Intellectual Output 1

A6: Validation exercises

Deliverable: A6

IPin STEAM

30.6.2022

INOVA+
Authored by: INOVA+ team
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REVISION HISTORY

Version	Date	Author	Description	Action	Pages
1.0	18/02/2022	INOVA+	Creation	C	TBS

(*) Action: C = Creation, I = Insert, U = Update, R = Replace, D = Delete

REFERENCED DOCUMENTS

ID	Reference		Title
1	2020-1-UK01-KA201-078934		IPinSTEAM Proposal
2			

APPLICABLE DOCUMENTS

ID	Reference		Title
1			
2			

Contents

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 a 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

	3d Printing	Environmental Engineering	Mathematics	Physics	Robotics	Social Studies
Which subject did you test?						

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.*
	General assessment				
The course structure was adequate.					

The topics and contents of the course addressed were relevant					
The contents of the course were consistent with the proposed learning objectives					
The activities and exercises proposed during the lesson plans were adequate to the acquisition of knowledge on Intellectual Property (IP)					
The contents of the lesson plans were relevant/significant for the teaching of IP concepts on STEAM subjects					
The course workload was adequate					
The proposed activities were original					
The proposed activities were adapted to the target-group					
The students were engaged in the course.					
The technologies, materials and resources used were effective.					
My general evaluation of the course is positive.					
Modules assessment					
About Module 1 Design: The objectives of the module and the lesson plan were clear					
About Module 1 Design: The content was organized and well planned					
About Module 1 Design: The contents of the lesson plan were easily applied in the classroom					

About Module 1 Design: The suggested materials to be presented were clear and appropriate					
About Module 1 Design: The duration of the activities was adequate according to the objectives					
About Module 1 Design: The key questions for knowledge testing were adequate					
About Module 2 Trademarks: The objectives of the module and the lesson plan were clear					
About Module 2 Trademarks: the content was organized and well planned					
About Module 2 Trademarks: The contents of the lesson plan were easily applied in the classroom					
About Module 2 Trademarks: The suggested materials to be presented were clear and appropriate					
About Module 2 Trademarks: The duration of the activities was adequate according to the objectives					
About Module 2 Trademarks: The key questions for knowledge testing were adequate					
About Module 3 Copyright: The objectives of the module and the lesson plan were clear					
About Module 3 Copyright: The content was organized and well planned					
About Module 3 Copyright: The contents of the lesson plan were easily applied in the classroom					
About Module 3 Copyright: The suggested materials to be presented were clear and appropriate					
About Module 3 Copyright: The duration of the activities was adequate according to the objectives					
About Module 3 Copyright: The key questions for knowledge testing were adequate					
About Module 4 Patents: The objectives of the module and the lesson plan were clear					

About Module 4 Patents: The content was organized and well planned					
About Module 4 Patents: The contents of the lesson plan were easily applied in the classroom					
About Module 4 Patents: The suggested materials to be presented were clear and appropriate					
About Module 4 Patents: The duration of the activities is adequate according to the objectives					
About Module 4 Patents: The key questions for knowledge testing were adequate					

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

2.3 Questionnaire for students

	3d Printing	Environmental Engineering	Mathematics	Physics	Robotics	Social Studies
Which subject did you test?						

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.*
	General assessment				
My expectations regarding the course were met					
The course helped me to understand better the importance of Intellectual Property in STEAM subjects					

The course gave me important knowledge and resources to apply Intellectual Property in STEAM subjects					
The topics and contents of the course were relevant					
The duration of the course was adequate to its objectives					
The proposed activities were original					
I enjoyed to participate in the course					
The teacher(s) was/were knowledgeable on the theme of Intellectual Property application in STEAM subjects					
The teacher(s) was/were available for any clarification					
The technologies, materials and resources used were effective					
I would recommend this course to others					
My general evaluation of the course is positive					
	Modules assessment				
About Module 1 Design: the objectives of the module and the lesson plan were clear					
About Module 1 Design: the content was organized and well planned					

About Module 1 Design: the materials and resources were appropriate					
About Module 1 Design: the duration of the activities was adequate according to the objectives					
About Module 1 Design: I was confident in completing the key questions for knowledge testing					
About Module 1 Design: my evaluation of the module is positive					
About Module 2 Trademarks: the objectives of the module and the lesson plan were clear					
About Module 2 Trademarks: the content was organized and well planned					
About Module 2 Trademarks: the materials and resources were appropriate					
About Module 2 Trademarks: the duration of the activities was adequate according to the objectives					
About Module 2 Trademarks: I was confident in completing the key questions for knowledge testing					
About Module 2 Trademarks: my evaluation of the module is positive					
About Module 3 Copyright: the objectives of the module and the lesson plan were clear					
About Module 3 Copyright: the content was organized and well planned					
About Module 3 Copyright: the materials and resources were appropriate					

About Module 3 Copyright: the duration of the activities was adequate according to the objectives					
About Module 3 Copyright: I was confident in completing the key questions for knowledge testing					
About Module 3 Copyright: my evaluation of the module is positive					
About Module 4 Patents: the objectives of the module and the lesson plan were clear					
About Module 4 Patents: the content was organized and well planned					
About Module 4 Patents: the materials and resources were appropriate					
About Module 4 Patents: the duration of the activities was adequate according to the objectives					
About Module 4 Patents: I was confident in completing the key questions for knowledge testing					
About Module 4 Patents: my evaluation of the module is positive					

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

3. Conclusions

The first Intellectual Output of the IPinSTEAM project comprises the “IPinSTEAM Training Course”, a modular training course aiming to promote key concepts related to IP and ways to implement it in STEAM subjects. This training course is comprised of lesson plans for six STEAM subjects: 3D Printing, Environmental Engineering, Mathematics, Physics, Robotics, and Social Studies, each one comprised of four modules that cover the IP concepts, namely: Design, Trademarks, Copyright and Patents. The main objective of this training course is to raise awareness about relevant concepts on IP and to empower teachers to integrate them to STEAM teaching.
IPinSTEAM partnership performed the validation activities of the IPinSTEAM Training Course with representatives of the target group at national level in order to gather and analyse their valuable feedback regarding this result.

3.1 Validation exercises in Portugal

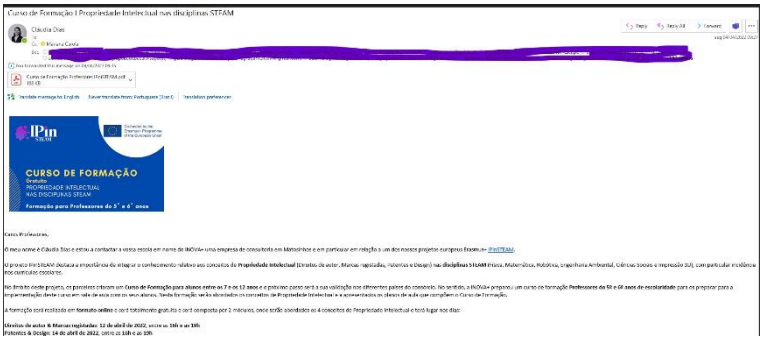
To conduct the validation exercises of the first Intellectual Output in Portugal, INOVA+ prepared and delivered a 2-day training course directed to Portuguese primary school and lower secondary school teachers (ages up to 12) in order to present them the IPinSTEAM training course and to prepare them to implement it in their classroom with their students.

To disseminate this training course, different approaches and channels were used:

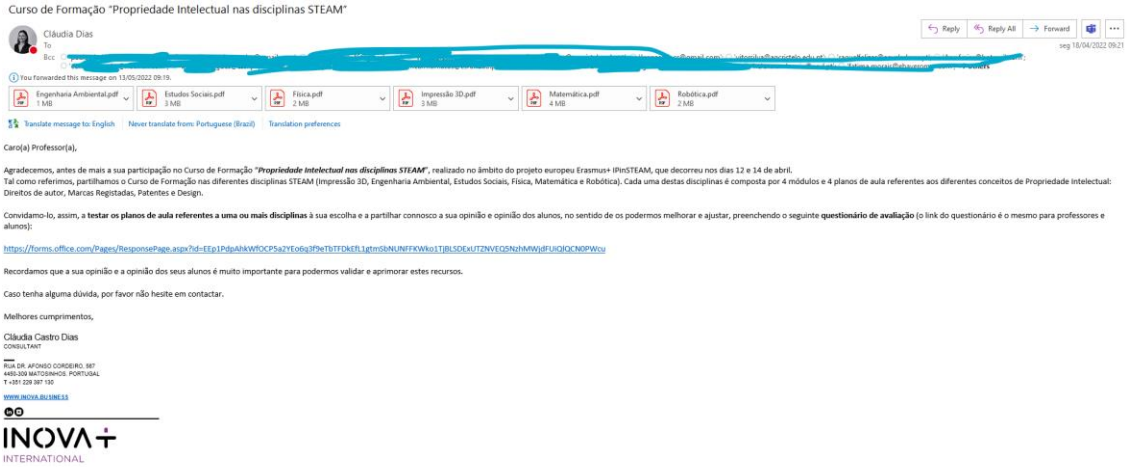
1. Dissemination through INOVA+ social media channels:

2. Dissemination in meetings and events of different projects:

3. Dissemination through email to the school directors of Portuguese schools:



The training took place on the 12th and the 14th of April 2022, being facilitated online by INOVA+. The first session was dedicated to copyright and trademark modules and the second session was dedicated to design and patents modules. The training counted with the participation of 15 teachers in the first session and 7 in the second session.
After participating in the training, the teachers received the lesson plans and were invited to test the training course for one or more subjects in the classroom with their students and to complete the questionnaire for teachers. Teachers were also asked to invite their students to complete the students' questionnaire after the testing.



Curso de Formação "Propriedade Intelectual nas disciplinas STEAM"

Cláudia Dias
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Caro(a) Professor(a),

Agradecemos, antes de mais a sua participação no Curso de Formação "***Propriedade Intelectual nas disciplinas STEAM***", realizado no âmbito do projeto europeu Erasmus+ IPinSTEAM, que decorreu nos dias 12 e 14 de abril.
Tal como referimos, partilhamos o Curso de Formação nas diferentes disciplinas STEAM (Impressão 3D, Engenharia Ambiental, Estudos Sociais, Física, Matemática e Robótica). Cada uma destas disciplinas é composta por 4 módulos e 4 planos de aula referentes aos diferentes conceitos de Propriedade Intelectual: Direitos de autor, Marcas Registadas, Patentes e Design.

Convidamo-lo, assim, a **testar os planos de aula referentes a uma ou mais disciplinas** à sua escolha e a partilhar connosco a sua opinião e opinião dos alunos, no sentido de os podermos melhorar e ajustar, preenchendo o seguinte **questionário de avaliação** (o link do questionário é o mesmo para professores e alunos):

https://forms.office.com/Pages/ResponsePage.aspx?id=EEp1PdpAhkWfOCP5a2YEo6g3f9eTbTFDkEfL1gtm5bNUNFFKWko1TjBLSDExUTZNVEQSNzhMWjdFUiQlQCN0PWcu

Recordamos que a sua opinião e a opinião dos seus alunos é muito importante para podermos validar e aprimorar estes recursos.

Caso tenha alguma dúvida, por favor não hesite em contactar.

Melhores cumprimentos,

Cláudia Castro Dias
CONSULTANT

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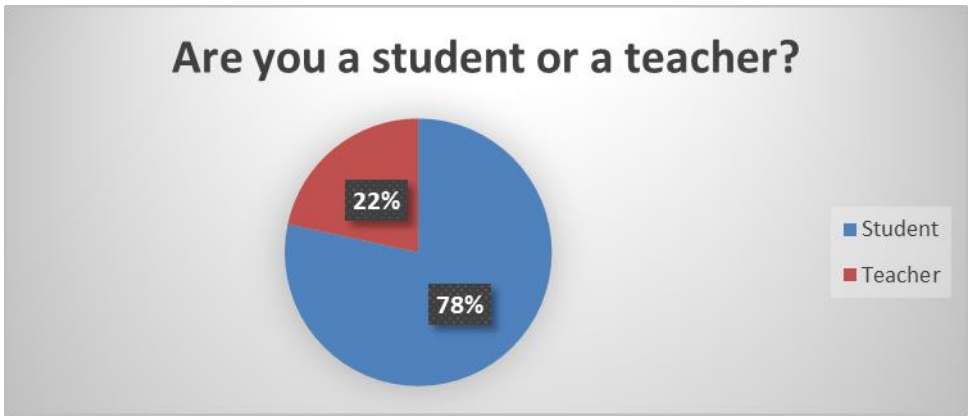
Besides the training course, relevant stakeholders from the target groups were also approached by email and invited to test the training course and to complete the questionnaire.

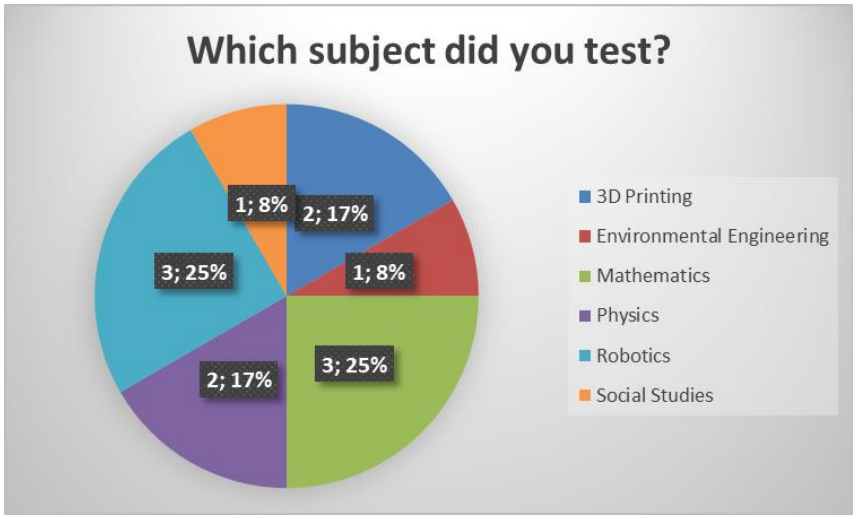
The validation exercises took place between 18th of April 2022 and 30th of June 2022 and INOVA+ managed to reach a total of 37 participants, comprised of 8 teachers and 29 students.



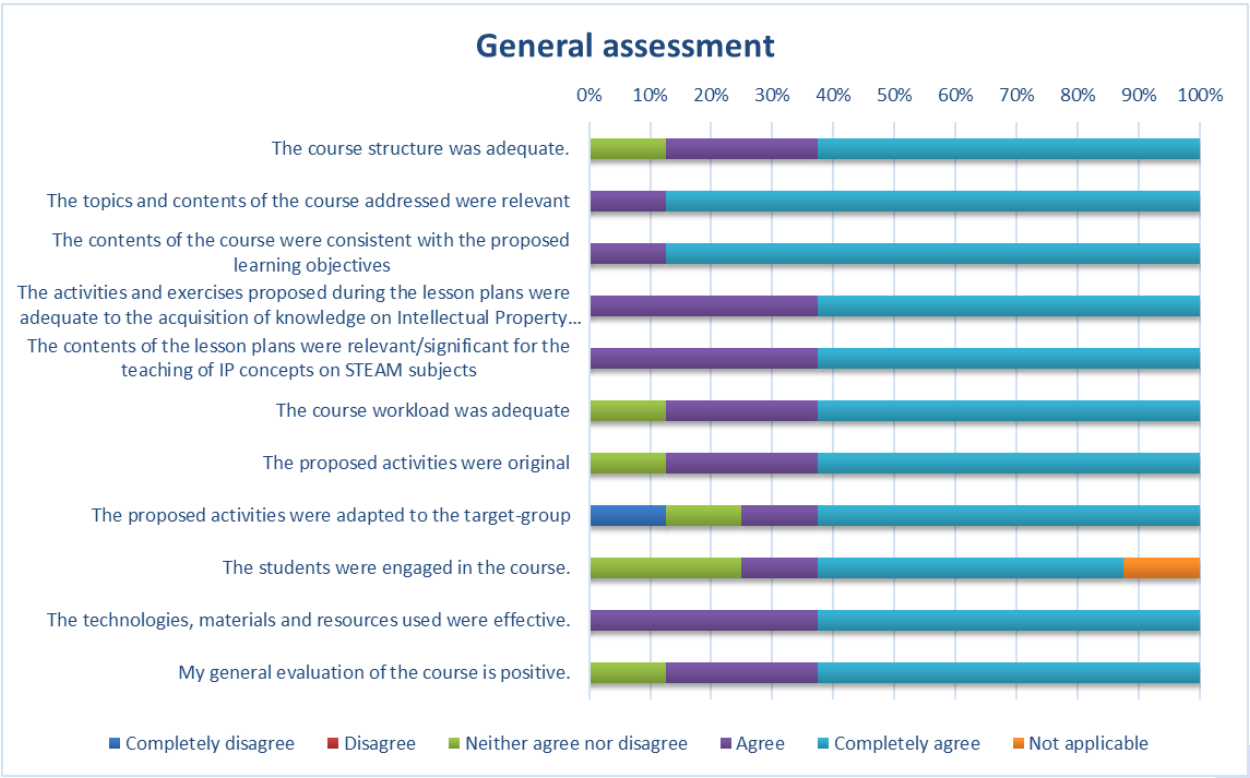
For this report's purposes, the results retrieved from the questionnaires for teachers and the questionnaires for students will be analysed separately, in order to assure a more accurate and detailed report of the findings.

3.1.1 Questionnaire for teachers: results and analysis

Teachers were invited to test one or more subjects. In sum, all subjects were tested by the teachers, with Mathematics and Robotics being the more tested subjects, as presented in the graphic below:



Regarding the general assessment of the training course, the results showed positive feedback from the teachers, with all the statements being rated by more than 60% of the teachers with “agree” or “completely agree”, as shown in the graphic below:

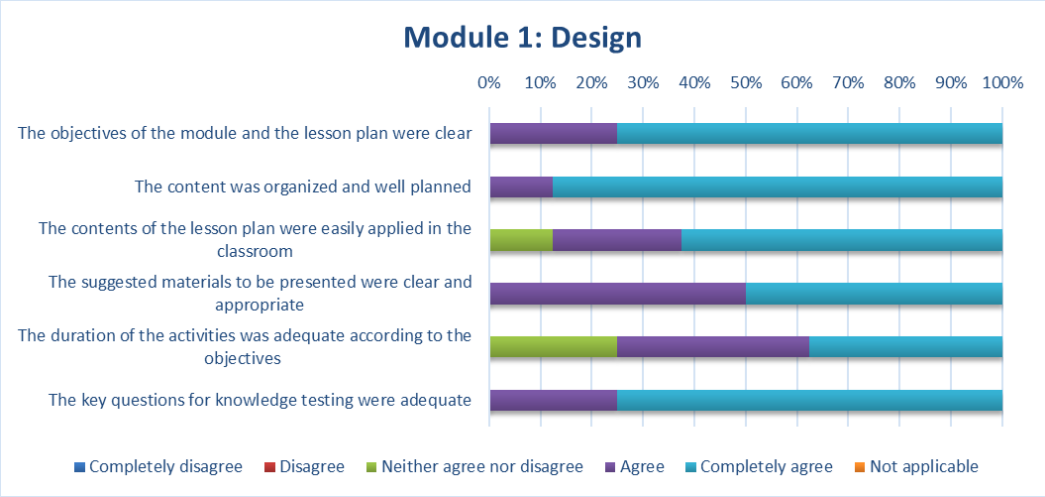


Regarding the adaptability of the activities to the target group, one teacher rated this sentence with "*completely disagree*" and 1 teacher with "*neither agree nor disagree*". However, more than half (62.5%) of the teachers (n = 6) considered that the proposed activities were adapted to the target group.

Regarding Modules assessment, teachers were also invited to rate some sentences related to each of the 4 modules: Design, Trademarks, Copyright and Patents.

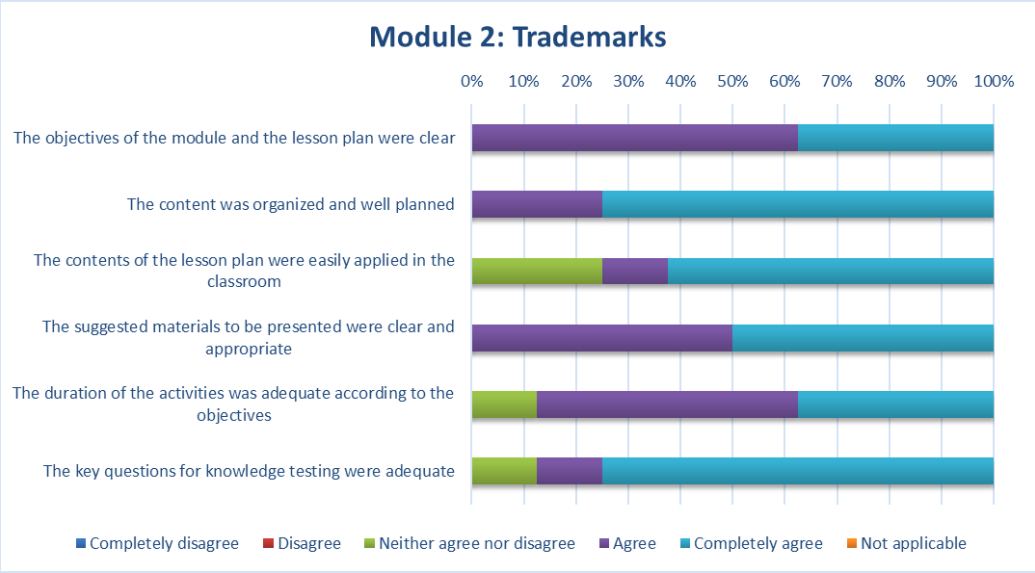
- **Module 1: Design**

The assessment of "Module 1: Design" was overall positive, with all the statements receiving more than 70% of positive feedback, as shown in the graphic below:



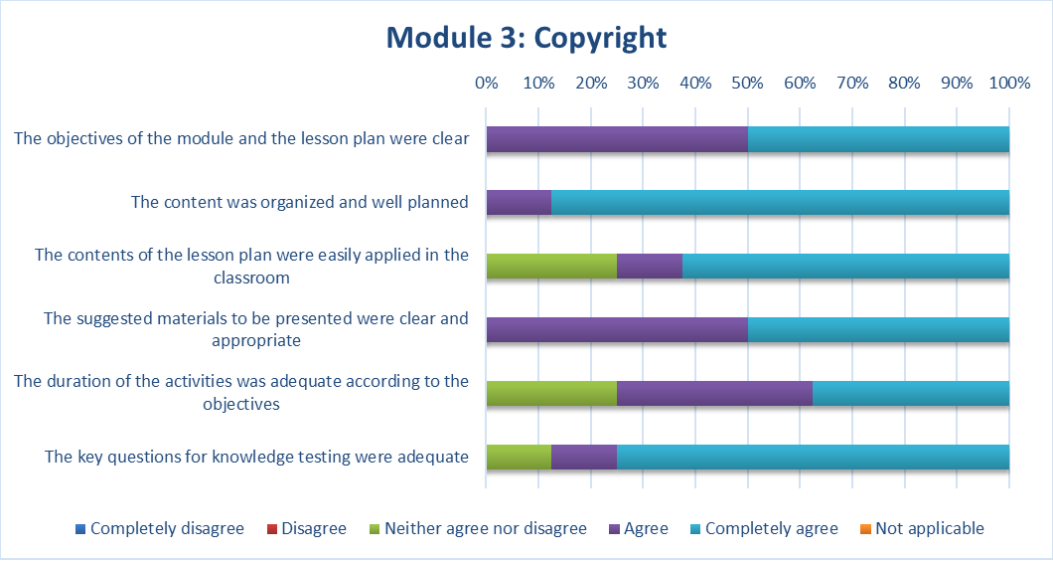
- **Module 2: Trademarks**

The assessment of "Module 2: Trademarks" was overall positive, with all the statements receiving more than 70% of positive feedback, as shown in the graphic below:



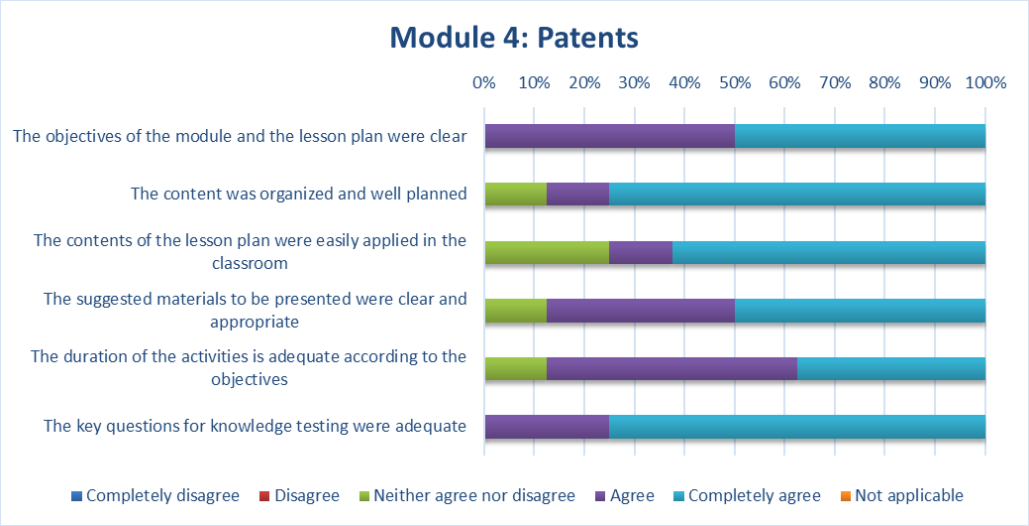
- **Module 3: Copyright**

The assessment of “Module 3: Copyright” was overall positive, with all the statements receiving more than 70% of positive feedback, as shown in the graphic below:



- **Module 4: Patents**

The assessment of “Module 4: Patents” was overall positive, with all the statements receiving more than 70% of positive feedback, as shown in the graphic below:

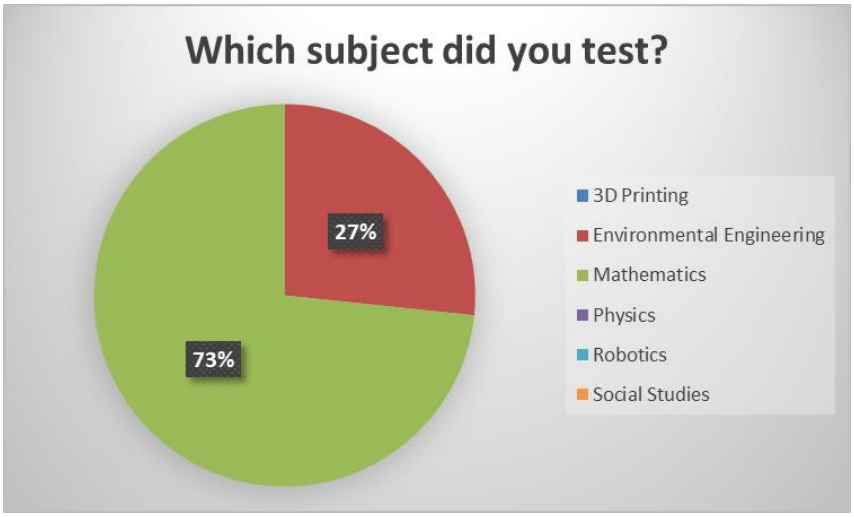


Based on the results retrieved from the answers of the teachers regarding both the general assessment of the training course and the assessment of the modules it is possible to conclude that the training course is clear, organized, appropriate and presents an overall high quality.

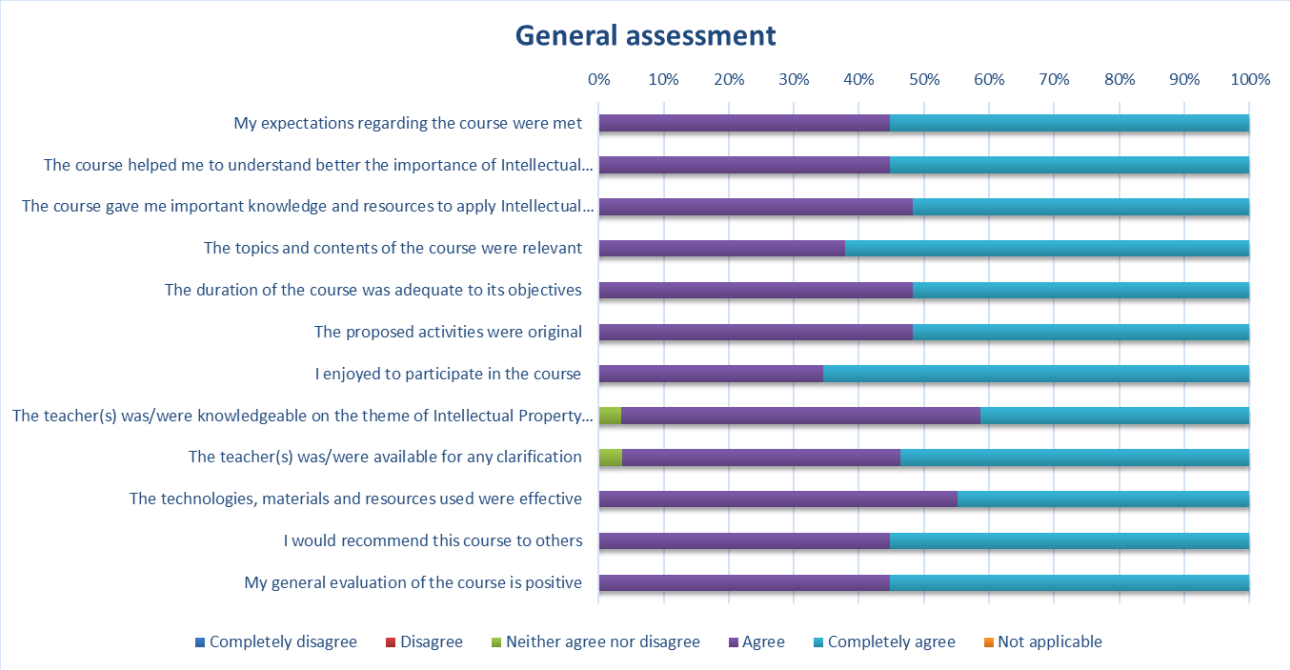
When asked for additional comments, only two teachers answered, with "*Congratulations*" and "I highlight the innovation, organization, dynamism and differentiating spirit of this course", which also reinforces the good overview regarding the training course.

3.1.2 Questionnaire for students: results and analysis

Each student tested one subject, with Mathematics and Environmental Engineering being tested, as shown in the graphic below:



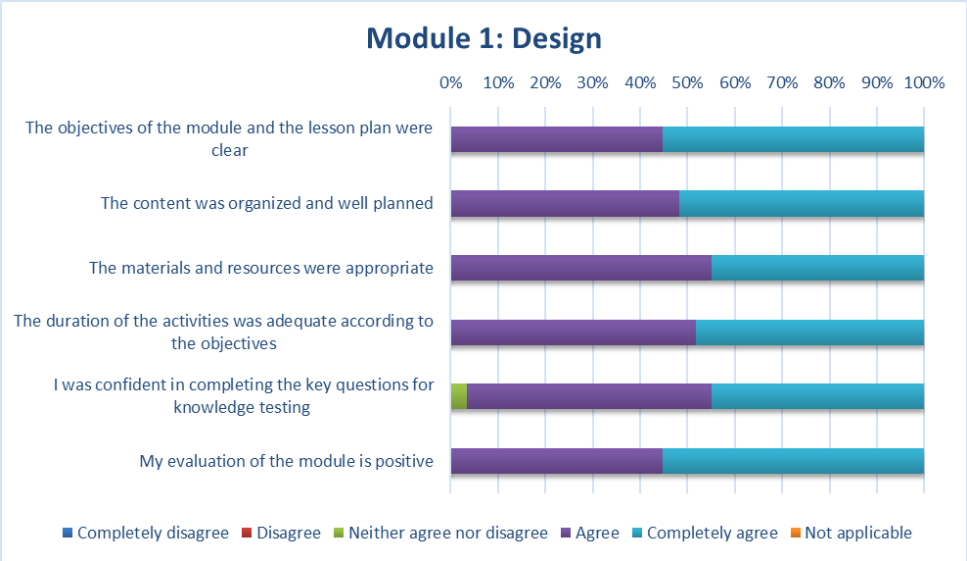
Regarding the general assessment of the training course, the results showed positive feedback from the students. All the statements were rated by more than 90% of the students with "*agree*" or "*completely agree*", as shown in the graphic below:



Regarding the assessment of the Modules, the students were also invited to rate some sentences related to each of the 4 modules: Design, Trademarks, Copyright and Patents.

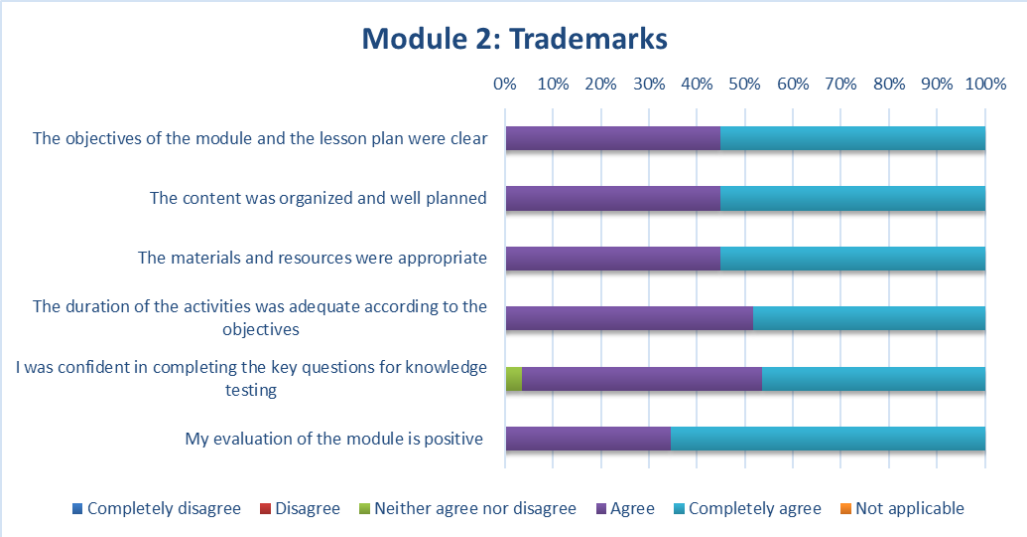
- **Module 1: Design**

The assessment of "Module 1: Design" was overall positive, with almost all the statements receiving 100% of positive feedback, as shown in the graphic below:



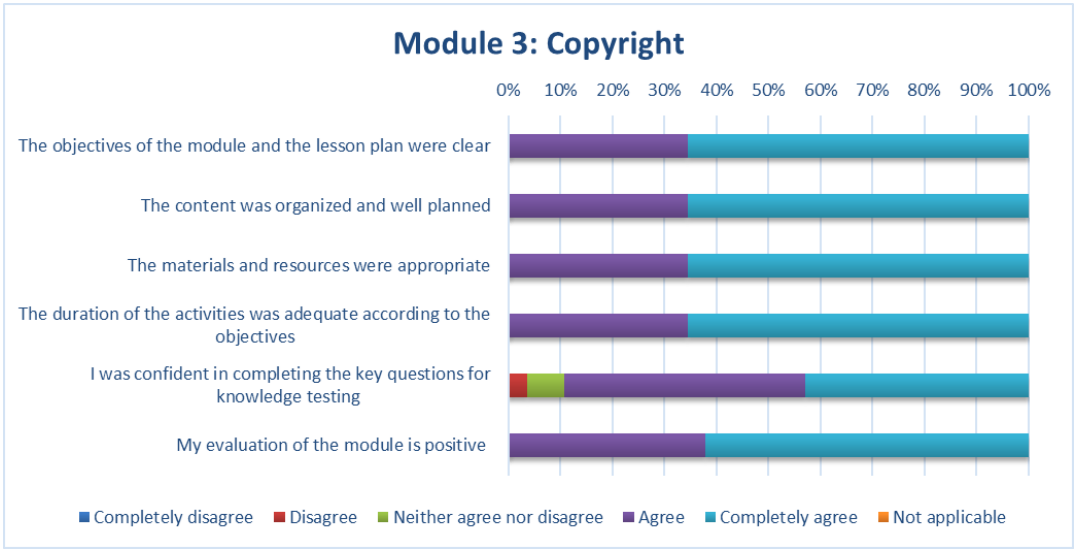
- **Module 2: Trademarks**

The assessment of “Module 2: Trademarks” was overall positive, with almost all the statements receiving 100% of positive feedback, as shown in the graphic below:



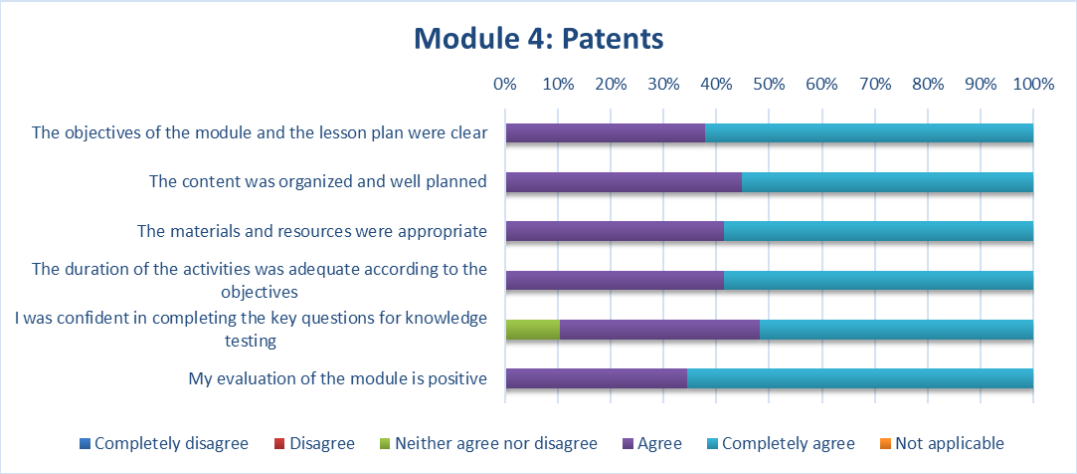
- **Module 3: Copyright**

The assessment of “Module 3: Copyright” was overall positive, with almost all the statements receiving 100% of positive feedback, as shown in the graphic below:



- **Module 4: Patents**

The assessment of “Module 4: Patents” was overall positive, with almost all the statements receiving 100% of positive feedback, as shown in the graphic below:



Based on the results retrieved from the answers of the students regarding the geral assessment of the training course and the assessment of the modules, it is possible to conclude that the students enjoyed performing the lesson plans and that the training course is clear, organized, and appropriate and presents an overall high quality. In fact, in all the 4 Modules, the only statement that did not receive 100% of positive feedback was regarding the students’ confidence in completing the key questions for knowledge testing.

When asked for additional comments, most of the students provided their feedback, referring that it was funny, interesting, and innovative and that they liked to perform it. Students also highlighted that they learned new and different issues and that they were afraid of not being able to respond to the key questions.

In sum, for the validation exercises of the first Intellectual Output of the IPinSTEAM project: the IPinSTEAM training course, INOVA+ collected, in Portugal, the feedback of 37 participants (8 teachers and 29 students) from the target group. The target was to engage 25 participants (20 teachers and 5 students) to validate the project outcomes, INOVA+ reached 37 participants, comprised of 8 teachers and 29 students, despite all the dissemination efforts. However, it is important to notice that most teachers tested and provided their feedback for more than one STEAM subject, which allowed to cover all the subjects of the training course.

The overall feedback was positive both from the teachers and from the students, which suggests that the training course presents good quality and may be used further in the school context to raise awareness about relevant concepts on IP and to empower teachers to integrate them into STEAM teaching. As an improvement note, it is important to refer that although most of the teachers rated positively the adaptability of the activities to the target group, a small percentage of teachers rated this

point less favourably, which suggests that some activities would perhaps benefit from being adapted to the school year and the context when implemented in order to achieve a higher impact.

The positive feedback presented by the teachers and the students in the Portuguese school context is a very important finding for validating the first Intellectual Output of the project: the IPinSTEAM Training Course.

4. References

Please use APA Style to write down your references.