Robotics – Training for the New Age

Course Evaluation Report

June 2018

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Erasmus+ Programme
of the European Union

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Robotics – Training for the New Age (ROTENA)

COURSE EVALUATION REPORT

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1. OVERVIEW

The Robotics – Training for the New Age Training Course is an intellectual output of the European Union ERASMUS+ funded ROTENA Project.

2. THE PROJECT

This EU funded Project (October 2016 - September 2018) aims to use the motivational effects of robotics (including AI (Artificial Intelligence)) and 3D printing to excite students (particularly young people) about science and to develop programmes to enable them to engage in the "New Age Technology" revolution.

The specific aim of the Project will be to develop an introductory training programme, incorporating a combination of robotics activities and curriculum, designed to help teachers to teach programming skills to young people to enable them to gain knowledge and experience of these new technologies, including the use and application of 3D printing (which can be used to build the component parts of robots).

Robotics & 3D Printing Defined

Robotics is a multidisciplinary technoscience that combines mainly mechanics, electronics and computer science. Its goal is the research, design, development and building of robotic systems controlled by integrated circuits. ROTENA Partners see the learning and use of Robotics as a way to develop the skills that will allow people to build autonomous projects that will contribute not only for personal and professional development, but also for innovation and entrepreneurship. The knowledge acquired in this field will make the users technologically adaptable in a fast changing society.

3D printing refers to the process of additively building a three-dimensional physical object from a digital model data (Computer Aided Design or scanned object) file by depositing and forming successive layers of material under computer control.

A detailed "New Age Technology Training Module Framework" will be developed and, following pilot testing in Partner Countries, will be widely distributed for use by training institutions with the expectation that they will adapt/modify the modules to suit their organizational and cultural needs.

This Training Framework will provide an outline of what a New Age Technology training programme should look like and what it should contain in order to support and develop the European technology sector.

The Training Modules will be launched in September 2018.

3. TRAINING MODULES – PILIOT TESTING

The purpose of appointing evaluators/pilot testers who have a wide variation in skill sets, knowledge and experience was to ask them to give a broad overview of the course itself.

We did not want to test the evaluators knowledge of the subject matter. Rather we were looking for an evaluation of ease of use of the material, i.e. whether the structure, length, depth of the material will meet the aims as set out above.

The evaluation questions asked participants to review the material and to see if, in their opinion, there was enough material and detail to enable students to have an initial "grounding" in the subject i.e. if the material is sufficient and is 'fit for purpose'.

Methodology

- A webpage was created explaining the evaluation methodology and process (http://www.rotena.eu/trainingprogram.html);
- Evaluators registered their interest via an on-line form and all responders (77 in total) were sent a user name and password within 24 hours. This information gave them immediate access to the pdf draft course and the 22 online evaluation questions;
- The online "Evaluation Registration" was available from February 2018;
- The deadline for completing the questionnaire was 31st May 2018;
- The questionnaire was predicated on the evaluators' review of the course as a whole; and
- The Appendix to this report details the responses received.

Pilot Testing – Ovar Forma

The Pilot Testing activities of the ROTENA Training Course in a face-to-face environment were implemented in Portugal by CEPROF and Ovar Forma. They were performed between February and May 2018 and the target groups were trainees from

VET courses with different levels of knowledge concerning the topics of the course. Some trainees had never contacted with 3D Printing, nor Robotics and some had basic knowledge of one or both areas.

The trainees were monitored by a key person from the ROTENA team which is also an Electronics teacher, and the feedback was quite positive. The students were very motivated while following the Module's instructions. Although the piloting was in a face-to-face environment, the trainees were quite autonomous, as the materials provided were built to potentiate their autonomy.

The monitor was only a guide through the whole process and the trainees were curious to learn more about the training course and were eager to participate in the selection process for the Robotics Competition, which happened at the end of the process. Each team is constituted by trainees that participated in the Pilot phase as they were given the chance to do Module 5 that is the assembly of the Robot.

At the end of the sessions, the participants filled an evaluation form so that their opinions were taken into account for future improvements to introduce in the materials / course. The form was not answered by all the participants as some technical problems were experienced during the process. However, 77 answers were collected, which provides a significant number of opinions to consider in the analysis of the training materials.

Training Modules – CEPROF

The New Age Technology Training Modules were developed to allow that the beneficiaries could use the materials on-line and in face-to-face environments.

They were built for beginners as this is a training course to acquire basic knowledge on Robotics and 3D printing.

The feedback from the report given by the pilot testers was very positive and was in accordance with the partners' expectations.

Most participants were motivated by the training modules, the simple language, the teaching step by step and the support videos.

However, some participants referred that they would like to have more exercises to do, especially in the 3D Modules. The team will then introduce more exercises on Module 1.

Summary

Overall, the course was very well received by the evaluators. These are some examples of their comments:

- I recommend this course because anyone can understand the language that is used and is also very clear and simple course
- I like this course in this format
- More time for 3D design
- I like this course
- More information and pratical exercise for 3dprinting
- More pratical
- I like recive more information this course in classrom
- Well researched, written, and designed
- Clarity of explanation and easy access
- doesnt have weaknesses just strengths
- I think that it only have strengths!
- Very good to understand how bulild a circuit and program him
- In my opinion, I think the strengths of this course are the very good explanation of the topics approached with videos and schematic tutorials but with all this help ways the weakness its the lack of more information to conclude with knowledge we want but still be a very good course
- Strenghts: Doesn't have massive amount's of text
- It's a very complete course, but sometimes very complex and overwhelming
- The strength learning alone, the negative is not exist sequence this course
- The positive is receive more information about programing the microcontrolater The negative, i need more time for 3d design
- I have not found weak points, I think there are quite a few good points about everything
- too much Scrolling to reach the essential pages
- I think can be a bit better. I would like it to be more striking
- The visual design I think can be better when the site get more people interested for the course but right now its very good because have no difficulties for new people here
- The visual design should be more explit , it seems hard to see the steps that are given
- its simple and smooth, very good visual design
- it is a great way to reach all learners, regardless of location and time constraints
- Would recomend....it's very good for starting to learn about 3D printing
- Yes, beacause you learn everything or almost everything about printing and making the 3d object

(NOTE: these comments were copied directly from the source)

A number of the issues raised will be addressed in the final published version of the course in September 2018.

It is clear that the evaluators' experience, knowledge and expertise spanned a wide spectrum, as evidenced by some of the answers given. However, from the professional to

the novice, the course met the objectives that were set for it and achieved a very high standard.

NOTE: Some of the evaluators had taken a "classroom based" evaluation exercise but included their experience in the online survey.

4. RECOMMENDATIONS

- The specific issues raised by some evaluators will be reviewed and addressed during the development of the final version of the course;
- As regards the "exploitation/marketing" of the course it should be made clear to training institutions wishing to offer the course that the preference is for classroom based delivery and/or blended learning.
- The overall course structure should be followed and "Module Experts" should be used to deliver individual face-to-face modules.
- Given that the results show that 74% wish to take the course in a classroom setting as opposed to 24% who wish to take the course online, it is strongly receommend that the course be deliverd in a classroom based format.

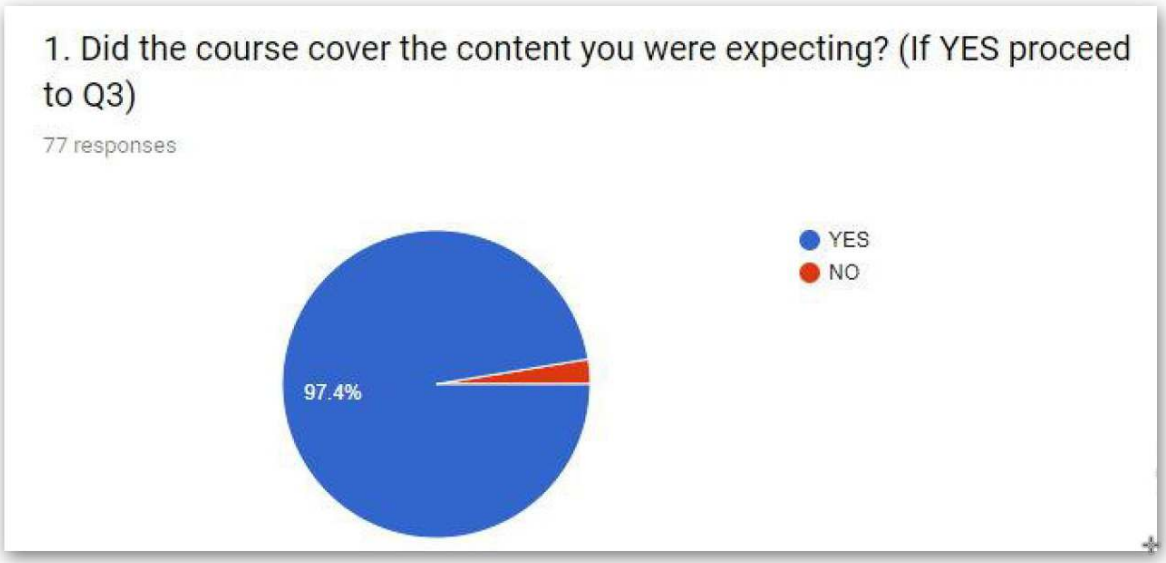
--ooOOoo—

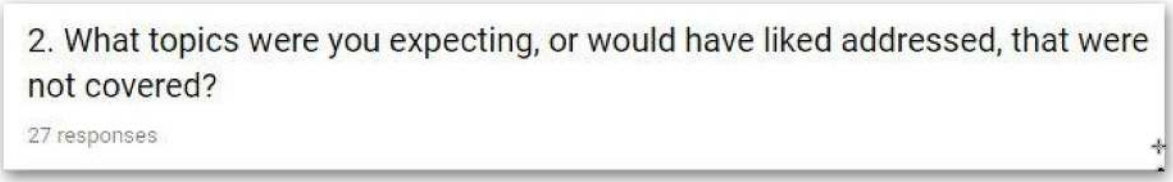
www.rotena.eu
info@rotena.eu
+44 1482 651695

APPENDIX

Detailed responses from all pilot testers.

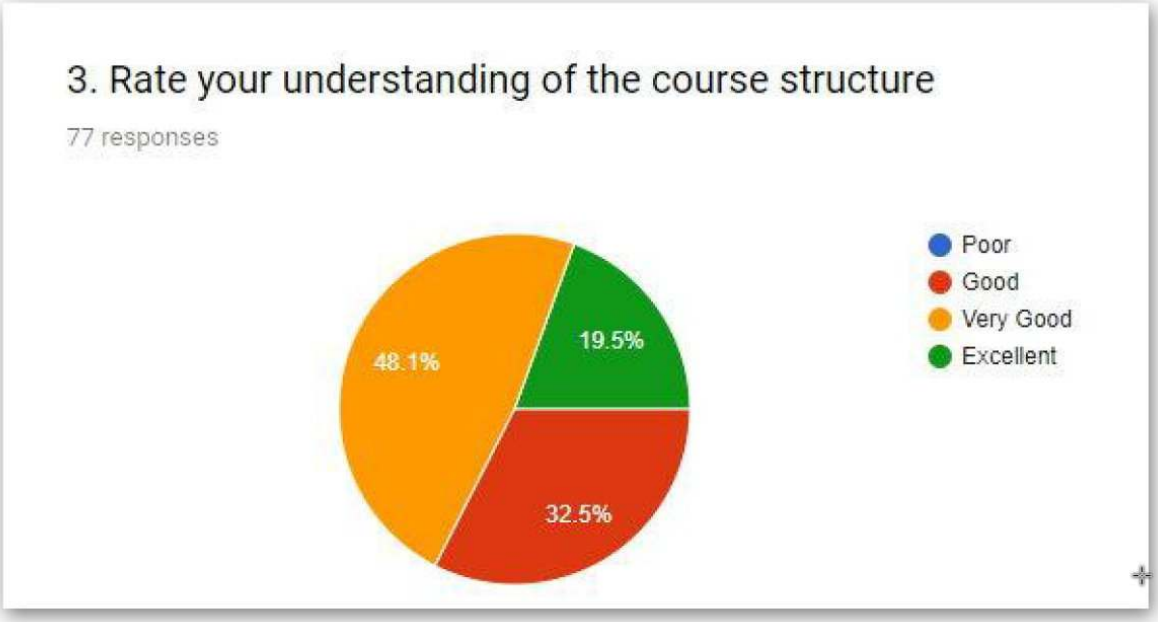
Note: The responses have been faithfully reproduced from the evaluations received.

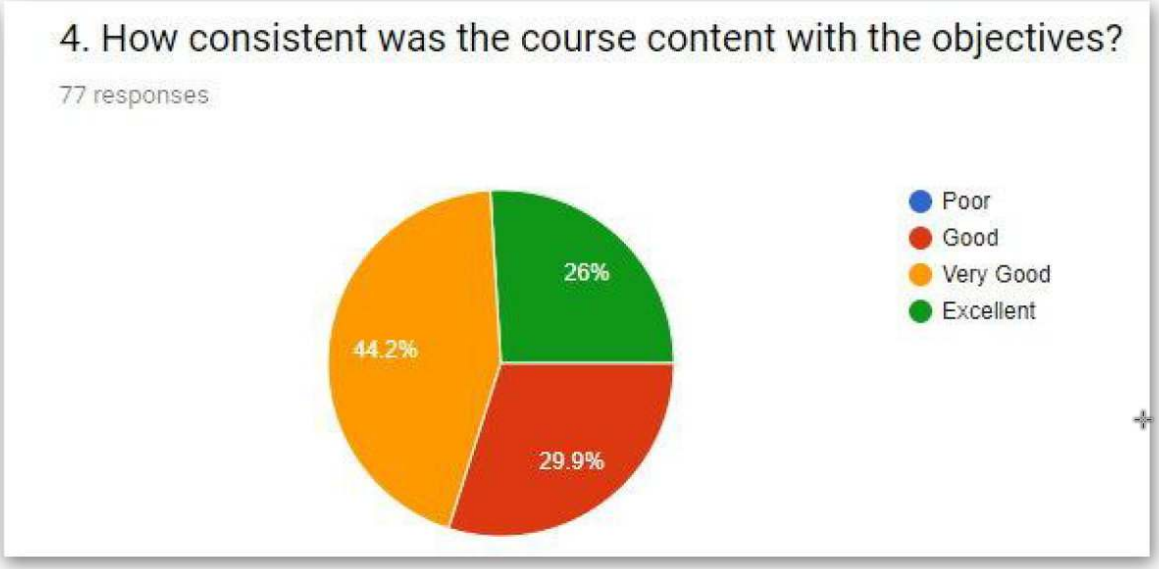


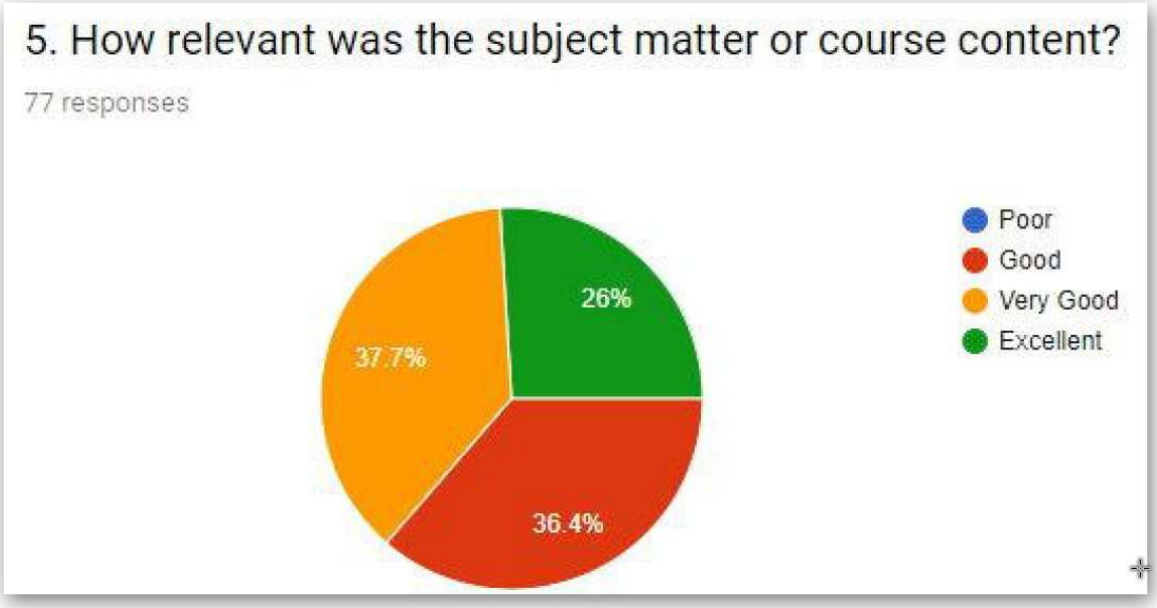


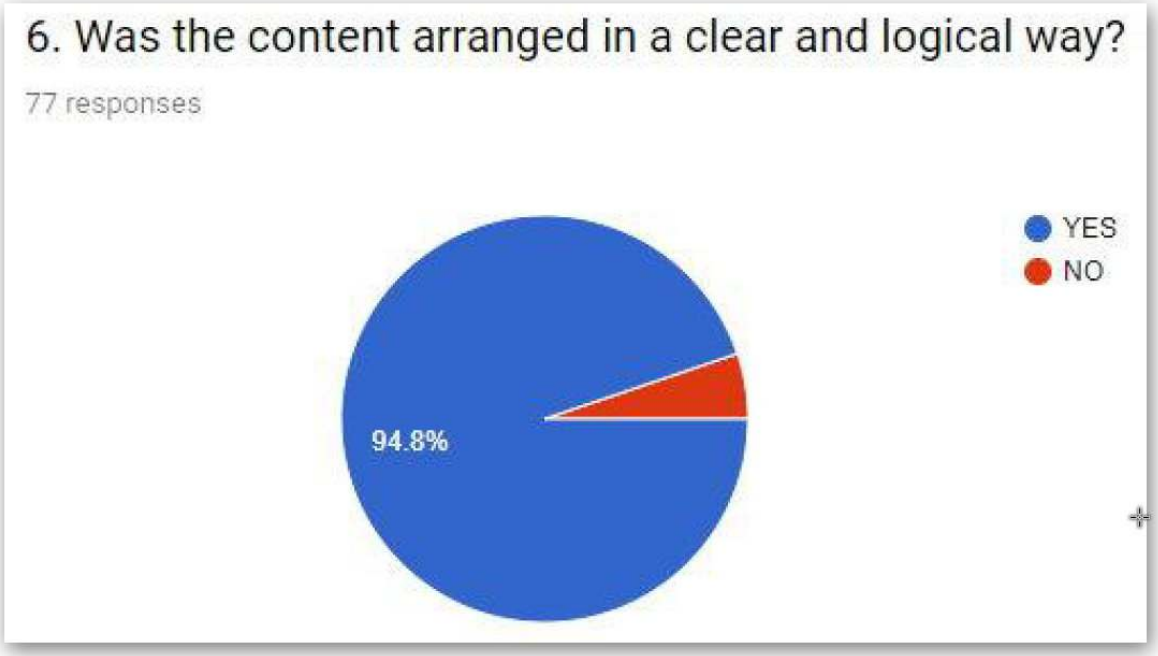
Nothing (2)
Anything (2)
No (2)
Soldering (2)
None, all of them are present.
Mais mecânica
Esta bom assim.
Im expecting a tutorial of 3D print machine and programating and try get more knowledge about this topics/area without need get a normal course with many hours
All about 3D print
I like this course.
More pratical.
I did not understood very well the steps that were given.
More pratical
More phisical
The Eletronic and 3D printing is an area not interesting for me
More time for 3D design
More information and pratical exercise for 3dprinting
THE TOPIC ARE WHAT I EXPECT

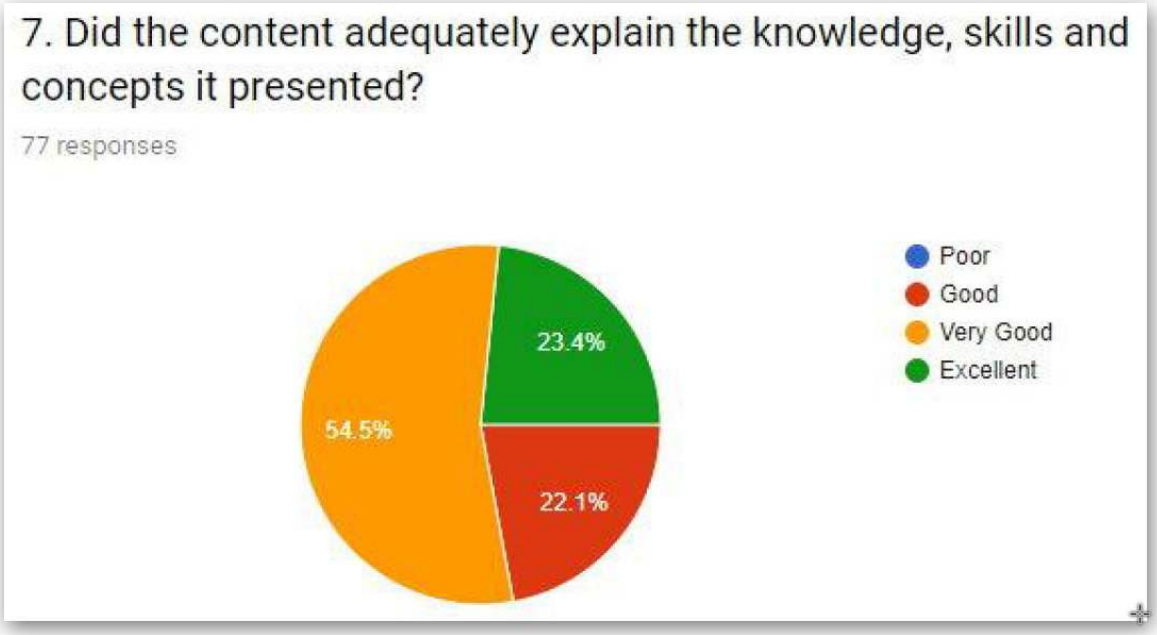
I d`ont know
I like this course in this format
I like recive more information this course in classrom

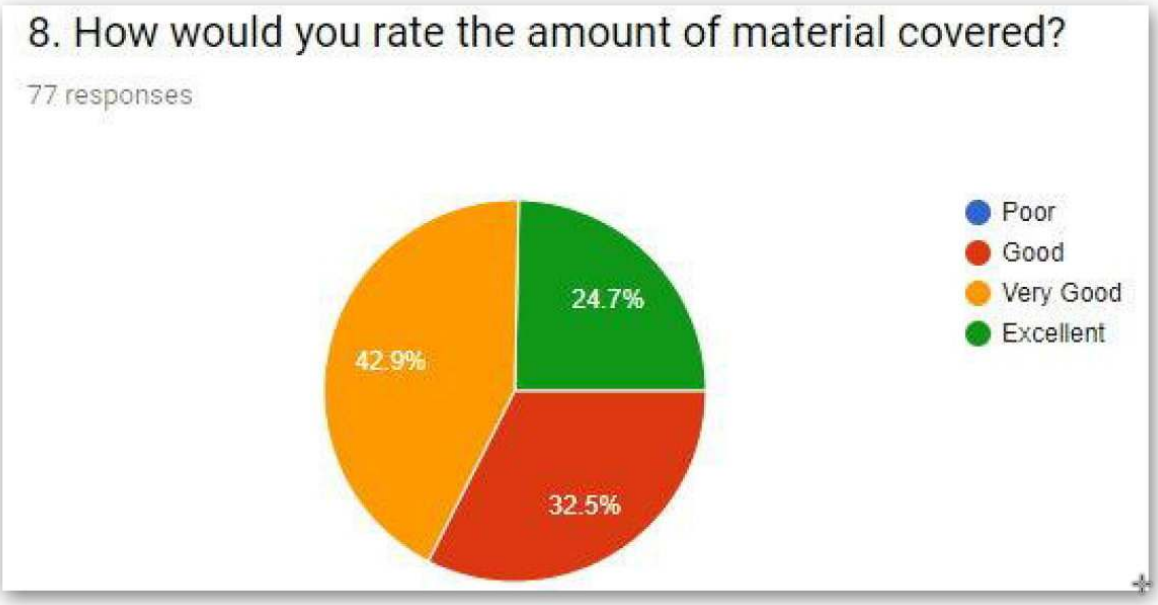


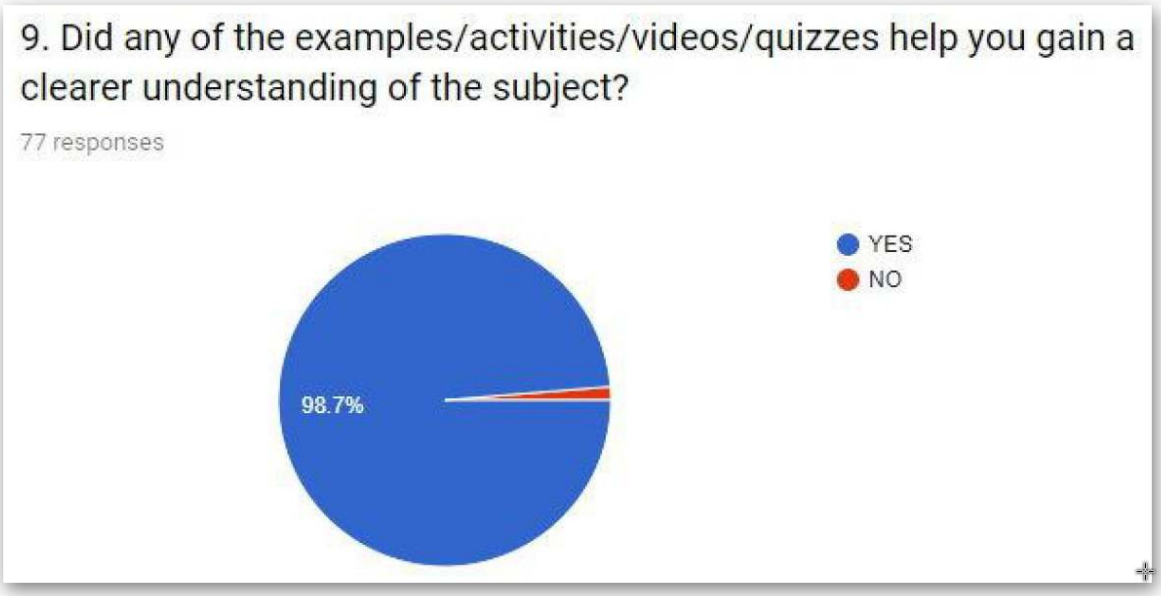


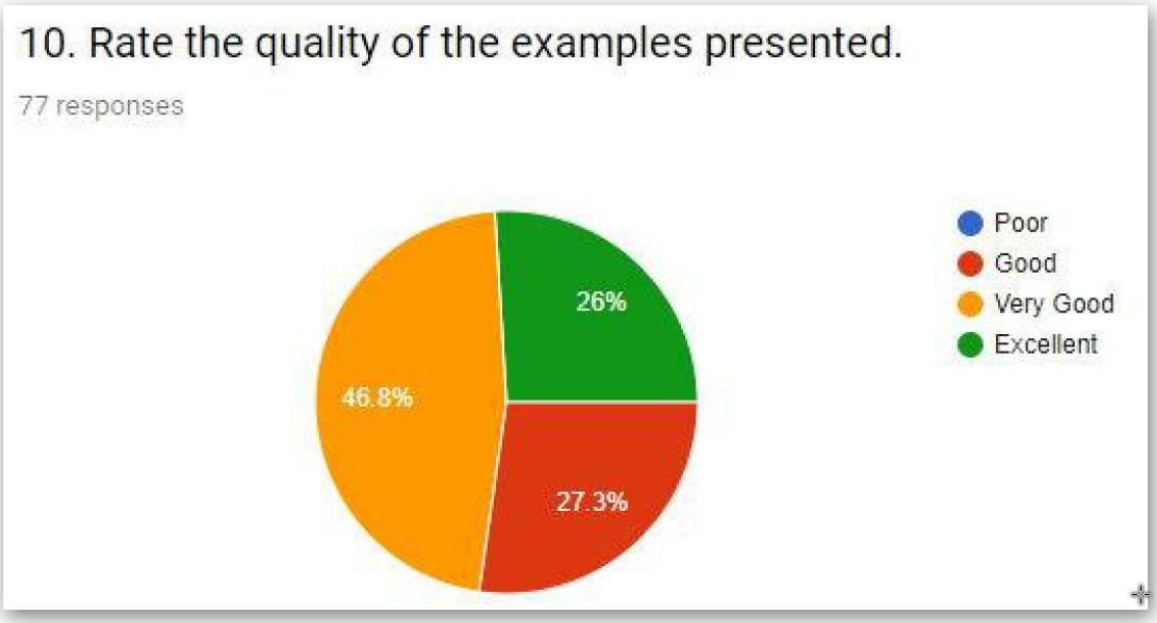

5. How relevant was the subject matter or course content?
77 responses
26%
37.7%
36.4%
Poor
Good
Very Good
Excellent

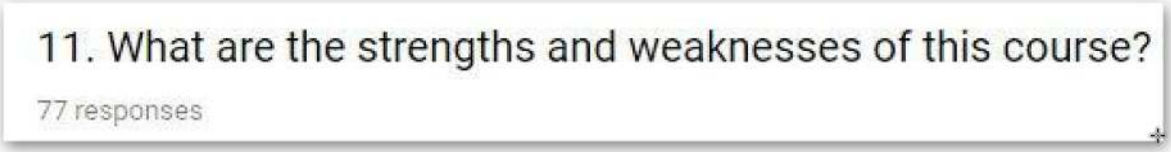

6. Was the content arranged in a clear and logical way?
77 responses
94.8%
YES
NO


7. Did the content adequately explain the knowledge, skills and concepts it presented?
77 responses
23.4%
54.5%
22.1%
Poor
Good
Very Good
Excellent


8. How would you rate the amount of material covered?
77 responses
24.7%
42.9%
32.5%
Poor
Good
Very Good
Excellent



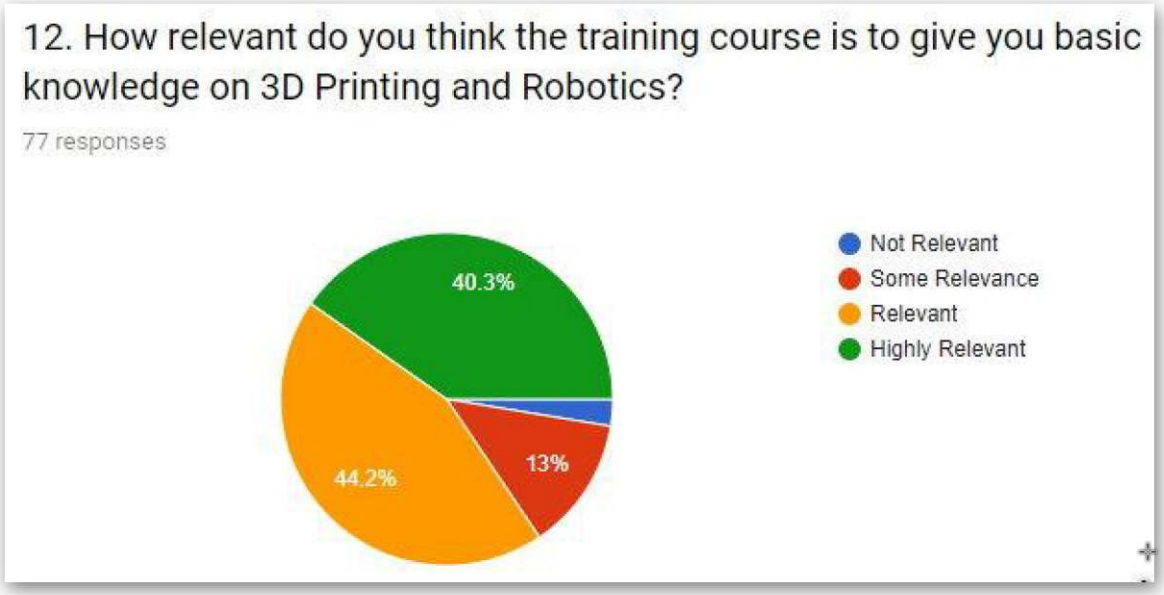


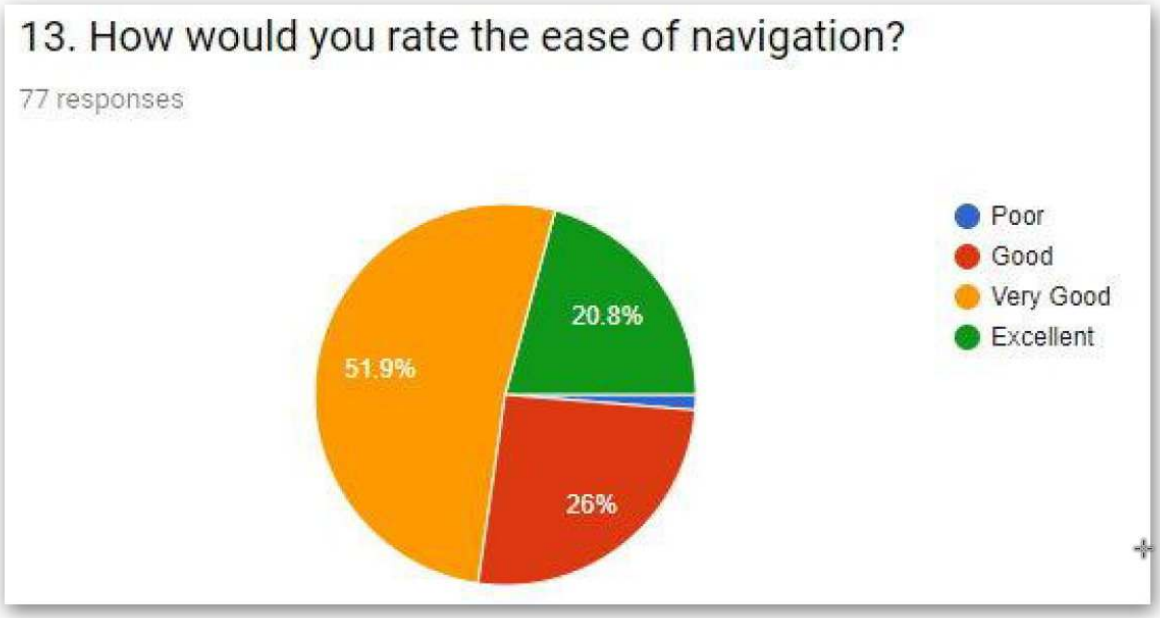


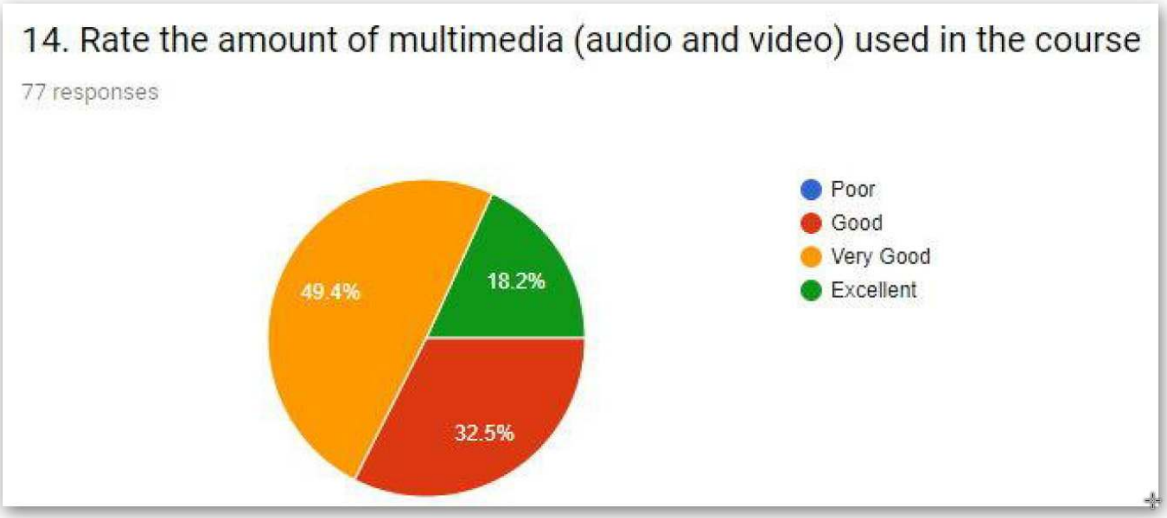
Nothing (2)
highly topical, can an individual follow without a teacher?
Well researched, written, and designed
Clarity of explanation and easy access
não sei

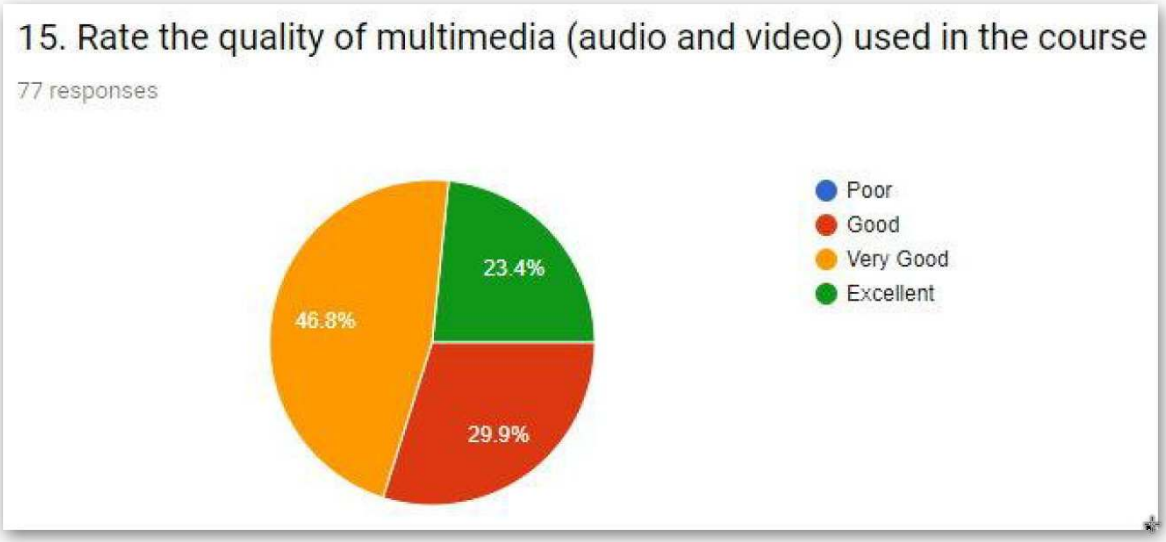
Se learn a lot of things in this course
doesnt have weaknesses just strengths
Nenhum
I think that it only have strengths!
Its all good
Very good to understand how bulild a circuit and prog ram him.
Learn new things
strong point of the 3d printer
The strenghts are the videos are very helpful and weaknesses is some things are out of date...
Um ponto forte é o facto de existir muita prática
é um curso simples e facil de se fazer , pois é um culso ao alcance de qualquer pessoa
In my opinion, I think the strengths of this course are the very good explanation of the topics approached with videos and schematic tutorials but with all this help ways the weakness its the lack of more information to conclude with knowledge we want but still be a very good course
A strenght is that we work with the future
clear structure
Clear explication
good to learn how to work with 3d printing and other things
i think the strength is ,the help that course give to us
é bom
None
The strengths points: organization, content, dont have wakness points
No
Strenghts: Doesn't have massive amount's of text
In my opinion this subject is an asset because it is quite interesting to capture the students' attention much more.
In my opinion there are no weaknesses and the presentation was well done
It's a very complete course, but sometimes very complex and overwhelming.
robotica
it´s good to learn alone
All in this course are strengths
so many
Toda a gente pode aprender sem qualquer custo
When i started i thought that was going to be hard and confused but once i started working on this course i feelt that it isn´t so difficult after all. This is a cool course to work.
O curso é grátis, e assim torna acessível a todos.
The strenghts is the explain the step by step.
self-learning -Positive
The strength learning alone, the negative is not exist sequence this course.
Te strenghts is the course is a good formation for student
The strenght of this course are the components we can use to create a projet that will be able to make it come true . The weakness of this course is that is a little bit hard to

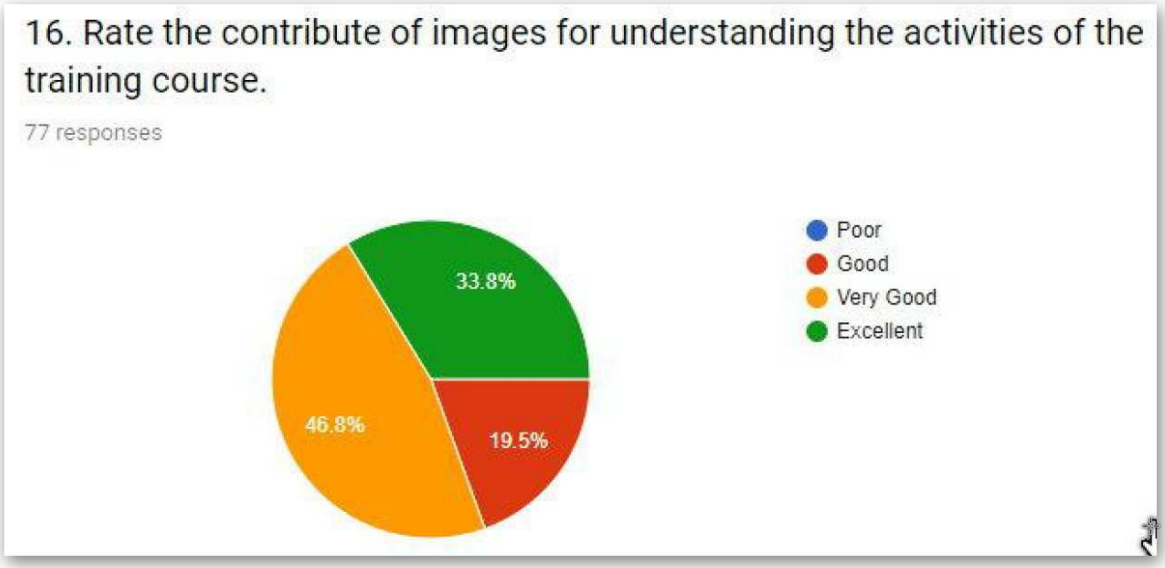
learn without any teacher , for some is more easy to do it , but for few is more complicated than it seems.
The strengths descrition the weaknesses is not more pratical
The strenght help the students in 3d printing and eletronic assembly
The fact that I do not like the area conditions my answer
More time for finnish
More pratical
The positive is receive more information about programing the microcontrolater The negative, i need more time for 3d design
I need more time for pratical
Positive is more learning about this and negative i dont want this for my future making some pieces of wha5t we need
Pontos fortes: Ser facilmente acessível Pontos fracos: Nenhum
Strengths: It's an online plataform and easy to practice; Weaknesses: I think it don't have weaknesses points.
nao sei
O Curso e muito enriquece-dor
pontos fortes explicou muito bem a matéria pontos fracos não existem
Aprende-se muito neste curso
aprendes coisas novas
its simple and i dont see any weaknesses
actually i don't remember
More information about eletronic
It's complex.
This course has a lot of output in my aspect the weak point does not have
I have not found weak points, I think there are quite a few good points about everything
The reliabilty of the information

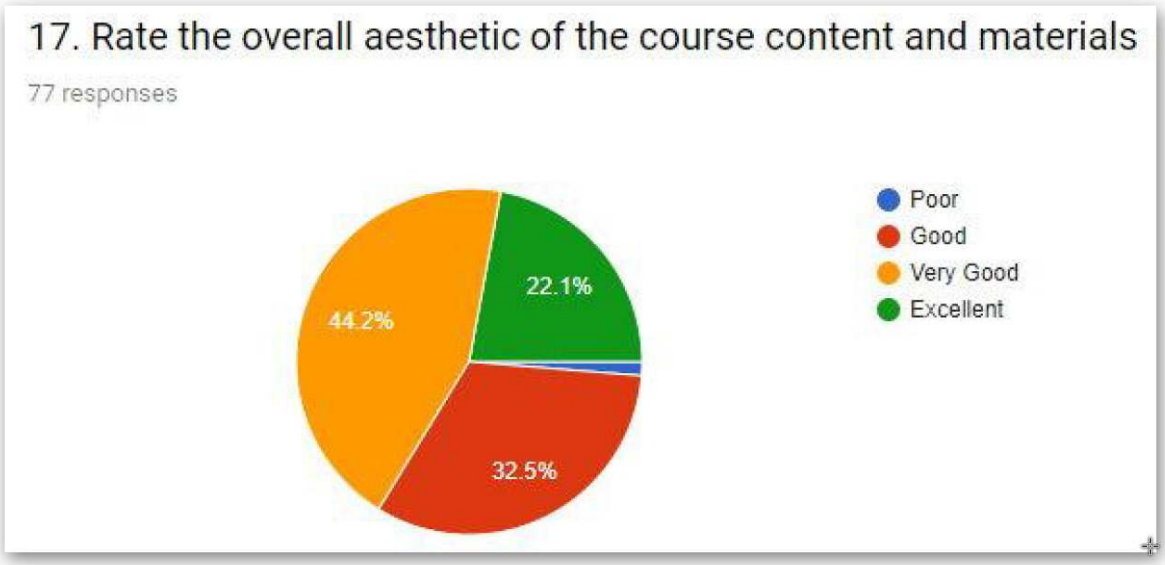


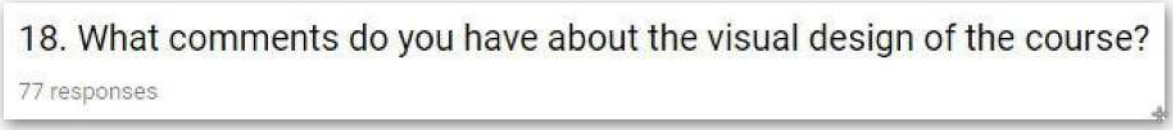

13. How would you rate the ease of navigation?
77 responses
20.8%
51.9%
26%
Poor
Good
Very Good
Excellent


14. Rate the amount of multimedia (audio and video) used in the course
77 responses
18.2%
49.4%
32.5%
Poor
Good
Very Good
Excellent


15. Rate the quality of multimedia (audio and video) used in the course
77 responses
23.4%
46.8%
29.9%
Poor
Good
Very Good
Excellent

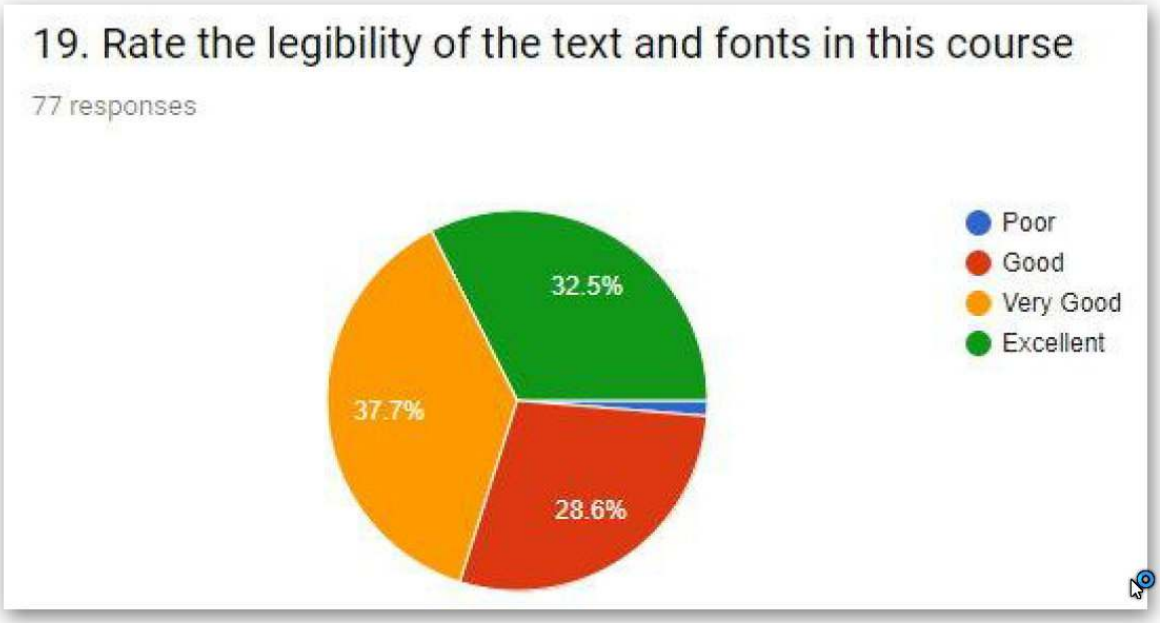

16. Rate the contribute of images for understanding the activities of the training course.
77 responses
33.8%
46.8%
19.5%
Poor
Good
Very Good
Excellent

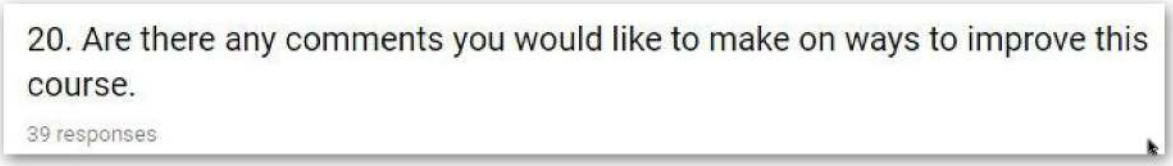




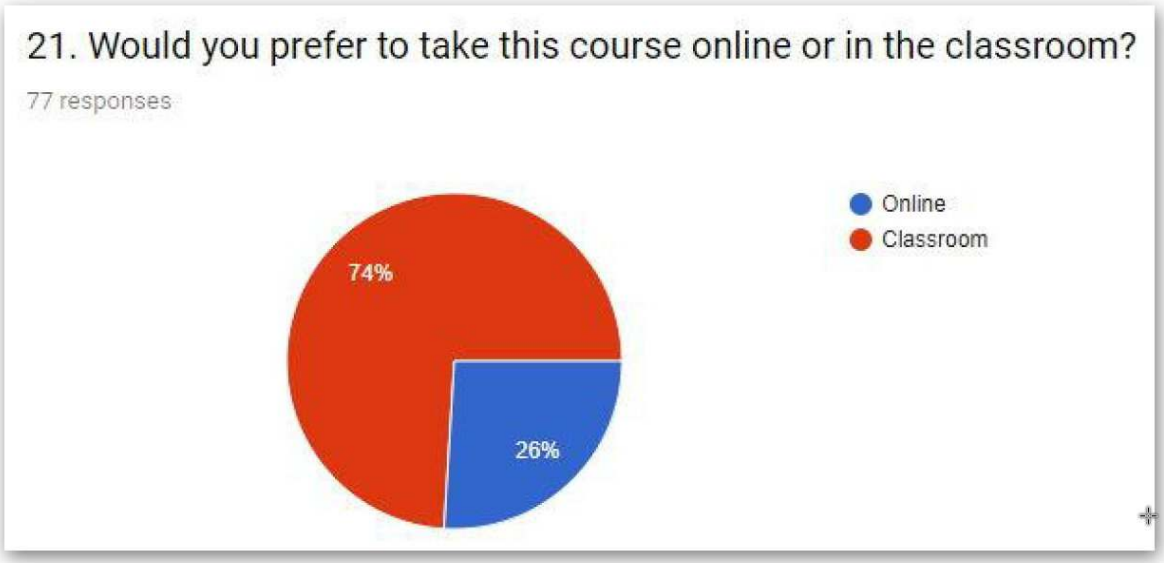
No (9)
Nothing (3)
muito bom (2)
too much Scrolling to reach the essential pages
Well done
I think can be a bit better. I would like it to be more striking.
It is very nice
Excellent (2)
Spectacular
The visual design is very helpfull.
Good design
Podia estar melhor
Is quite simple because anyone can understand what the content demonstrates.
Está bastante bom
o visual esta bastante simples o que facilita a navegaçao
The visual design I think can be better when the site get more people interested for the course but right now its very good because have no difficulties for new people here.
it ´s very good (8)
really good
no comments
It's a good course but I have to work.
very well
It´s good desine and verry easy to understand
It was good enough.

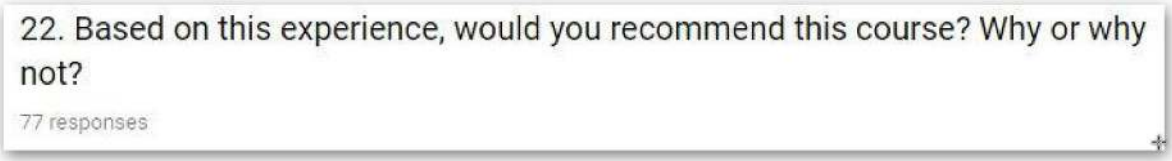
quite positive
is very interesting
Pretty good, i had no issue with it.
robotica
it´s good
está bem explicito
I don´t have any extra comments.
Achei que tem um design bonito e moderno.
Good
Anything
The visual design should be more explit , it seems hard to see the steps that are given
The visual is good
No comments
the visual of the curse was very good
Nenhum
They are good.
nao sei
Possui um design visual exelente
esta bastante bem feiro
Tem um bom design visual
é mais facil de aprender
its simple and smooth, very good visual design
Its ok very beatifull
Nothing.
I do not have comments
it's good
Its a apeiling one





No (25)
None that I can think of since the developers did a great job
More tutorials for more knowledge and for make a excellent course to get a good job
No, for me it's very good.
robotica
Nothing
Anything
More pratical
I don't think so.
I do not have comments, for me this is a very good course that will help many students





Yes (31)
Yes, because it deals with a relevant subject
Yes, it is a great way to reach all learners, regardless of location and time constraints
yes, I think it´s a good course with a excelent materials.
Yes because ir os very inportant
Yes, because i liked
Porque bom.
Obviously!!
Yes is very good to explain to the people who are eletronic

Yes,because its a good chance to learn new and good things
I recommend this course because anyone can understand the language that is used and is also very clear and simple course...
sim pois é bastante simples e bastante util
Yes because the world with new improvements and technological inovations at industrial area need more and more a good knowledge about new industry so with my experience on that course i think anyone need experiment it
yes , it´s a course with a big employability rate
yes, because is easy to undertand and very interesting
yes because its a really cool thing to learn
yes, to learn more about this
é muito bom cara... recomendo a quem queira aprender algo sobre impressoras 3D. o Prof. Lino é o melhor mais bom.
yes, beacuse its very intressant.
Don´t know
Would recomend....it's very good for starting to learn about 3D printing.
I would recommend it because it is quite interesting and I think several people would like to know how it works and they would also like to know what it is.
YES, is very interesting
I would recommend, because why not.
robotica
Yes, beacause you learn everything or almost everything about printing and making the 3d object
yes because it´s enriching
sim, pois o curso tem a informação bem explicita e tem a vantagem de ser grátis
I think that people who like 3D printting should try it.
Sim, eu recomendaria porque é grátis, fácil de aprender e útil
Yes. I think the course are important in future
Yes I whould , it can be useless in the future .
yeah becuase it give alot of experience about dattopic
Sim, porque é muito bom e é facilmente acessível
SIM PORQUE E INTERESSANTE
Yes , it can be good to know about the course and the robotic world.
sim, pois ajuda bastante a perceber a matéria
sim por que é muito interessante
yes because it´s a good course to teach people
yes because it can help someone that wants to know about 3d
Maybe
Yes, because there is a lot of exit.
I recommend this course because it has a lot of
I would recommend the course because there are many good contents to be studied and it was very good
Yes,its a goood course to have in the future

--ooOOoo--