STEAM Stars

2019-1-UK01-KA201-061537

Intellectual Output 4. Activity 6

Evaluation report of the PILOT phase

Contents

Introduction

The main objective of the pilot phase of the STEAM Stars project was to test and evaluate the project outputs in a real context with the target users. During the piloting phase, school teachers, trainers and non-formal and informal educators from Netherland, Spain, Turkey and United Kingdom carried out and assessed the STEAM Stars Open Campus and the STEAM Stars Assessment App.

This evaluation report collects the feedback acquired via an online questionnaire from **15 school teachers, trainers and non-formal and informal educators** from those countries taking part in the pilot phase, from September to November 2022.

The analysis of the results of the pilot phase have supported the development of the final version of the STEAM Stars materials as well as recommendations for further dissemination and exploitation activities.

Results are presented by question, including encouraging comments and development ideas provided in answer to the open questions.

Description of the pilot phase

FOUR PILOT COUNTRIES:

The Netherlands, Spain, Turkey and United Kingdom

DURATION:

1-3 months (from 1 September to 30 November 2022)

TARGET USERS:

- *Description:* school teachers, trainers and non-formal and informal educators
- *Role:* Testing and evaluating the STEAM Stars Open Campus and the STEAM Stars Assessment App.

OBJECTIVES OF THE PILOT PHASE:

1. Identify the factors affecting user **satisfaction** in the STEAM Stars Open Campus and STEAM Stars Assessment App that influence the effectiveness of course delivery.
2. Evaluate the **effectiveness** of the STEAM Stars Open Campus and STEAM Stars Assessment App through users' evaluations of their own learning.
3. Collect and analyse users' **feedback**.
4. Make **recommendations** for the final version of the STEAM Stars Open Campus and STEAM Stars Assessment App.

REQUIREMENTS OF TARGET USERS:

Target users (school teachers, trainers and non-formal and informal educators) from the piloting countries were asked to test the STEAM Stars Open Campus and the STEAM Stars Assessment App in the context of their educational activities and to evaluate their usability and effectiveness.

Target users were requested to conduct the **following specific tasks**:

o Complete a minimum of two Learning Units or six individual lessons.
o Apply that knowledge to their daily teaching activities. Each target user is asked to apply this knowledge with at least five students (being gifted or not).
o Reflect on the acquired knowledge and provide feedback on the outputs.

Results of the pilot phase

Target user information

The pilots were conducted by 15 target users (school teachers, trainers and non-formal and informal educators): five from Turkey, four from the United Kingdom, four from The Netherlands, and two from Spain. The majority of the respondents (11) are profiled as target users (school teachers, trainers and non-formal and informal educators), followed by collaborator/experts (2), 1 stakeholder (organisation at local/regional/national level or/and European Organisation) and 1 classified as "Other" (not defined). Furthermore, more than the half of respondents (8) work with the age group of Secondary level (12/13 – 16 years), followed by 40% at Primary level (<11/12 years), and 1 answer for Higher/third level (+18 years).
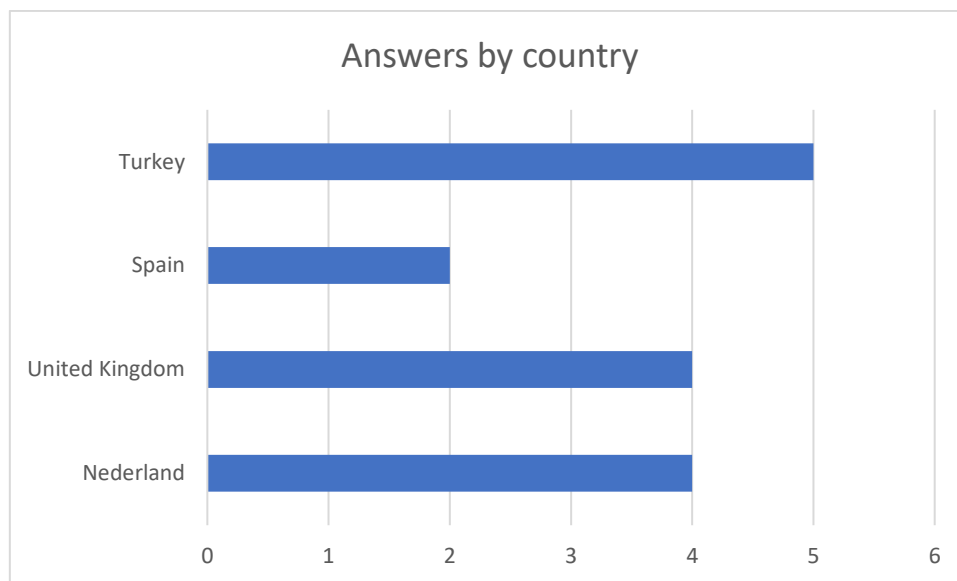
Figure 1 Answers by country
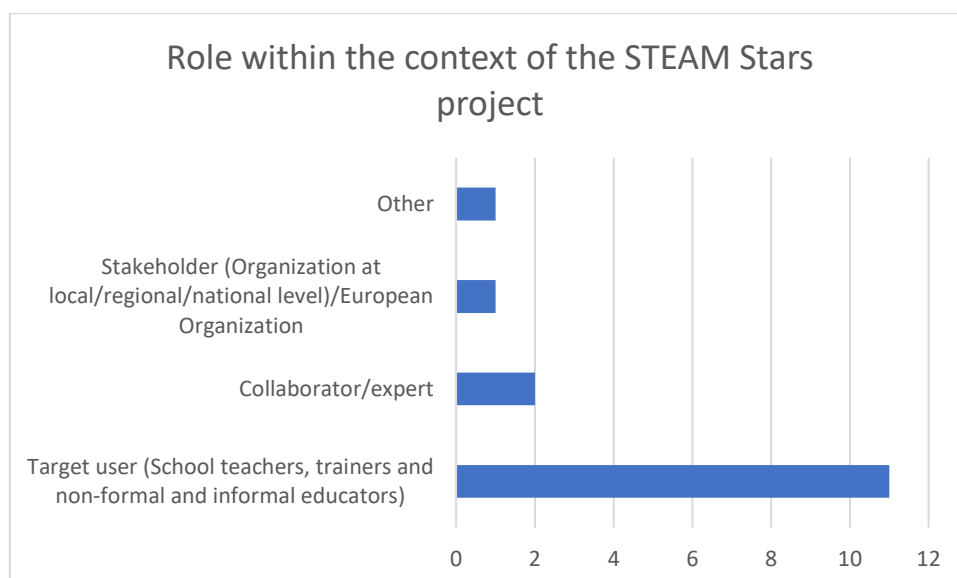
Figure 2 Role within STEAM Stars project context

Figure 3 Age group within STEAM Stars project

STEAM Stars Open Campus

STEAM Stars Open Campus objectives

Regarding the objectives of the STEAM Stars Open Campus, the expectations for student learning, the objectives for each MOOC course and the delivery of the course have been rated as quite clear, precise and consistent with an **average score of 3,96/5.**

Figure 4 STEAM Stars Open Campus objectives

STEAM Stars Open Campus content

Regarding the content of the STEAM Stars Open Campus, the course modules, the instructional materials, the content, and the structure have been rated as fairly innovative, contributory to one's learning, comprehensive and well structured, with an **average score of 3,88/5**.
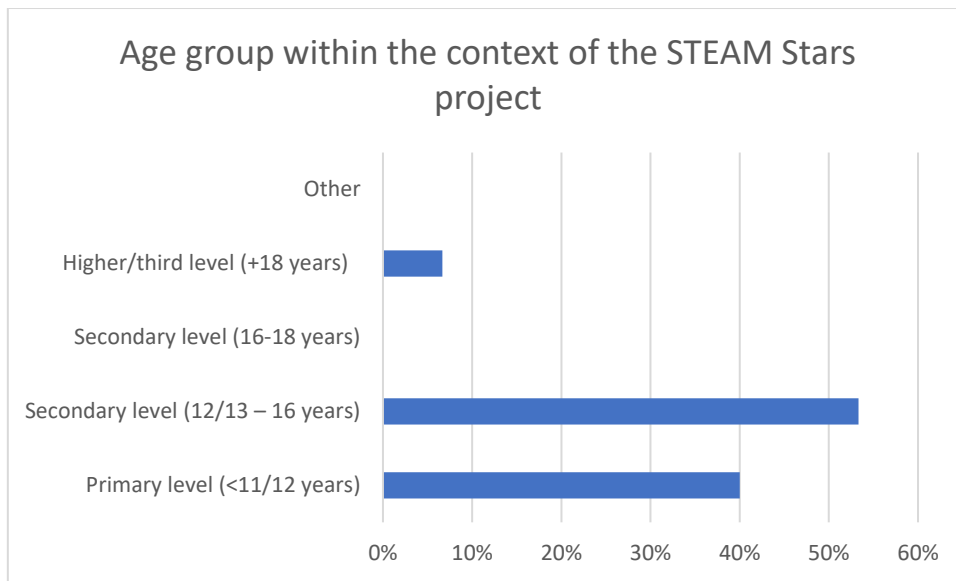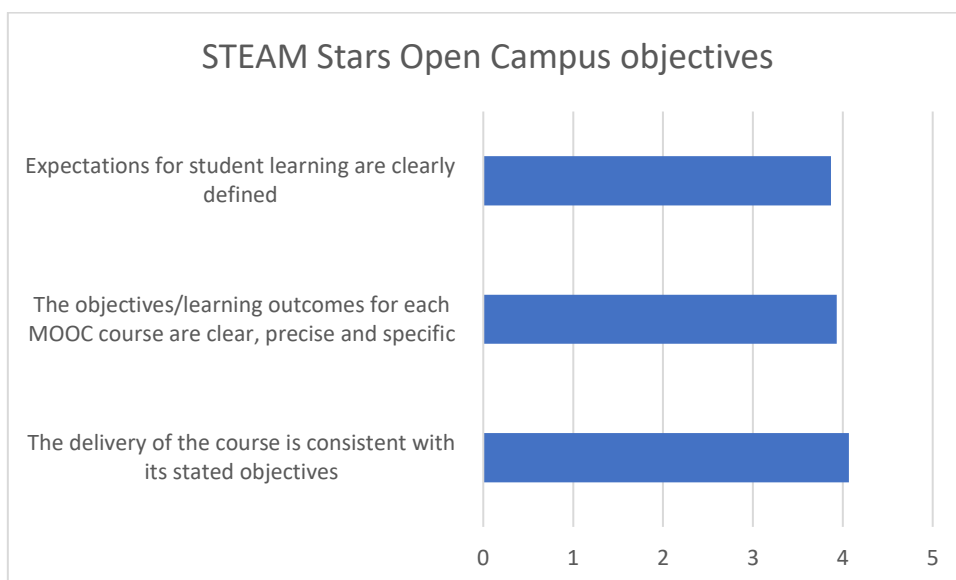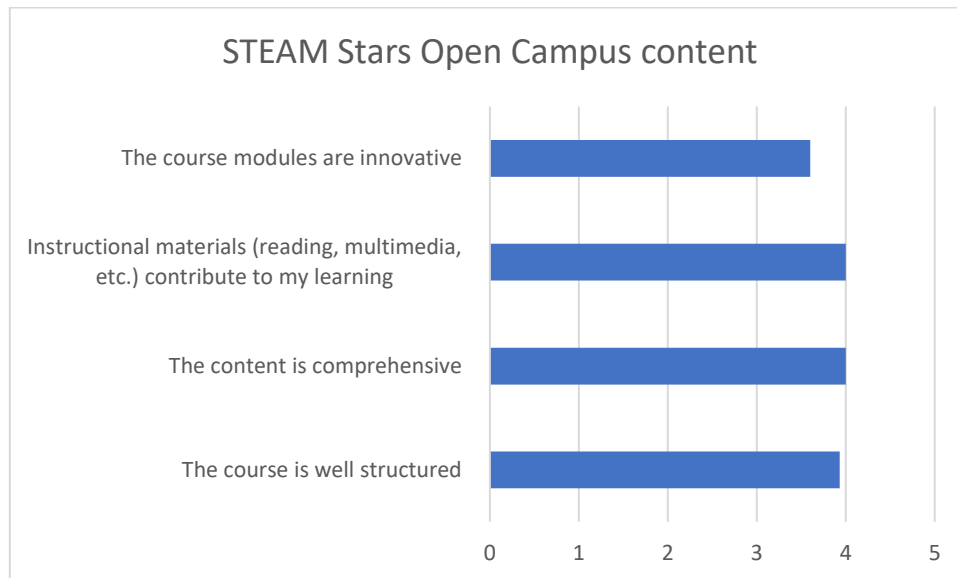

Figure 5 STEAM Stars Open Campus content

Feedback on the Open Campus content for future development

Regarding **additional content** suggested by target users for the **Open Campus**, two users suggested further development regarding twice-gifted students and another two suggested increased content about math and engineering. Other suggestions involve tips for communicating the high capabilities diagnosis to the student's family/environment, how to turn a "normal" question into a gifted suitable question, as well as the well-being of gifted students and motivation of teachers, and theoretical perspectives of STEAM. One user mentioned the fact that some information is presented without detailing the source.

'Which topics do you wish were more in-depth?'

- *Twice exceptional students (UK)*
- *For me specifically the information on twice gifted students could be even more elaborate (UK)*
- *Once a student has been identified as highly capable at the center, then it comes a difficult part, which is communicating it to the student's family/environment. Some tips on this step could also be interesting (Spain)*
- *All (Netherlands)*
- *How to turn a "normal" question into a gifted suitable question (Netherlands)*
- *As an expert the depth is insufficient for me, but I think this is different for a lecturer. Especially if he has little experience with Highly Gifted students (Netherlands)*

STEAM Stars Open Campus usefulness

In Figure 6 the units and lessons taken by the target users are provided. As we can see, the selection of units and lessons among users have been fairly equitable, highlighting **Unit 1 Foundations of Gifted Education** and **Lesson 1.2 Definitions and Characteristics of Giftedness** as the preferred lessons, followed by **Unit 2 Educational Needs of Gifted Students** and **Lesson 2.3 The Educational Needs of Underachieving & Twice-Exceptional Gifted Students**.
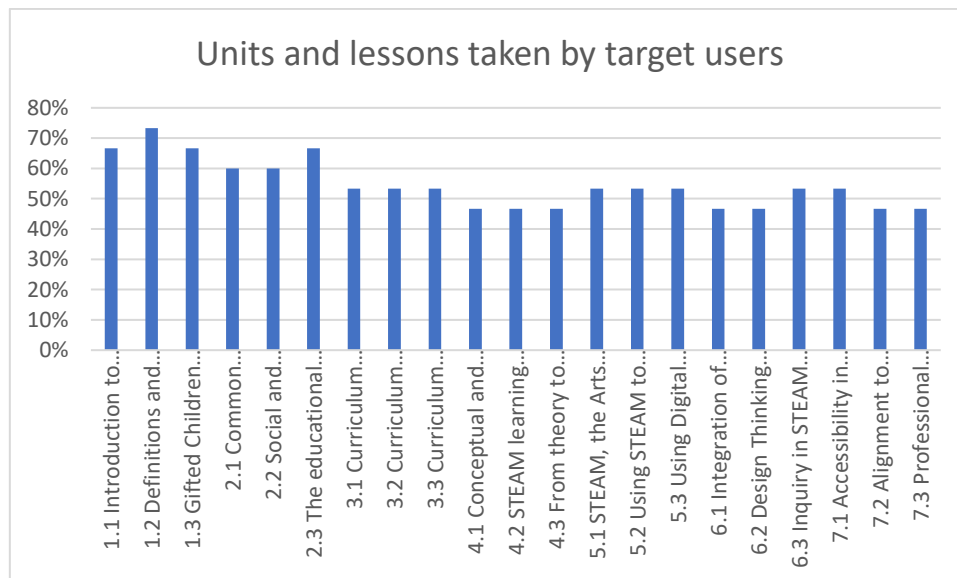
Figure 6 Units and lessons taken by target users

Regarding the **usefulness** of the STEAM Stars MOOCs, in general, **all the lessons were rated as very useful with scores above 4,1/5**. The most valued was **Unit 4 Learning Environments for Gifted Instruction** with scores between 4,7–4,9. **Unit 7 Implementation of STEAM Education for Gifted Students** and **Unit 6 Instructional Design of STEAM for Gifted Students** also received scores above 4,7 (except for lesson 6.3 Inquiry in STEAM Lesson Design which rated 4,4). The least valued Units were **Unit 3 Curriculum Planning for Gifted Students** and **Unit 5 Teaching Basic Skills to Gifted Students Through STEAM Education**, with scores between 4.1 and 4.3.
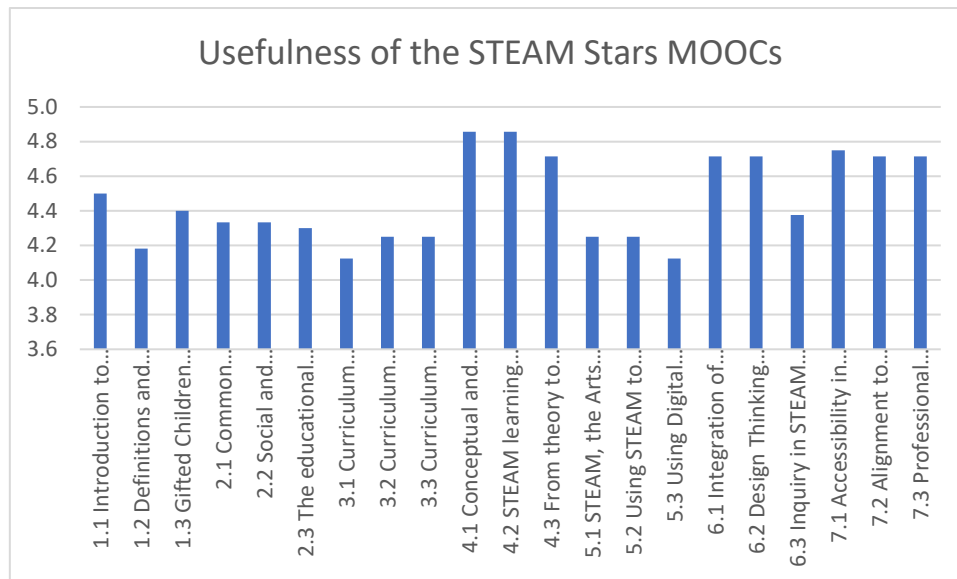
Figure 7 Usefulness of the STEAM Stars MOOCs

Additional comments on the content and usefulness of the MOOCs

Regarding the usefulness of the Open Campus, the positive and encouraging comments about the usability of the Open Campus stand out. However, there are also some tips for improvement such as the comment about the large amount of material for the subject, the style of some videos, and finally some specific comments about errors and suggesting corrections for some assessment questions.

'Please add any additional comments regarding the USEFULNESS'

- *Very interesting (Spain).*
- *I understand that you want to materials to be complete, and not skip anything, but the amount of reading needed to get started on (for example) educational materials for gifted kids is humungous. I presume that if anyone wants to write learning materials for gifted children, they would have done so in the past, and just a few tips would be enough to improve their game (Netherlands).*
- *Some videos are very American ;-) (Netherlands).*
- *The remarks correspond to the remarks mentioned in 6. In unit 5 there are regular typing errors in the text. the 'tests' that can be filled in repeatedly ensure that I go faster through the text and start gambling. I don't know if more people have the same... In the 3rd module at unit 5 there is a question in which a choice can be made from different answers, including answers '1 and 2'. Because the answers change places in the questions, this does not quite refer to the possible answers (they can then, for example, also be in position 1 and 3 (Netherlands).*
- *Gifted education (Turkey).*
- *Invaluable for gifted students (Turkey).*
- *This is very useful educational tool especially for gifted education because the teaching process focuses on high order thinking skills that needs to be considered during gifted education (Turkey).*

STEAM Stars Open Campus usability

Regarding the **usability** of the STEAM Stars Open Campus, the multimedia elements, the level of comfort, the intuitiveness, the support needed to use the platform, and the ease of learning to use the platform were rated as rather clear, comfortable, intuitive, and easy to use with an **average score of 4,07**. The question regarding extra support needed to use the platform was scored the lowest with 3,07; in other words, although some support was required it was relatively limited.
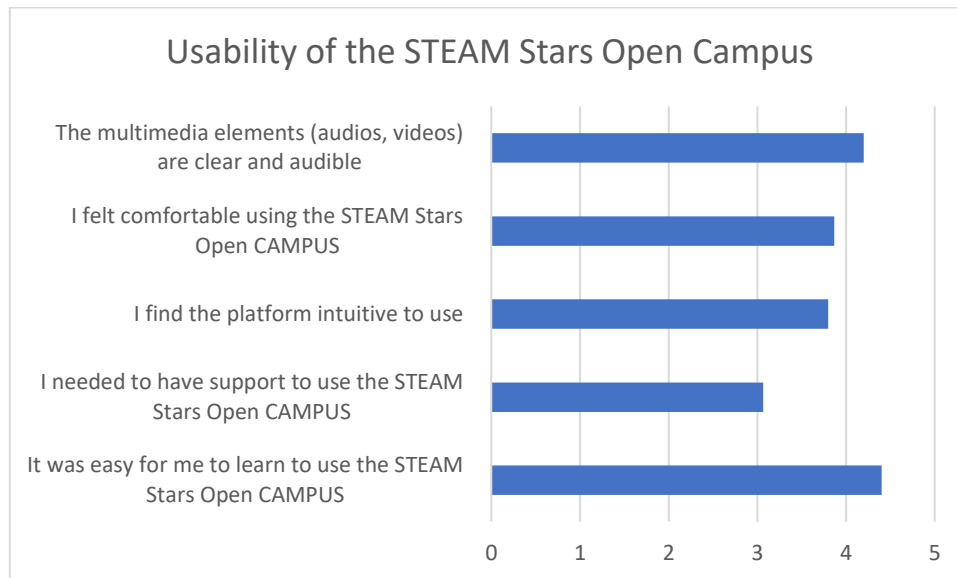
Figure 8 Usability of the STEAM Stars Open Campus

Additional comments regarding the USABILITY of the STEAM Stars Open Campus

We also received positive and encouraging comments about the usability of the Open Campus. Suggestions for improvement include the jargon used in the assessment sections, and two specific comments about difficulties when logging in and creating an account.

'*Please add any additional comments regarding the* USABILITY'

- *I had issues logging in as the system was not sending me a confirmation email allowing me to create a login in the first instance. I could not reset my password either. I tried with several different emails and eventually was sent a password to use. This works but the system will not allow me to change this password. I tried but the new password doesn't work when I try to login (UK).*
- *The assessment uses specific jargon that was not previously explained, therefor making me rate myself lower as I didn't understand the specific jargon (UK).*
- *The first time I tried to create an account did not work, fortunately it worked with a different email address (Netherlands).*
- *I think the process is fluid (Turkey).*
- *I think the transitions are understandable (Turkey).*
- *It is easy to implement during teaching process (Turkey).*

STEAM Stars Open Campus pedagogical methodology

Regarding the **pedagogical methodology** of the STEAM Stars Open Campus, the seven questions regarding the assessment, learning methods, tutoring and guidance, and the learning process resulted in answers evaluating the materials as useful, continuous, innovative, suitable for gifted students and for target users, well planned, and easy to follow with an **average rate of 3,97/5**.
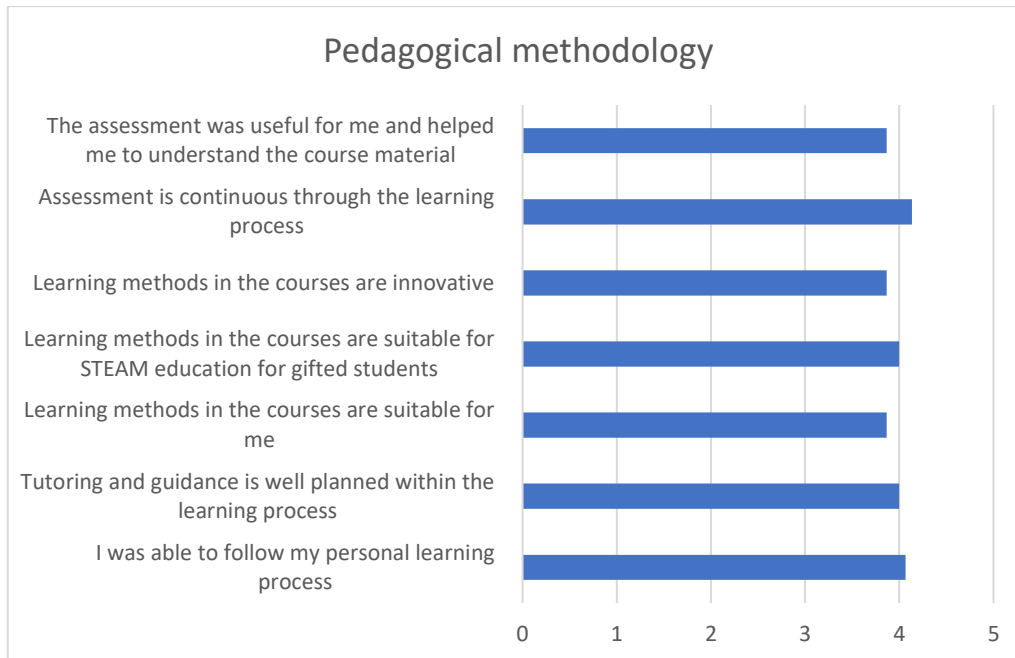
Figure 9 Pedagogical Methodology

Additional comments regarding the pedagogical methodology of the STEAM Stars Open Campus

Regarding the Pedagogical methodology of the Open Campus, there were three positive comments and one comment for improvement, related to the order in which to follow the material and the time needed to complete the courses.

'*Please add any additional comments regarding the PEDAGOGICAL METHODOLOGY*':

- *I am unclear how to use the teaching and training materials - which order to use them and how. The suggested teaching/learning timings on the training modules seem to be way too long. The first module of section 1 suggests 10 weeks. A suggested number of hours would be more helpful (UK).*
- *As long as control (Turkey).*
- *Contributes to the monitoring of pedagogical development (Turkey).*
- *Under Instruction and assessment approaches is very useful and suitable for STEAM education for glared students (Turkey).*

Guidance during the piloting of the STEAM Stars Open Campus

Regarding the guidance during the piloting of the STEAM Stars Open Campus, the technical guidance, the guidance and support from STEAM Stars representatives, and the instructions for using the Open Campus were rated as relevant, useful, enough, and clear with an **average score of 3,98/5.**
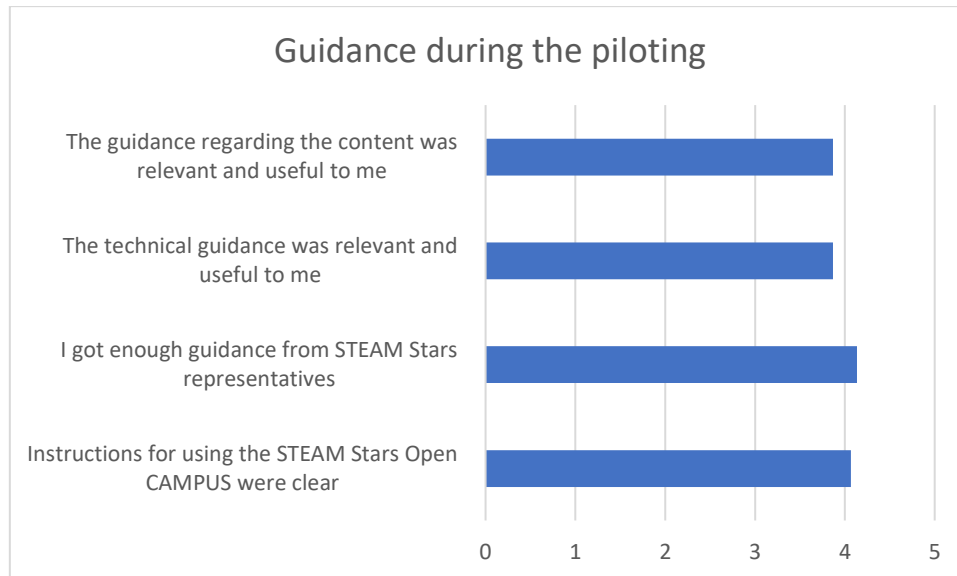
Figure 10 Guidance during the piloting

Additional comments regarding the guidance during the piloting phase

Regarding the guidance during the piloting phase, three positive comments and two additional comments about the difficulty in following the instructions were received.

'Please add any additional comments regarding the GUIDANCE during the piloting phase':

- *It was not clear where to start (UK).*
- *The instructions send did not always work. On top of that a lot of jargon was used and not explained therefor leaving me feeling like I had to rate myself lower than maybe my knowledge is (UK).*
- *It enables an effective observation process (Turkey).*
- *Enables active participation (Turkey).*
- *Guidance is so efficient (Turkey).*

Overall rating of the STEAM Stars Open Campus

Regarding the overall rating of the STEAM Stars Open Campus, pilots were asked questions about whether they would recommend the training to fellow teachers, the application of the topics learned, the achievement of the outcomes, the usefulness of the course as teachers of gifted students, the educational impact, and the fulfilment of the expectations. The responses were positive, with the materials rated as highly recommendable, applicable, with achievable outcomes, useful for gifted students and teachers, with high educational impact and fulfilling one's expectations, with an **average rate of 3,9/5.**
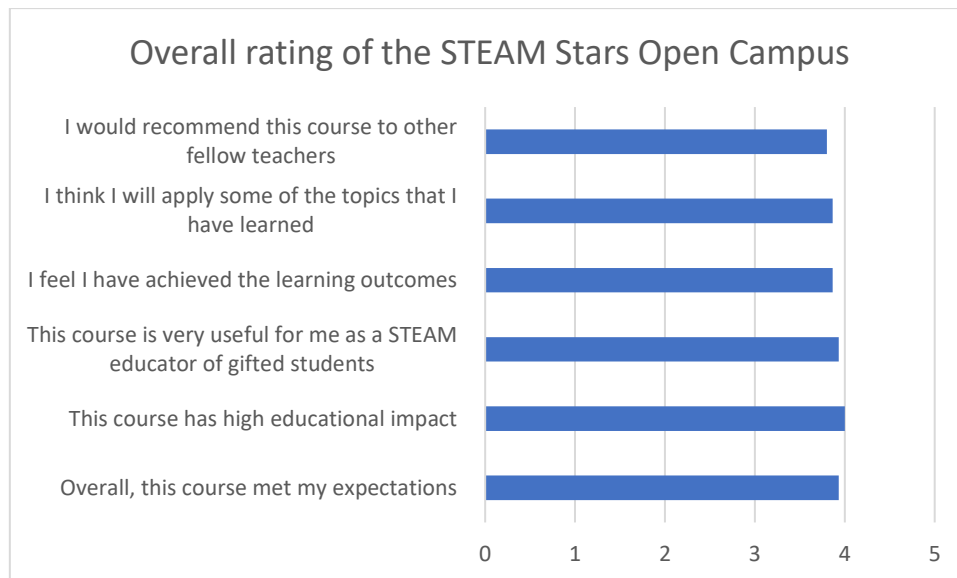

Figure 11 Overall rating of the STEAM Stars Open Campus

Open ended questions about the STEAM Stars Open Campus

How do the learning methods of the STEAM Stars Open Campus fit your school's education methodology?

- *We want to challenge all types of pupils with an integrated curriculum (UK).*
- *There are some very interesting ideas. It is useful to have this knowledge when teaching a broad spectrum of abilities. However, some suggestions about changing the curriculum will not be practical. Major changes to the curriculum take careful planning and so we might be able to implement some ideas. Perhaps it would work as extra-curricular enrichment (UK).*
- *Our school focuses on individual students and their needs. All work is individually tailored to students' needs (UK).*
- *I have not completed enough learning to know this yet (UK).*
- *When addressing these situations in a collaborative way between different people from the center, such as teachers, psychologists, head of studies, etc., the use of the web will be proposed for teachers who may find themselves in this situation (Spain).*
- *The STEAM methodology (the same with STEM) is voluntary in some specific cases of subjects, since it is not part of the study plan (Spain).*
- *I can hand them out, see if my colleagues do something with them (Netherlands).*
- *Does not apply to me (Netherlands).*
- *Not (Netherlands).*

- *Fits well (Turkey).*
- *Project-based training (Turkey).*
- *It offers a comprehensive overview of gifted students (Turkey).*
- *It is very beneficial for distance education and also hybrid education (Turkey).*
- *It can be applied to gifted students in my school (Turkey).*

What did you like the most about the STEAM Stars Open Campus?

- *Mix of prose and videos with extra links if you want to follow them up (UK).*
- *Some very interesting ideas especially around the twice exceptional students (UK).*
- *I was able to improve my teaching skills. Being able to access the courses whenever I had free time was invaluable (UK).*
- *The availability of resources to use with students (UK).*
- *Visually easy, attractive and brief. Appropriate for teachers (Spain).*
- *The fact that the courses are divided into many parts with specific topics (Spain).*
- *Creative (Netherlands).*
- *Variation in assignments (Netherlands).*
- *It is accessible (Netherlands).*
- *Overall (Turkey).*
- *It was very effective in increasing productivity and advancing the process with real life drums (Turkey).*
- *It offers an opportunity for each participant to find something for himself (Turkey).*
- *Usefulness for creating more Steam activities (Turkey).*
- *I like interesting teaching methods (Turkey).*

What would you improve or develop further in the STEAM Stars Open Campus?

- *Nothing (UK).*
- *Perhaps to allow for discussion time (UK).*
- *So far only the points already raised (UK).*
- *Using less jargon specific to giftedness (UK).*
- *Positive feedback (Spain).*
- *I don't know (Spain).*
- *I do not know. shorter? (Netherlands).*
- *I would like it if videos were developed themselves (Netherlands).*
- *In terms of content, I think it could be stronger. I now randomly started somewhere and also dropped out at a certain moment because I found it difficult to determine the value of the information due to the lack of sources in the text. I also found it difficult to find the cohesion in the whole, everything seemed to be more separate from each other. Maybe making it work more controlled by the whole thing will help in this? Perhaps I also have 'too much' knowledge, which means that I have a different need than students without knowledge (for example, I would like much more comparison between different methods/visions, etc.) (Netherlands).*
- *Wide implementation (Turkey).*
- *Guidance (Turkey).*
- *I would improve its scope (Turkey).*

- *More activity examples (Turkey).*
- *I will identify the deficiencies by applying it to my own students at my school. In this direction, I will contribute to the development (Turkey).*

STEAM Stars Assessment App

Assessment App objectives

Concerning the objectives of the Assessment App, the objectives of each assessment unit, the delivery of the self-assessment app, and the main objective of the self-assessment tool were valued as highly clear, precise, specific, and consistent with an **average score of 3,96/5.**

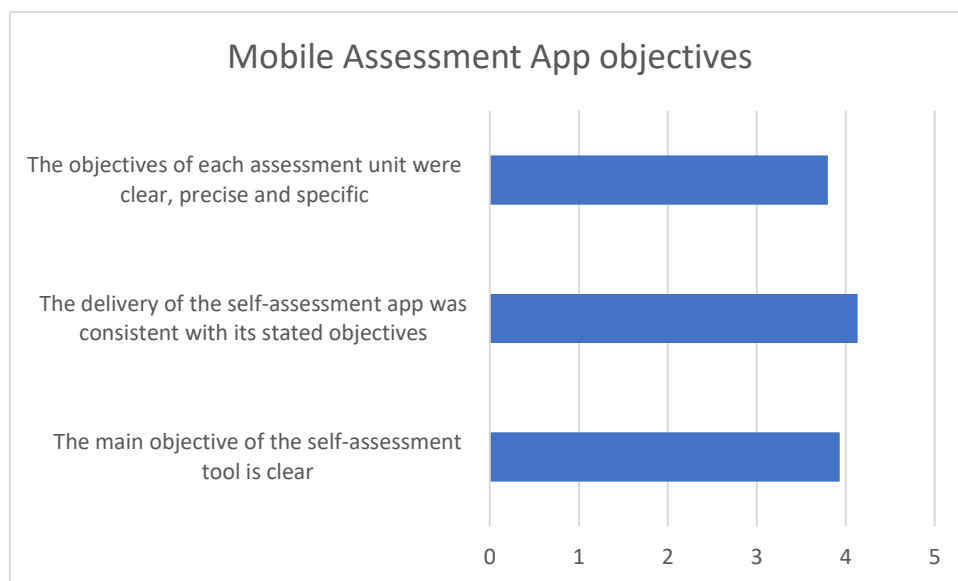*Figure 12 Assessment App objectives*

Assessment App content

Regarding the content of the STEAM Stars Assessment App, the questions regarding the app content and methodology, and the instructional materials, resulted in answers evaluating the web app as being quite innovative, adequate, contributory to one's self-assessment, comprehensive and well-structured with an **average score of 4/5.**
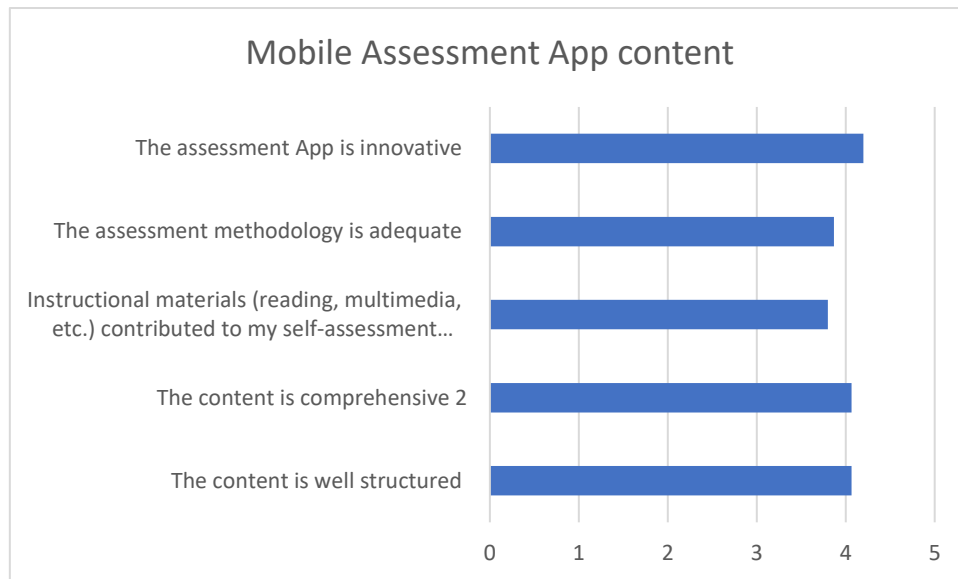
Mobile Assessment App content

Statement	Value
The assessment App is innovative	~4.2
The assessment methodology is adequate	~3.9
Instructional materials (reading, multimedia, etc.) contributed to my self-assessment…	~3.8
The content is comprehensive 2	~4.1
The content is well structured	~4.1

Figure 13 Assessment App content

Additional comments regarding the CONTENT of the STEAM Stars Assessment App

Regarding **additional content** suggested by target users for the ***Assessment App***, three users provided positive comments about the app. However, there were also suggestions for improvement related to the language of the assessment app, which some users considered too difficult and academic and related to the content overview in the whole. There is also a comment requesting guidance on how to get the app and use it (the use of a web-based app for the assessment rather than a mobile app led to this confusion; several users reported that they had expected a mobile app to be available in addition to the webapp).

'*Please add any additional comments regarding the CONTENT of the STEAM Stars Assessment App'*:

- *The statements were too academic and not helpful to me when trying to decide if a statement applied to my current practice and understanding. Statements of actions and examples of things I might see/experience/do in my practice would have made it easier to self-assess (UK).*
- *How is the mobile assessment app different from the website? And if it is an actual app in the app store, please provide guidance on how to get it and use it? (UK).*
- *Even more overview in the whole is desirable. For example, also in which courses have already been completed.*
- *It was an enjoyable process (Turkey).*
- *It was an enjoyable process (Turkey).*
- *Content of this is so comprehensive and it makes you feel more comfortable (Turkey).*

Assessment App usability

Regarding the **usability** of the STEAM Stars Assessment App, the multimedia elements, the comfortability, the intuitive use, the needed support to use the app, and the ease of learning to use the app were rated as highly clear, comfortable, intuitive, and easy to use with an **average score of 4,13**. The question regarding extra support to use the app was scored the lowest with 3,4.
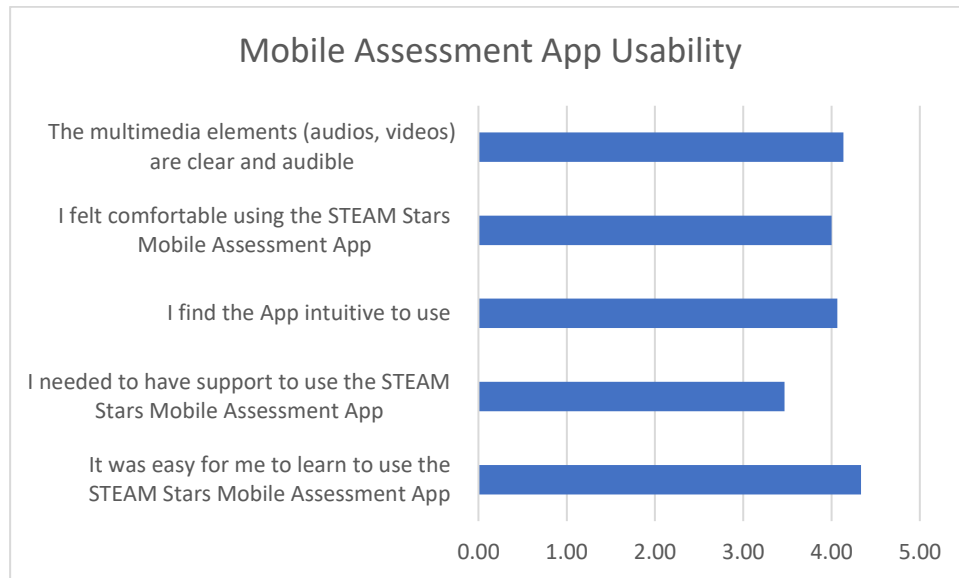

Figure 14 Assessment App Usability

Additional comments regarding the USABILITY of the STEAM Stars Assessment App

Regarding additional comments on the usability of the Assessment App, the three comments collected were very positive about the intuitive process, accessibility, and usefulness of the webapp.

'Please add any additional comments regarding the USABILITY *of the STEAM Stars Assessment App'*:

- *Besides an intuitive process, it was very accessible (Turkey).*
- *Besides an intuitive process, it was very useful (Turkey).*
- *It is too easy for understanding and using (Turkey).*

Guidance during the piloting of the STEAM Stars Assessment App

Regarding the guidance during the piloting of the STEAM Stars Assessment App, the technical guidance, the guidance and support from STEAM Stars representatives, and the instructions for using the Assessment App were rated as quite relevant, useful, enough, and clear with an **average rate of 4,13/5.**
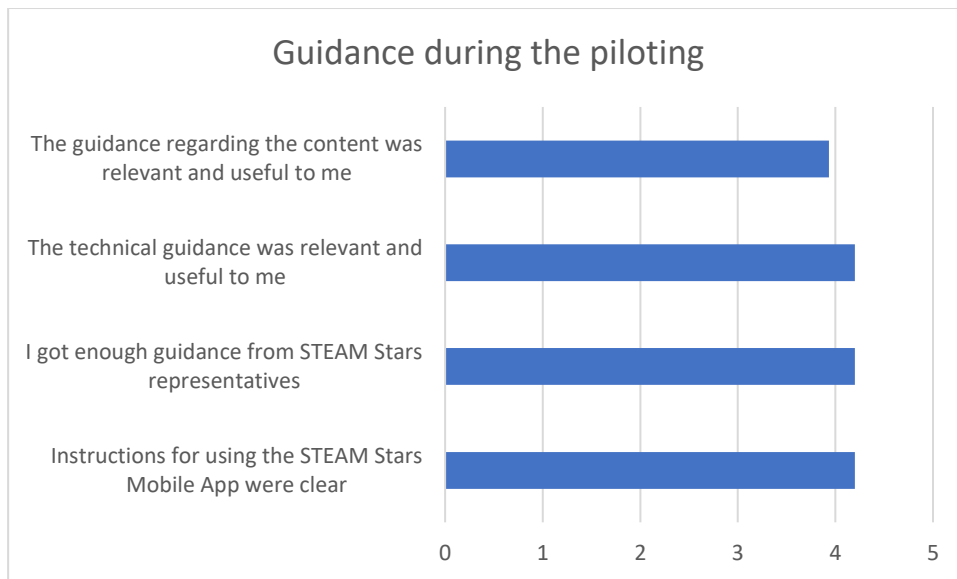
Figure 15 Guidance during the piloting

Additional comments regarding the guidance during the piloting phase

Regarding additional comments on the guidance during the piloting phase, most comments valued it very positively. Another comment requesting guidance on how to get the app and use it was collected.

'Please add any additional comments regarding the guidance during the piloting phase':

- *How is the mobile assessment app different from the website? And if it is an actual app in the app store, please provide guidance on how to get it and use IT? (UK).*
- *I was helped well and quickly on my way when this was necessary to use the app (Netherlands).*
- *It was useful for me (Turkey).*
- *It was useful for me (Turkey).*
- *It is very clear (Turkey).*

Overall rating of the STEAM Stars Assessment App

Regarding the overall rating of the STEAM Stars Assessment App, the five questions concerning the overall rating of the Assessment App were answered very positively (**average score of 3,75**) in terms of the usefulness of the assessment and the feedback obtained through the app, its educational impact, and the fulfilment of the pilots' expectations.
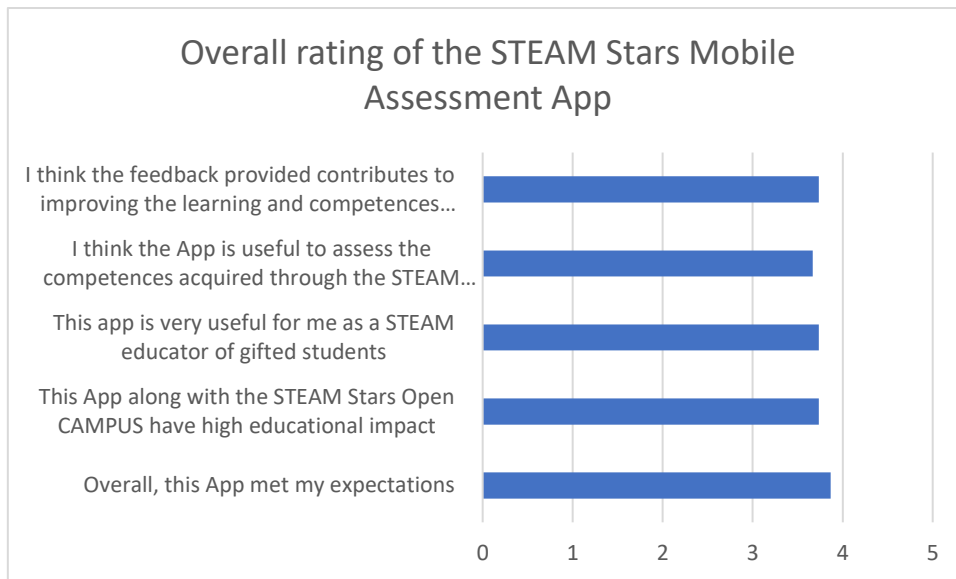
Overall rating of the STEAM Stars Mobile Assessment App

I think the feedback provided contributes to improving the learning and competences…

I think the App is useful to assess the competences acquired through the STEAM…

This app is very useful for me as a STEAM educator of gifted students

This App along with the STEAM Stars Open CAMPUS have high educational impact

Overall, this App met my expectations

Figure 16 Overall rating of the STEAM Stars Assessment App

Open ended questions about the STEAM Stars Assessment App

What did you like the most about the Mobile App?

- *[Ease] of use (UK)*
- *Easy to use (UK)*
- *not much (UK)*
- *How is the mobile assessment app different from the website? And if it is an actual app in the app store, please provide guidance on how to get it and use IT? (UK)*
- *Innovative and easy to use (Spain)*
- *The fact that it offers different solutions to continue improving (Spain)*
- *Creative (Netherlands)*
- *variety of assignments (Netherlands)*
- *It is low threshold (Netherlands)*
- *I loved its content and approach (Turkey)*
- *I loved its content and approach (Turkey)*
- *Feedback (Turkey)*
- *I like that it is multifunctional and useful (Turkey)*

What would you improve or develop further in the STEAM STARS Mobile App?

- *Nothing (UK)*
- *Need more time to consider this (UK)*
- *Positive feedback (Spain)*
- *I don't know (Spain)*
- *I do not know (Netherlands)*
- *Nothing (Netherlands)*
- *Improving the overview, maybe the possibility to share content with other teachers who participate (Netherlands)*

- *I could have done more comprehensively (Turkey)*
- *Including more competencies (Turkey)*
- *I think the mobile app is sufficient (Turkey)*

Have you applied the learning material in your classroom?

The only 'No' answer corresponds to a target user from the Netherlands who then clarifies that he/she has not applied the learning material because he/she doesn't have a class in which to implement it.
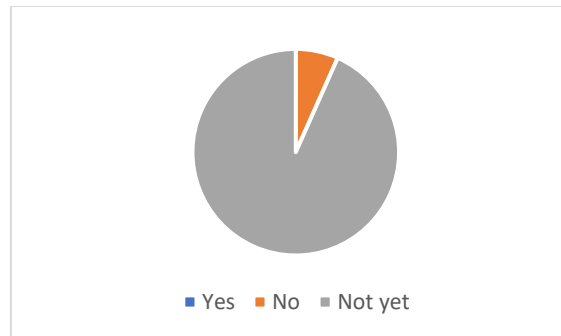

Figure 17 Have you applied the learning material in your classroom?

At the time of the pilot users' completion of the questionnaires, they had not had the opportunity to apply their knowledge in the classroom. Since the questionnaires were submitted, however, we have received feedback from several teachers in the UK and the Netherlands to say that they have used their learning in their classrooms. The units which had been of use to teachers varied; however, Units 1 and 2 were cited as being helpful for understanding aspects of giftedness and twice-exceptionalism which the educators had not been aware of. Additionally, Unit 4 was of use as an introduction to the design of inclusive learning environments which can support and challenge gifted pupils.

Conclusions

This evaluation collates the feedback received from target users from the UK, Netherlands, Spain and Turkey via an online questionnaire, from September to November 2022. The results, conclusions and recommendations obtained support the development of the final version of the STEAM Stars materials as well as the dissemination and exploitation activities of the project.

From the **15 responses received, five were from Turkey, four from the UK, four from The Netherlands, and two from Spain**. The most common user profile was **school teacher/trainer/non-formal and informal educator** working with the student-age group of **Secondary level** (12/13-16 years).

Although the **selection of pilot units and lessons** among target users was quite equitable, the most preferred units were Unit 1: Foundations of Gifted Education, followed by Unit 2: Educational Needs of Gifted Students.

Regarding the **usefulness of the STEAM Stars MOOCs**, all the lessons were rated as very useful with scores above 4,1. The most valued was Unit 4: Learning Environments for Gifted Instruction with scores between 4,7-4,9. Unit 7: Implementation of STEAM Education for Gifted Students and Unit 6: Instructional Design of STEAM for Gifted Students also received scores above 4,7. The least valued were Unit 3: Curriculum Planning for Gifted Students and Unit 5: Teaching Basic Skills to Gifted Students Through STEAM Education, with scores between 4.1 and 4.3.

In general, we can conclude that the **STEAM Stars Open Campus** was reviewed very positively, with an **average score rating of 3,96/5** (average score of objectives, content, usefulness, usability, pedagogical methodology, guidance during the pilot, and overall rating).

Regarding the **STEAM Stars Assessment App**, it also received very positive feedback with an average rating of **4 out of 5** (average score of objectives, content, usefulness, usability, guidance during the pilot and overall rating).

Concerning the additional comments and responses to open questions, most of them were positive and encouraging comments about the materials. However, there were also very valuable comments and suggestions for improvement that have been taken into account when reviewing the final versions of the STEAM Stars materials, as well as for the dissemination and exploitation activities of the project.

Finally, regarding the application of the STEAM Stars learning materials, at the time when the questionnaire was completed, the pilot teachers did not have the opportunity to implement it in their classrooms. However, we have been informed that, after submitting their questionnaires, two teachers from the UK and one from the Netherlands had the opportunity to apply it with their students with very good results.