regarding the Gamified Mediator.

2.3 Questionnaire for students

Please score the following statements considering the scale:

1 = Completely Disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Completely agree.

	1.	2.	3.	4.	5.
<i>The topics and contents addressed by the Gamified Mediator were relevant</i>					
The Gamified Mediator helped me to understand better the importance of Intellectual Property in STEAM subjects					
The Gamified Mediator gave me important knowledge and resources to apply Intellectual Property in STEAM subjects					
The proposed scenarios were original					
I enjoyed the Gamified Mediator					
The overall visual design of the Gamified Mediator was adequate					
The text was legible					
The animations used in the Gamified Mediator were adequate					

The tips/feedback were useful for clarifications

The proposed scenarios allowed me the acquisition of knowledge in a fun and enjoyable way

I would recommend this Gamified Mediator to others

My general evaluation of the Gamified Mediator is positive

Please, feel free to add anything you find relevant regarding the Gamified Mediator.

3. Conclusions

EA conducted the validation exercises of the second Intellectual Output (IO2) in Greece, partly in parallel with the training seminars to teachers or soon after its completion (in late May and June 2022). Ample time was then given to them to study and assess the training material and in particular to interact and explore the Gamified Mediator/Demonstrator and provide feedback themselves but also their students through the standard questionnaires.

In total feedback was received from 23 teachers and 15 students which is presented below numerically along with the main findings concluding this report.

3.1 Questionnaire for teachers – Analysis and Results

Teachers were invited and guided to explore the learning content of the Gamified Demonstrator and if possible to go through all IP themes/modules (Design, Trademarks, Copyright and Patents) and STEAM subjects (Robotics, 3D-Printing, Physics, Mathematics, Environmental Engineering and Social Studies) in order to provide comprehensive feedback, overall corrections or suggestions for improvement.

Regarding the quantitative assessment of the Gamified Demonstrator (IO2), the grand majority of feedback results are very positive, with the standardized statements to questionnaire's questions being answered in great majority with "agree" or "completely agree". The respective average and percentage of standardized answers to each question is as follows:

1 = Completely Disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Completely agree.

	Avg.Answer	Avg in %
Q1 The topics and contents addressed by the Gamified Mediator were relevant	4.74	94.8%
Q2 The scenarios proposed in the Gamified Mediator were adequate to the acquisition of knowledge on Intellectual Property (IP)	4.70	93.9%
Q3 The scenarios proposed in the Gamified Mediator were relevant/significant for teaching IP concepts on STEAM subjects	4.61	92.2%
Q4 The tips/feedback provided were adequate and relevant	4.57	91.3%
Q5 The proposed scenarios were original	4.74	94.8%
Q6 The proposed scenarios were adapted to the target-group	4.30	86.1%
Q7 The overall visual design of the Gamified Mediator was adequate	4.70	93.9%
Q8 The text was legible	4.22	84.3%
Q9 The animations used in the Gamified Mediator were adequate	4.65	93.0%
Q10 The proposed scenarios promoted students' engagement	4.70	93.9%
Q11 The proposed scenarios allowed the acquisition of knowledge in a fun and enjoyable way	4.83	96.5%
Q12 My general evaluation of the Gamified Mediator is positive	4.78	95.7%

In conclusions the overall teacher assessment of IO2 is highly positive without any particular concerns or corrections or topics of potential misunderstanding mentioned in final comments or request for clarification. Teachers were engaged in the validation task and although it was time consuming they completed it within reasonable interval after the assignment. Therefore we can conclude that the learning content developed and offered through the Gamified Mediator/Demonstrator (IO2) is of high quality and well structured and organized to address its learning objectives and target audience.

3.2 Questionnaire for students – Analysis and Results

Validation questionnaires for IO2 were also handed to students by teachers so that they can provide their feedback as well on volunteering basis. 15 completed set of answers were collected and analysed.

The overall assessment of students is also very positive, with the standardized statements to questionnaire's questions being answered in great majority with "Agree" or "Completely agree". The respective average and percentage of standardized answers to each question is as follows:

1 = Completely Disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Completely agree.

		Avg.Answer	Avg in %
Q1	The topics and contents addressed by the Gamified Mediator were relevant	4.53	90.7%
Q2	The Gamified Mediator helped me to understand better the importance of Intellectual Property in STEAM subjects	4.87	97.3%
Q3	The Gamified Mediator gave me important knowledge and resources to apply Intellectual Property in STEAM subjects	4.60	92.0%
Q4	The proposed scenarios were original	4.60	92.0%
Q5	I enjoyed the Gamified Mediator	4.73	94.7%
Q6	The overall visual design of the Gamified Mediator was adequate	4.67	93.3%
Q7	The text was legible	4.47	89.3%
Q8	The animations used in the Gamified Mediator were adequate	4.80	96.0%
Q9	The tips/feedback were useful for clarifications	4.73	94.7%
Q10	The proposed scenarios allowed me the acquisition of knowledge in a fun and enjoyable way	4.87	97.3%
Q11	I would recommend this Gamified Mediator to	4.73	94.7%

others

**Q12 My general evaluation of the Gamified
Mediator is positive**

4.87 97.3%

In conclusion the overall assessment of students of IO2 is quite positive without any particular difficulties or concerns mentioned in final comments by themselves or their teachers. The students who voluntarily participated in the validation task were really engaged in the activities as they experienced it more as fun and closer to play or gaming than ordinary educational task. Therefore we can conclude with confidence that the learning content developed in IO2 and presented in Gamified Demonstrator/Mediator is of high educational value, with clear objectives and structure, and also well designed for in-classroom implementation in schools.