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BLISS project



EXELIA

BLISS

Report on testing and evaluation outcomes

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EXELIA

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Contents

1. INTRODUCTION	4
Background to the research	4
2. METHODOLOGY	5
2.1 Purpose of the research	5
2.2 Survey duration.....	5
2.2.1 Target groups	5
2.3 Tools	6
3. RESULTS	7
3.1 Demographics/ Participants.....	7
3.2 Participants' previous experience	9
3.3 Rationale behind VOOC participation	10
3.4 User experience and clarity	10
3.5 Technical operation.....	14
3.6 Usability and visual design	17
3.7 Communication and interaction issues	20
3.8 Suggestions.....	22
3.9 Recommendation of the course	23
4. LIMITATIONS	24
5. CONCLUSIONS	25
6. ANNEXES	26



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1. INTRODUCTION

Background to the research

The main output of this activity is the Vocational Open Online Course, which includes the produced BLISS learning outcomes within a contextualised online training form that comprises lecture notes, presentations, multimedia files, evaluation questions, multiple choice questions, practical exercises and work assignments. The BLISS VOOC which is available in English and the six national languages (FR, NL, EE, IT EL, and BG), includes video units supporting materials and a discussion forum for interaction among learners. At the final stages of the online course delivery, the partnership ran a 2-week pilot online course in English to test the VOOC's functionality and identify weaknesses, areas of strengths and opportunities for improvement.

2. METHODOLOGY

2.1 Purpose of the research

The pilot phase enabled the evaluation of different aspects of the VOOC use which included: a) the clarity of the VOOC structure, b) the usability of the developed learning and assessment material, c) the technical operation of content and communication mechanisms and d) connectivity/ accessibility issues. VET providers, learners, trainers and field experts were invited by project partners to conduct the pilot-testing of the VOOC and complete the online questionnaire for the evaluation of both the learning objectives and the quality of the developed learning materials. The pilot-testing period was completed within October 2019 and this report is a compilation and analysis of the testing and evaluation results, which can help to fine-tune and optimise the BLISS VOOC.

2.2 Survey duration

The VOOC pilot online course took place in English and lasted 2 weeks (from end-September to mid-October 2019), making available to the selected target groups learning materials of 120 -160 hours. The learners who evaluated the course have spent roughly 5 – 7 hours per week, to study the materials and complete their assignments. The typical course week consists of several lecture notes, interspersed with reading literature of work on exercises and work assignments. This report document summarises the results of the pilot run survey in a visual manner, to facilitate the update of information.

2.2.1 Target groups

The main target groups of the project are:

- ICT professionals already employed in a field employing blockchain technology;

- Initial VET students aspiring to work on blockchain projects or blockchain developers;
- VET providers that offer programmes that can be attended by ICT professionals;
- Trainers and field experts that aim to assess.

2.3 Tools

The online survey was developed via EXELIA in English and was distributed by all partners to their networks via a direct email campaign, which included the link to the English form. The reason behind the use of an online survey, as a tool, is due to its advantage to address a large audience; the networks of the partnership are large enough to be addressed within focus groups and direct interviews. Additionally, this survey-based questionnaire allows for a specific set of data to be collected, while standardised surveys are relatively free from several types of errors.

The criteria of evaluation of the questionnaires are directly connected to the project's key objectives and outcomes. The project goals and outputs will be assessed by this specific target group and measured against the proposed benefits and estimated impact. We will use the methods, allowing to develop those criteria, addressed to the involved stakeholders and gather information. The opinion of the target groups of the project will, also, be reviewed and analysed/ measured against the project expectations.

Upon receipt of the completed surveys, the gathered data were produced in the form of Microsoft Excel spreadsheets in English. Statistical computations and analyses assume that the variables have a certain level of measurement and are appropriately defined during the development of the questionnaire. Consequently, variables can be defined as nominal, ordinal or interval to avoid nonsensical results. Prior to data processing, valid responses were reviewed and mapped into specific variables based on the type of the question. In the case of ordinal variables, responses were recorded in numerical values to facilitate quantitative

processing. Basic tools of descriptive statistics like counts, means and percentages were employed to extract useful information.

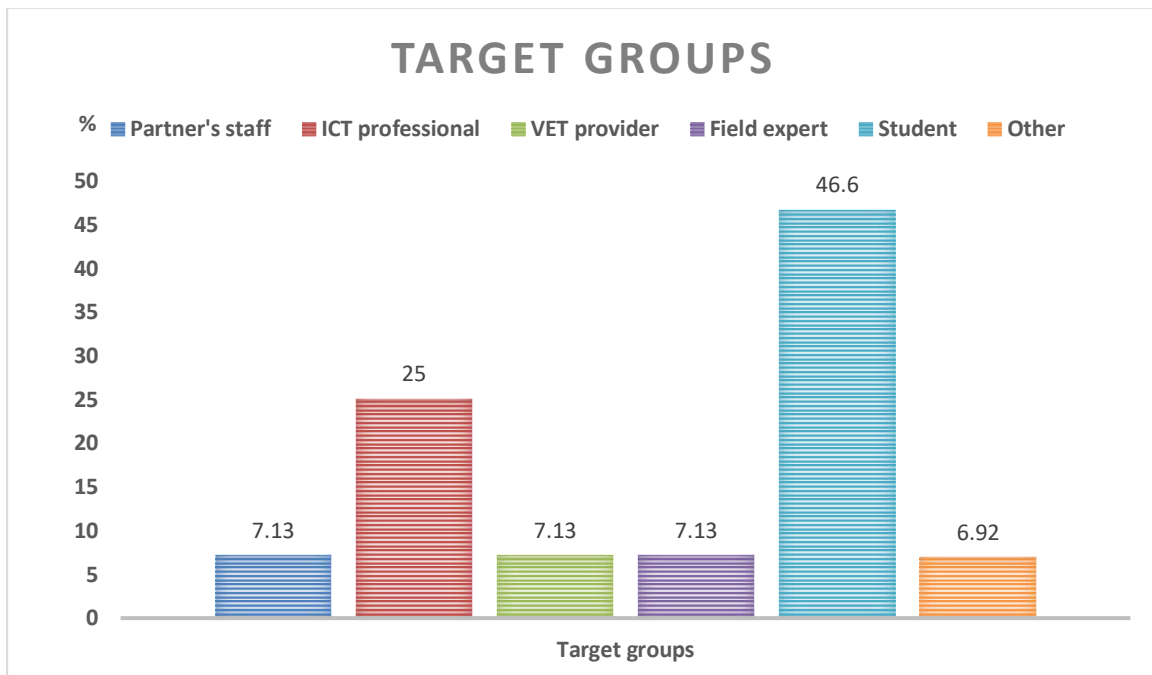
3. RESULTS

Data collection consisted of online research conducted in October and November 2019. For the implementation of this online research, EXELIA developed an online questionnaire form to be used by all partners, in order to involve as many national target groups as possible (France, Belgium, Estonia, Italy, Greece and Bulgaria).

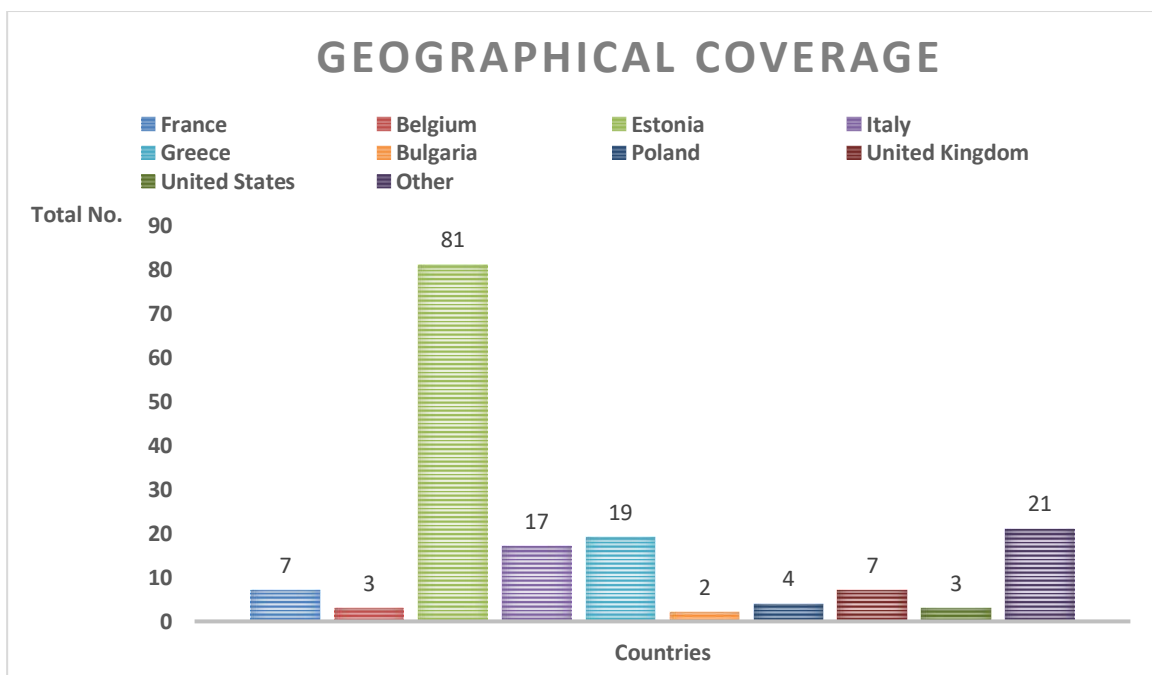
3.1 Demographics/ Participants

The survey, which aimed to test the BLISS VOOC's functionality and to evaluate its content and usability, as well as to identify weaknesses and offer suggestions for improvements, consisted of **25 questions**. It was sent to ICT professionals, VET providers, future ICT professionals (students), sector representatives and field experts. Overall, the target for participation in the evaluation of the BLISS educational resources was 300 participants for all countries, however the survey was completed with **164 respondents**. Due to the non-obligatory nature of most questions, the **full records in the survey are 30**.

The participants per target group were listed as showcased below:



The actual participation numbers by target group are presented in the **annexed Table 1**. The majority of participants were from the BLISS consortium countries, however approximately 21% of the total participants were from third countries from the EU and beyond. Amongst others, a total of 7 participants from the United Kingdom, 4 from Poland and 3 from the United States.



3.2 Participants' previous experience

One of the important criteria of the pilot-run survey was to take into account the previous experience of the respondents with similar courses, in order to assess how familiarity with the context affects the ability to collect feedback from different target groups in all the countries of the partnership, which deliver training in ICT and/or blockchain skills for ICT professionals. The options were organised under the categories:

- First time to take an Open Online Course
- From 1 to 3 times
- More than 3 times

The options for the participants to state their previous experience were represented as showcased below:



The actual results are available in the **annexed table 2**.

3.3 Rationale behind VOOC participation

This question aims to reveal reasoning behind the VOOC trial, therefore to assess the needs that the online course covers, as well as their expectations from taking the course. This question is deliberately used in the form of an open question, to provide the participants to use their words while giving feedback, to reveal the strength of their opinions, phrase their comments and feedback in a way that we cannot anticipate, and give accurate representations of personal views.

The majority of respondents participated in the VOOC course following the suggestion of a colleague or out of suggestion or curiosity. Most of them are ICT professionals or ICT students who wish to get employed in blockchain related jobs and sectors. Some of respondents stated they wanted to „learn new things“ or they „have an interest in this field“. A smaller percentage of respondents have participated in the survey in order to try an online course.

Regarding their expectations from the course, **all respondents declared happy** with the experience and found it interesting and useful, explaining how they are thinking of using the material in their own network.

The answers are recorded in the **annexed table 3** presenting data regarding the reasoning of participation per respondent and their expectations and **annexed table 4** provides data regarding their expectations being met.

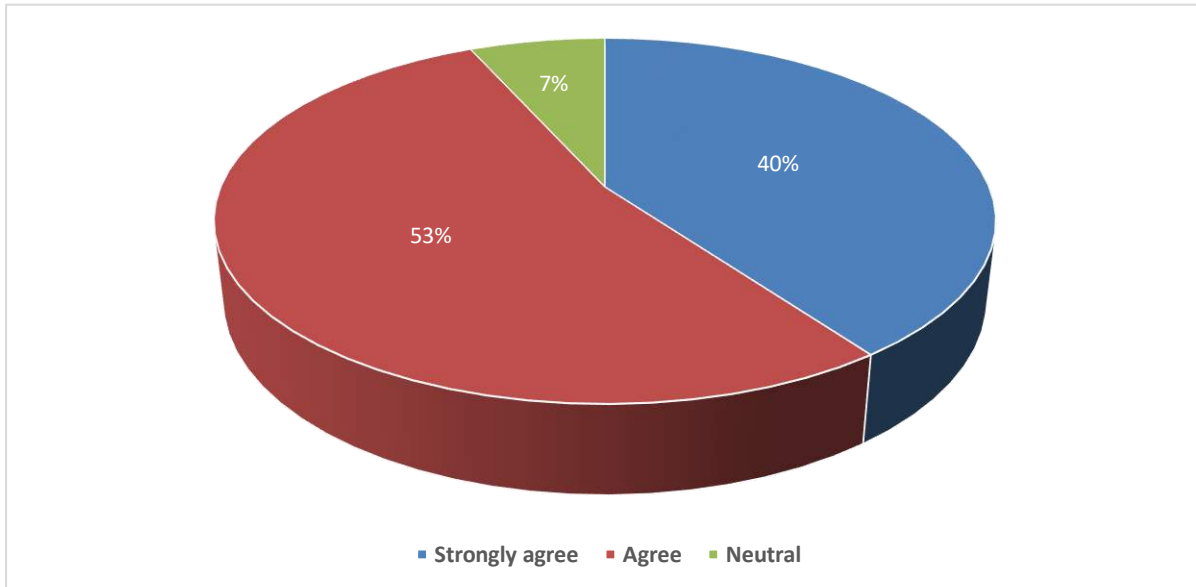
3.4 User experience and clarity

The rating of the user experience on basic VOOC functions aims to rate how operational and easy to understand and use these features are. The question asked was “When thinking of your experience with the BLISS vocational open online course, how much do you agree/ disagree with the following statements?” The following graphs present the percentages of the responses that were collected to the six main statements regarding the user experience.



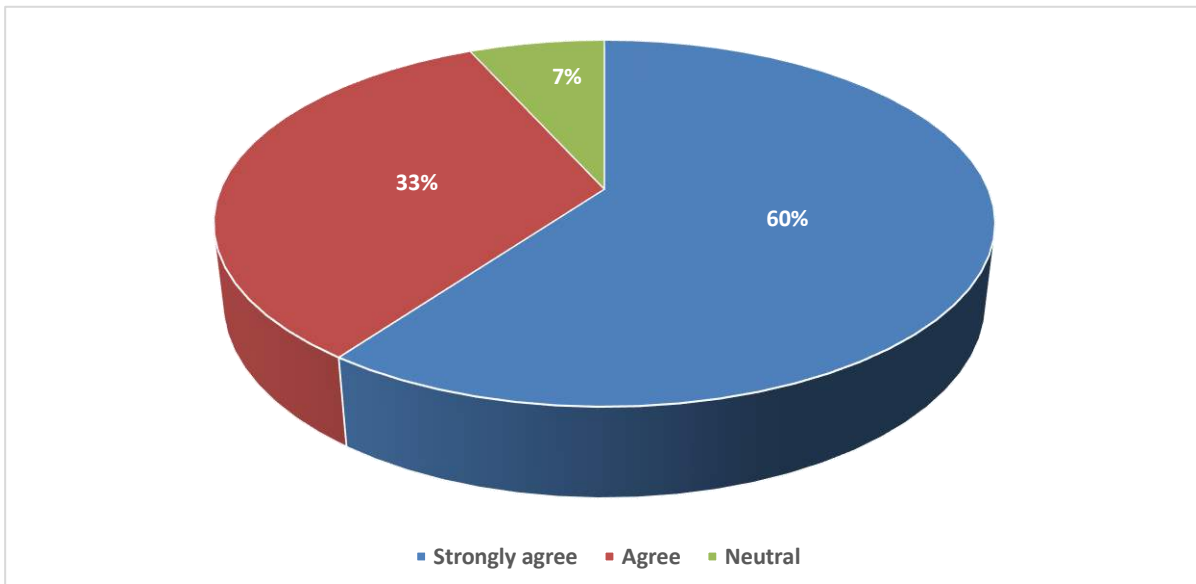
Statement 1:

It was clear what I had to learn from this course.



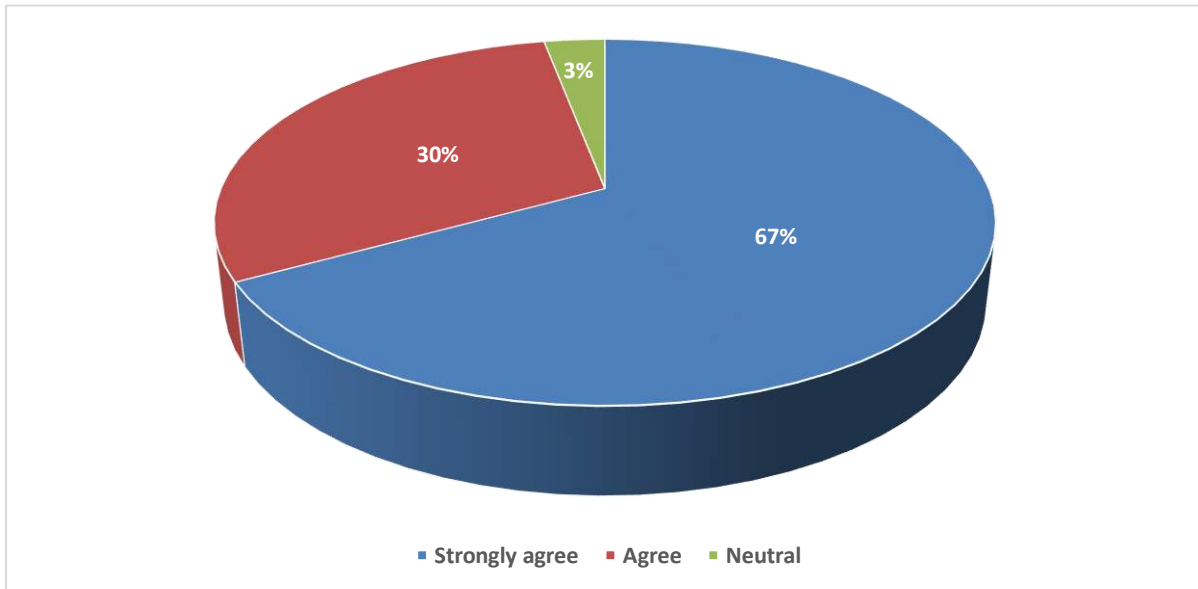
Statement 2:

I was able to easily choose the parts of the course I wanted to attend.



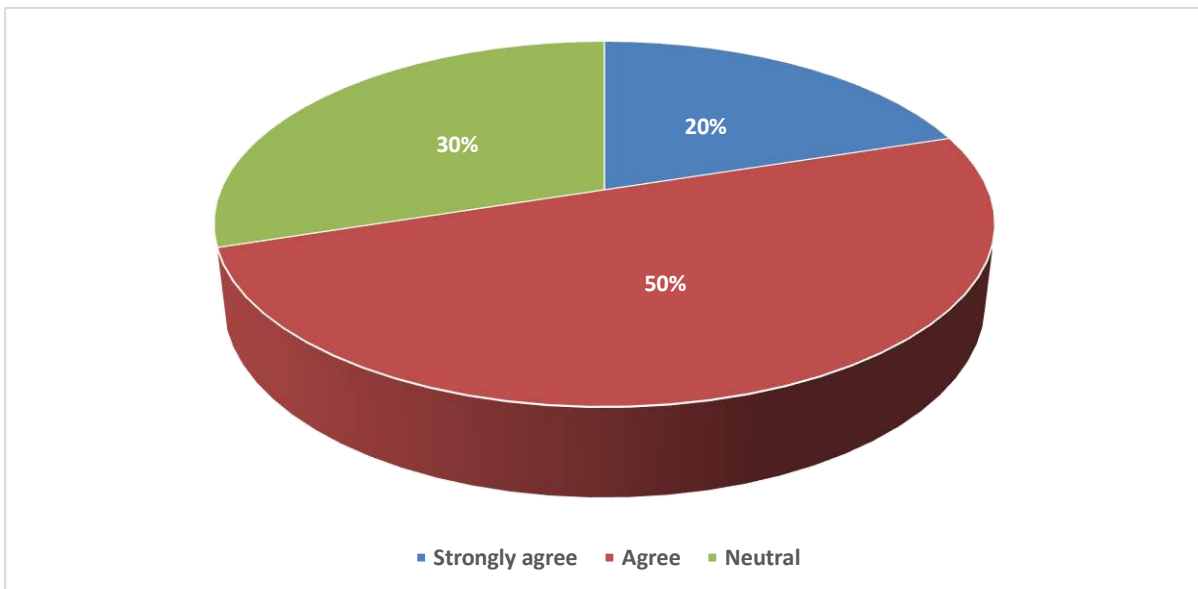
Statement 3:

It was easy for me to follow the course at my own pace and on my own time.



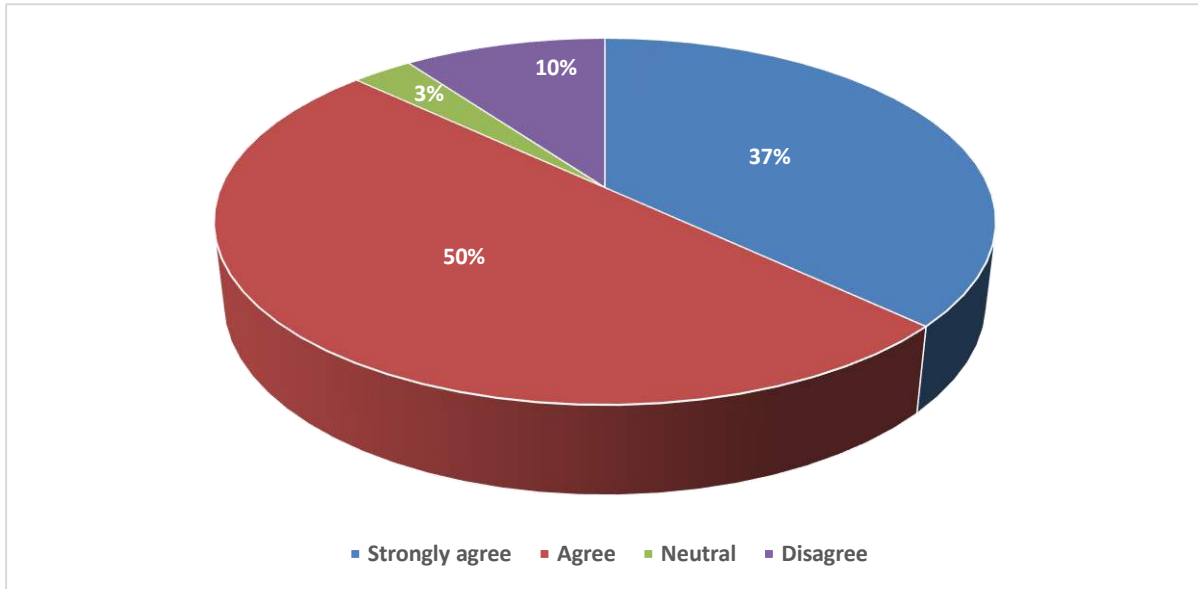
Statement 4:

I found that the course provides a good balance between theory and practice.



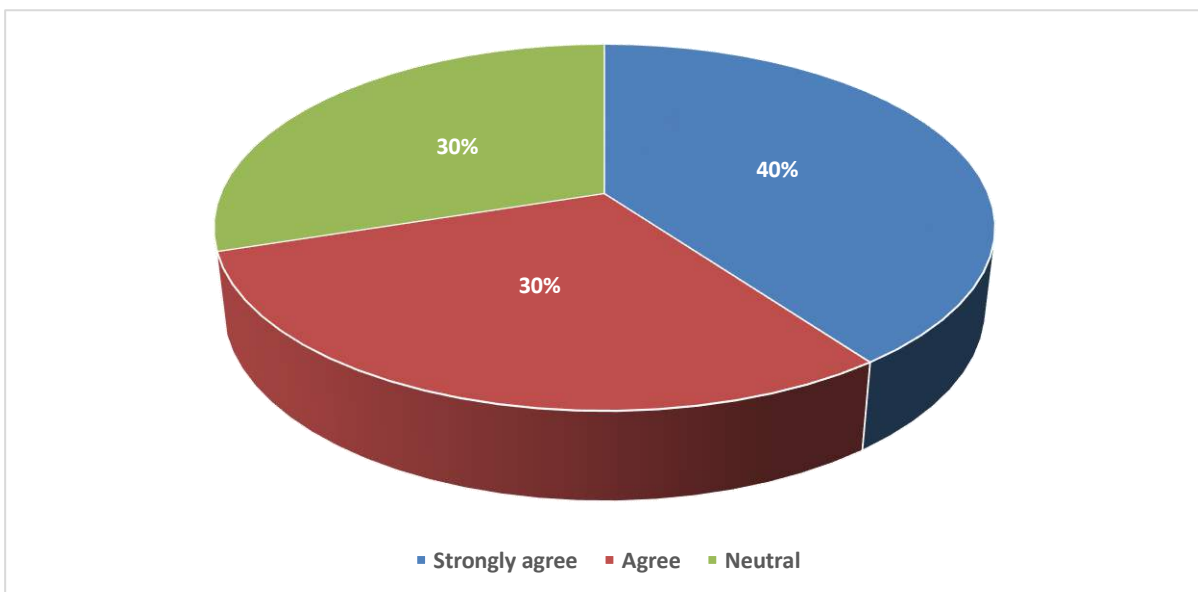
Statement 5:

Learning materials helped me to comprehend the theoretical aspects of blockchain technology.



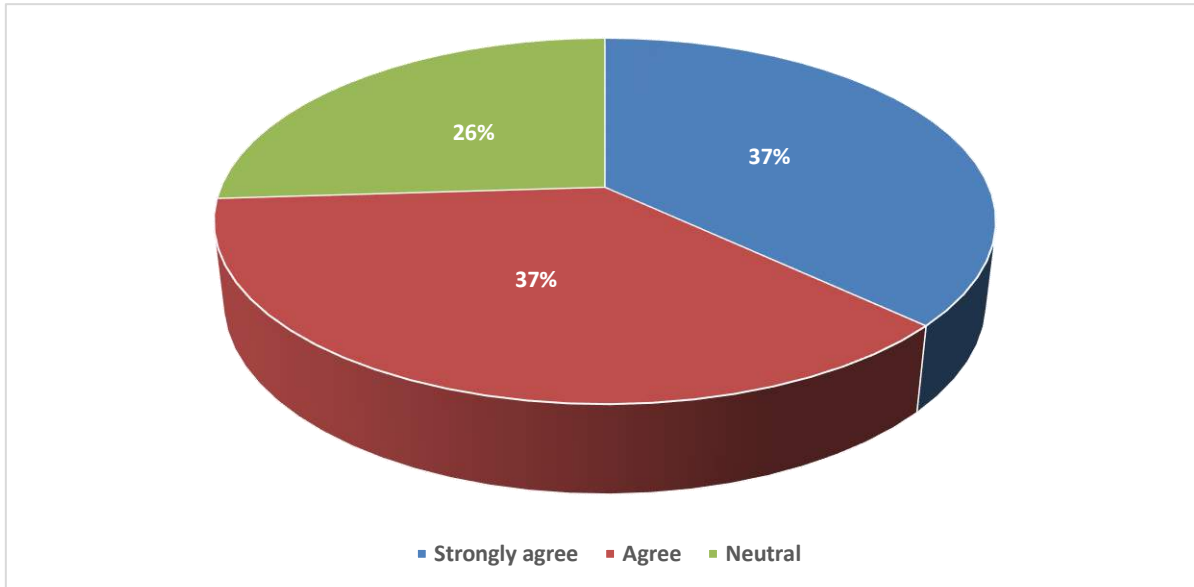
Statement 6:

Learning materials helped me to comprehend the practical applications and innovative possibilities that blockchain technology introduces



Statement 7:

I found that the BLISS course corresponds to post – secondary level educational competences.



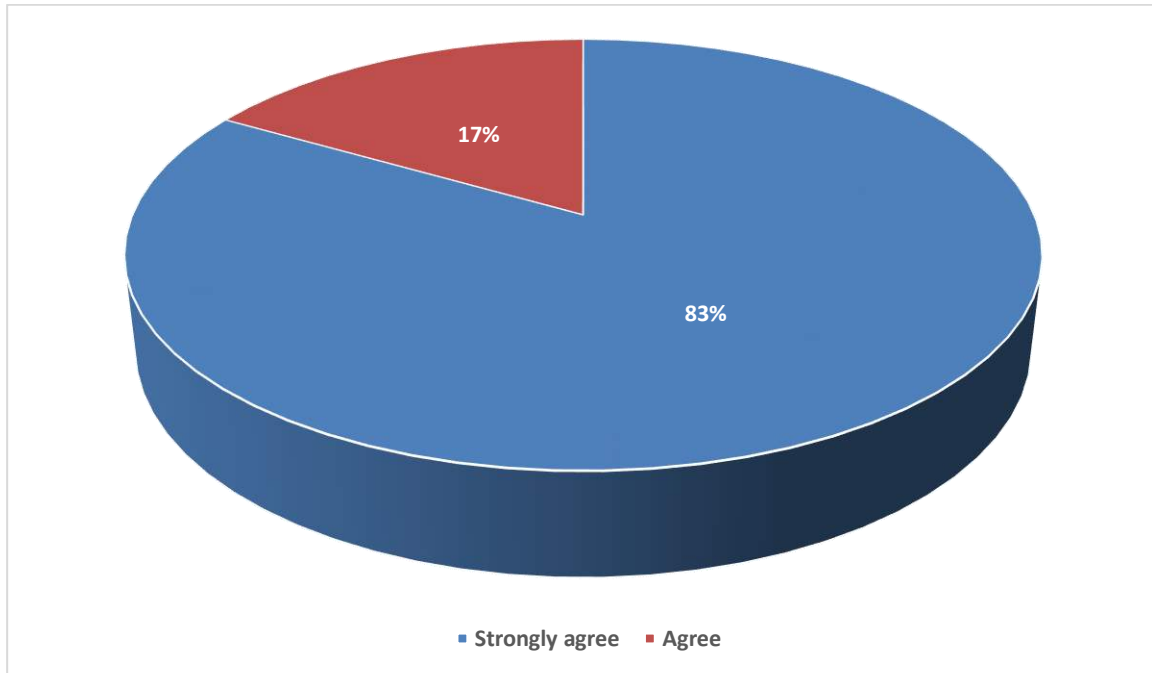
3.5 Technical operation

The rating of the basic VOOC functions aim to rate how operational and easy to understand and use these features are. The question posed was: "When thinking of your experience with the BLISS vocational open online course, how much do you agree/ disagree with the following statements? "The following graphs present the percentages of the responses that were collected to the six main statements regarding technical operation.



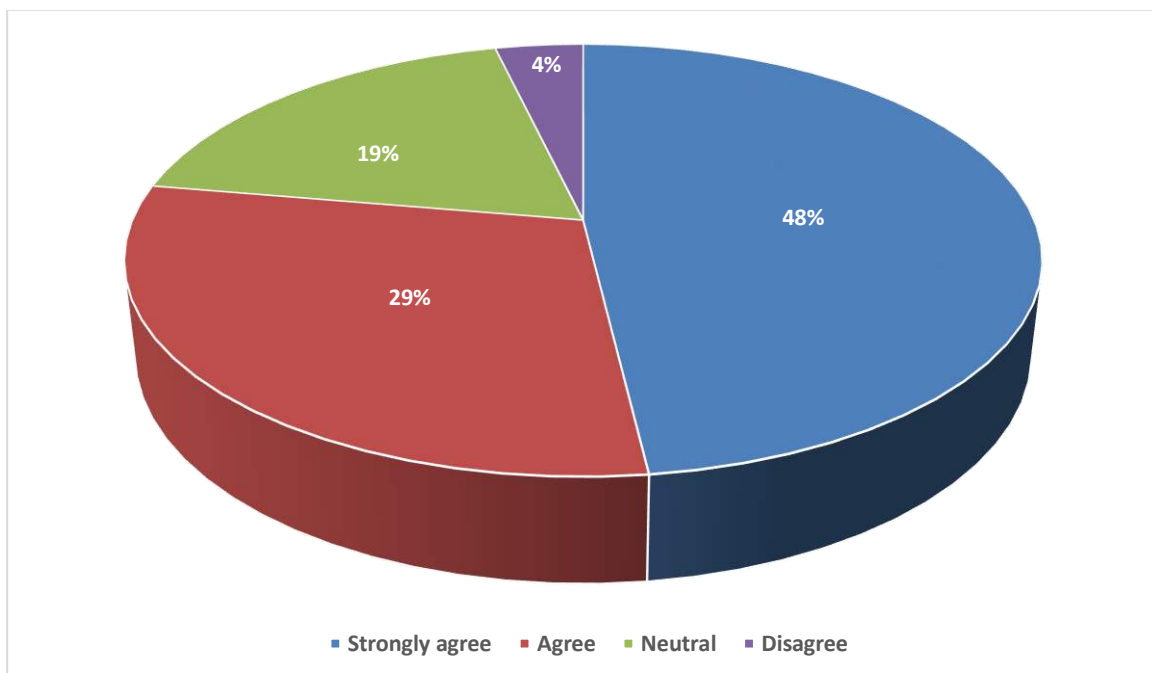
Statement 8:

Registering for the course was quick and easy.



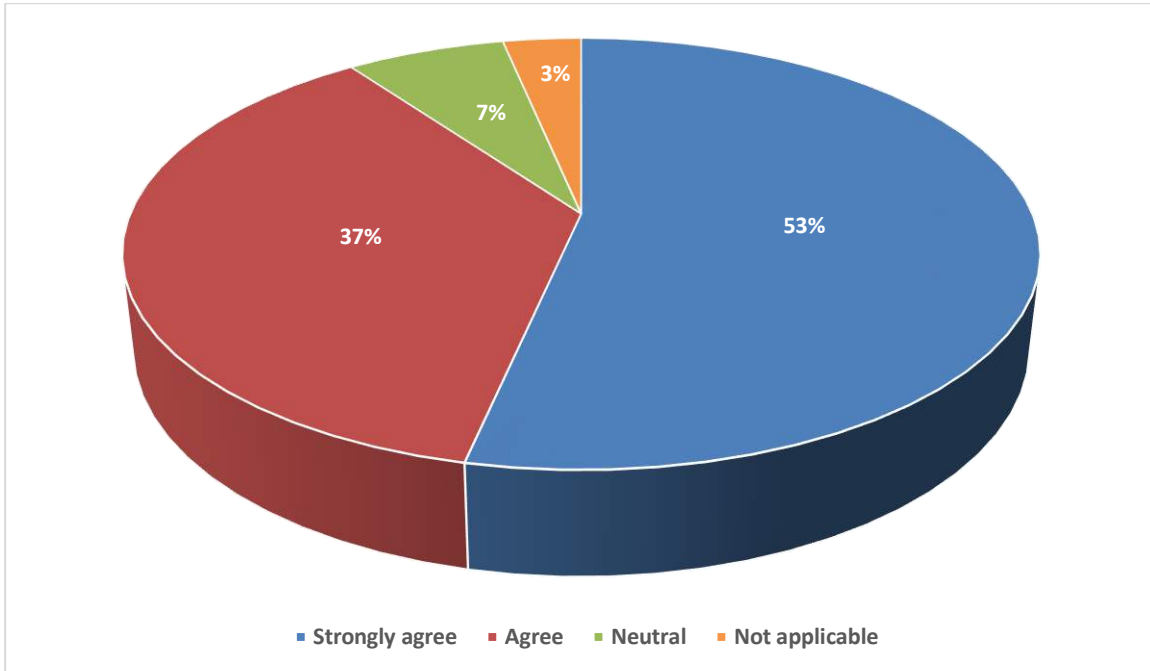
Statement 9:

Pages were loading fast.



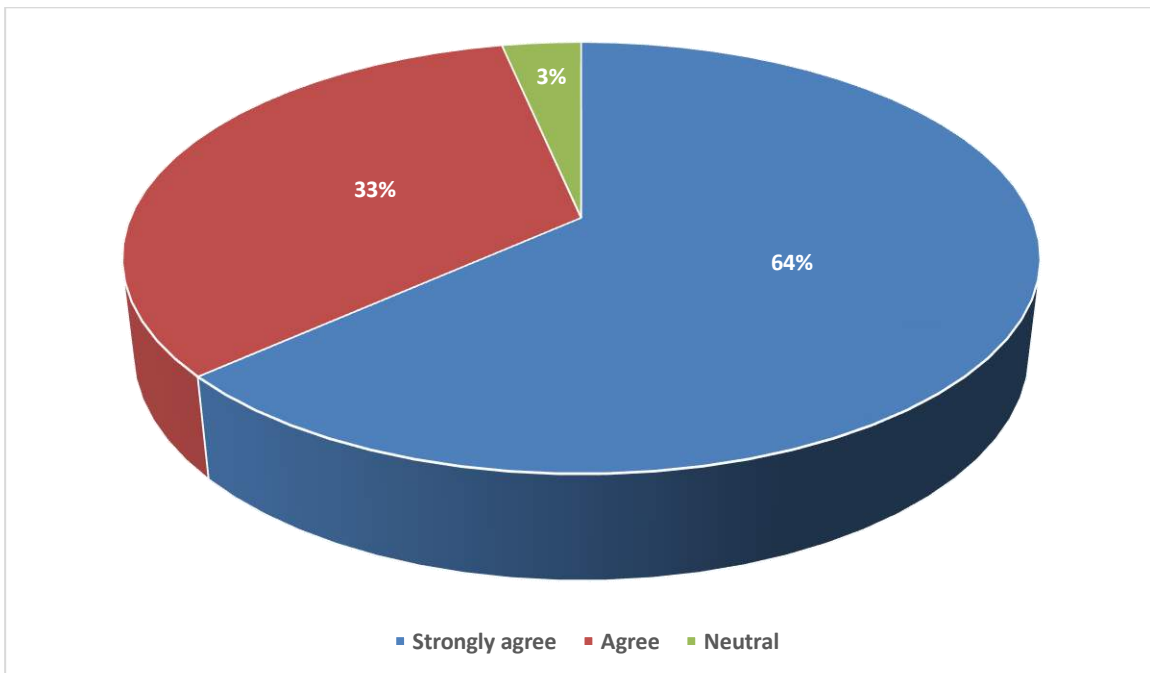
Statement 10:

External links were always working.



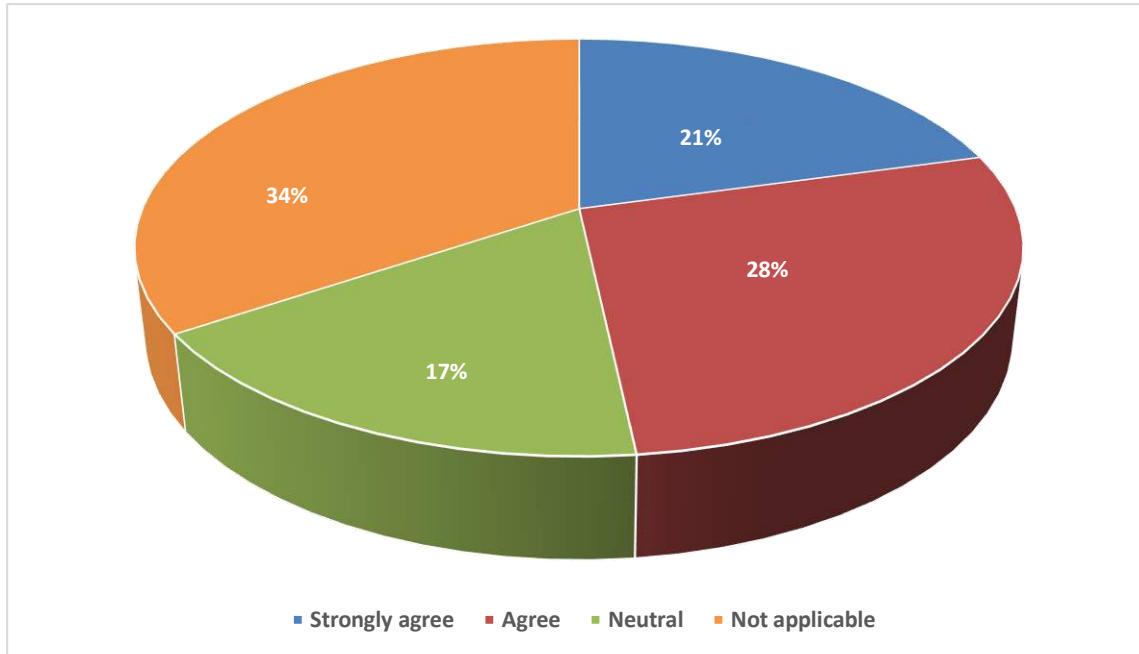
Statement 11:

Embedded, external content (e.g. YouTube videos) was working flawlessly.



Statement 12:

Access through mobile devices is easy and convenient.

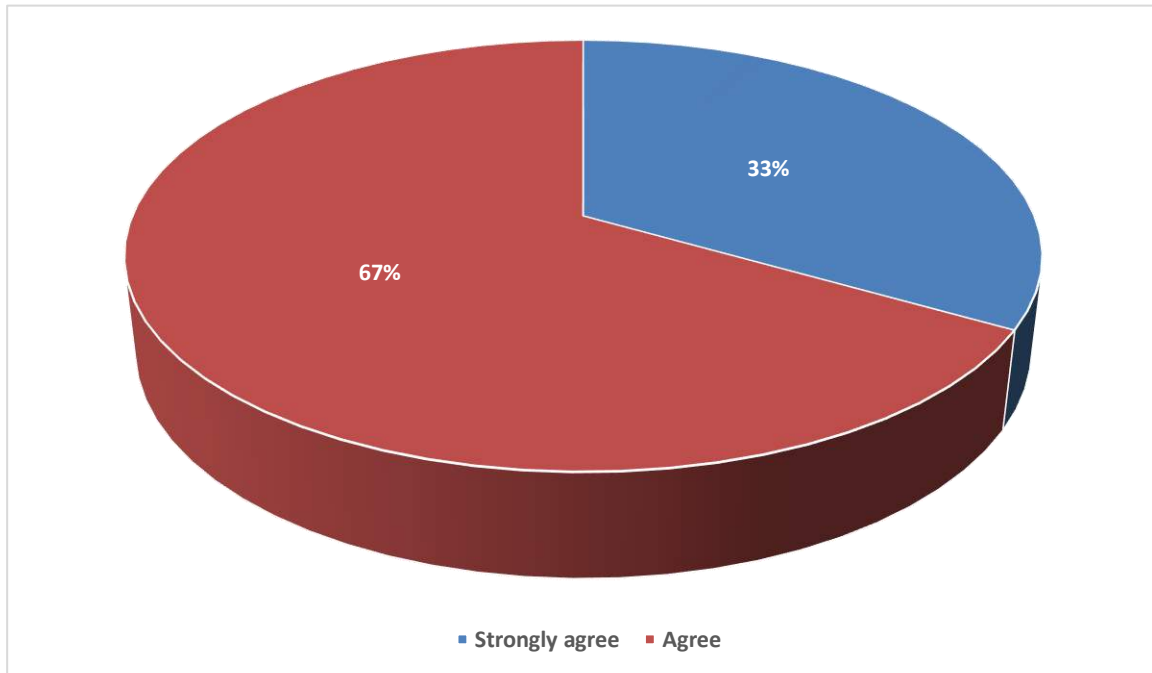


3.6 Usability and visual design

The rating of the usability and visual characteristics of the course aim to rate how user friendly and eye-pleasant these features are. The question asked was: "When thinking of your experience with the BLISS vocational open online course, how much do you agree/ disagree with the following statements?" The following graphs present the percentages of the responses that were collected to the four basic statements regarding usability.

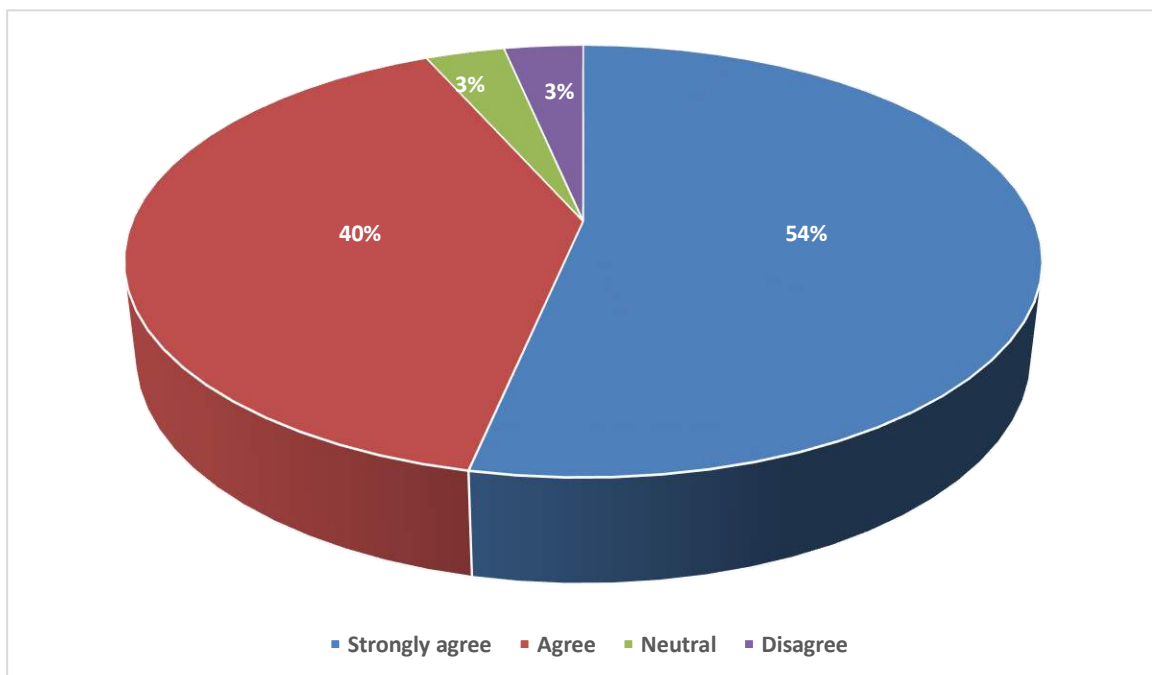
Statement 13:

I found that the course offers a variety of content (e.g. interactive content), different to texts and reading material.



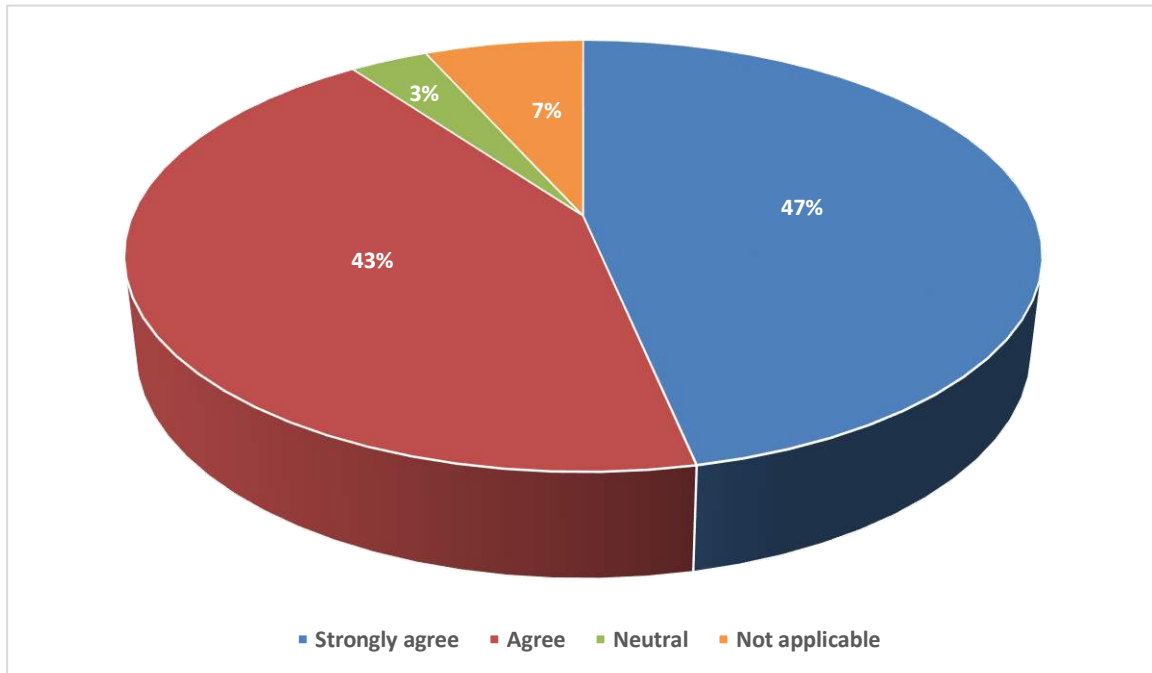
Statement 14:

I was able to easily navigate through the online course.



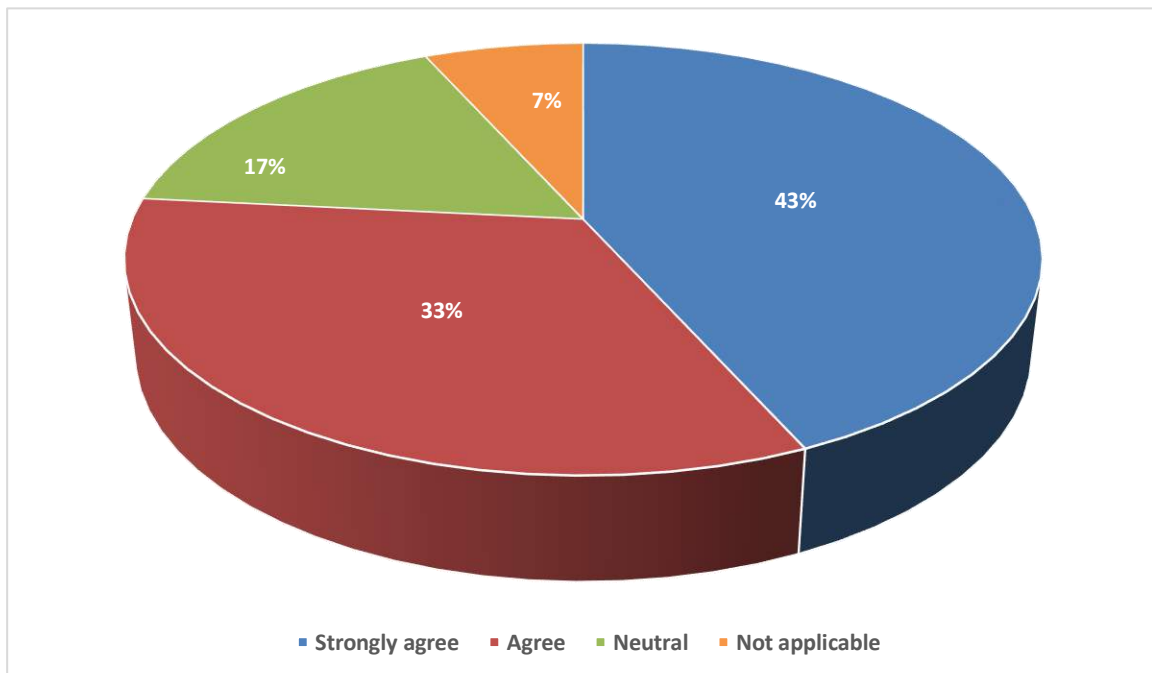
Statement 15:

Descriptive materials (instructions and guidelines) helped me to understand how to use the online course.



Statement 16:

The visual design of the course was appealing to me.

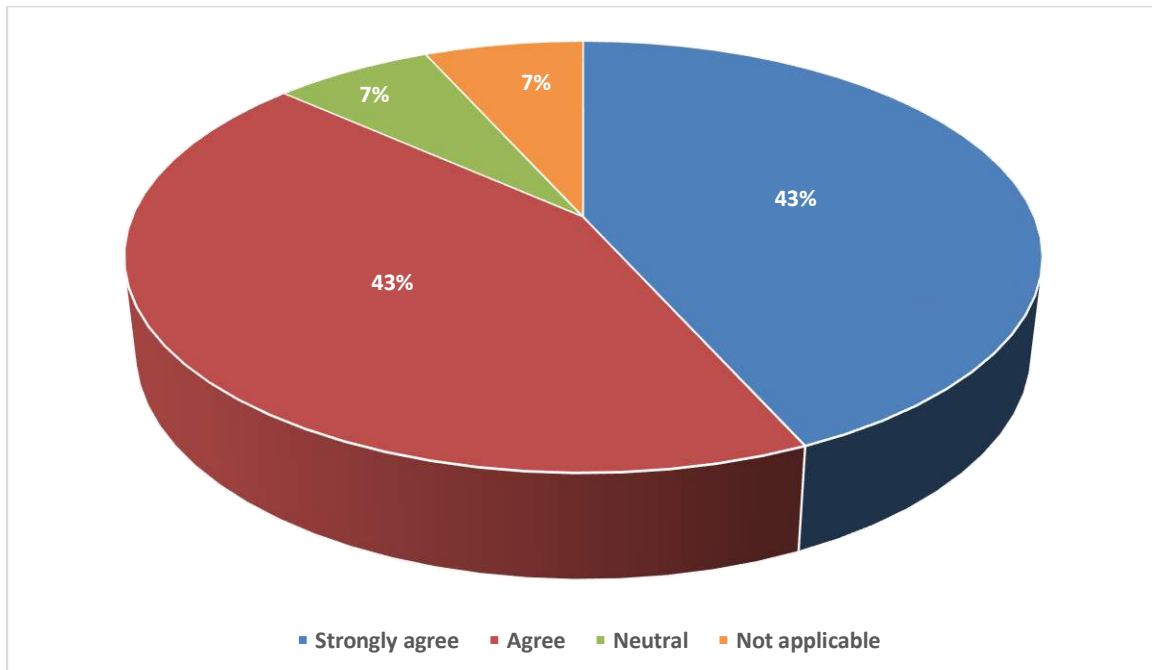


3.7 Communication and interaction issues

The rating of the communication and interaction issues of the course aim to lead to an understanding of how operational the communication mechanisms of the course are. The question asked was: "When thinking about how others would use the BLISS online course, I think that..." The following graphs present the percentages of the responses that were collected to the four basic statements regarding usability.

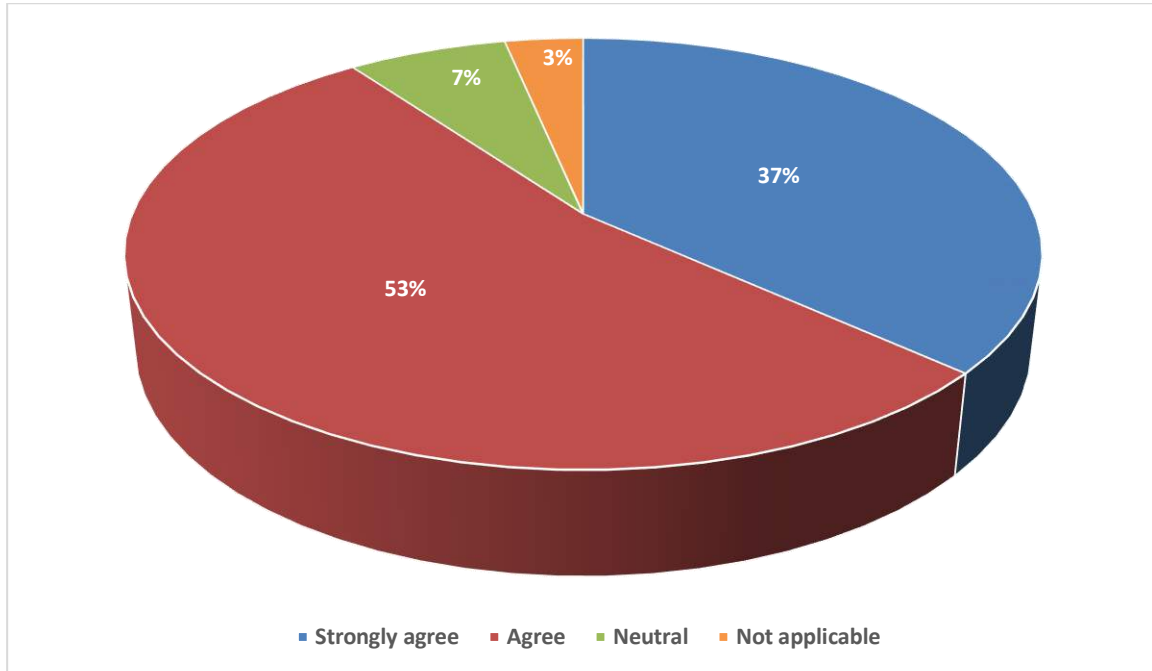
Statement 17:

The online course provides adequate communication mechanisms to enable participants interact and share knowledge.



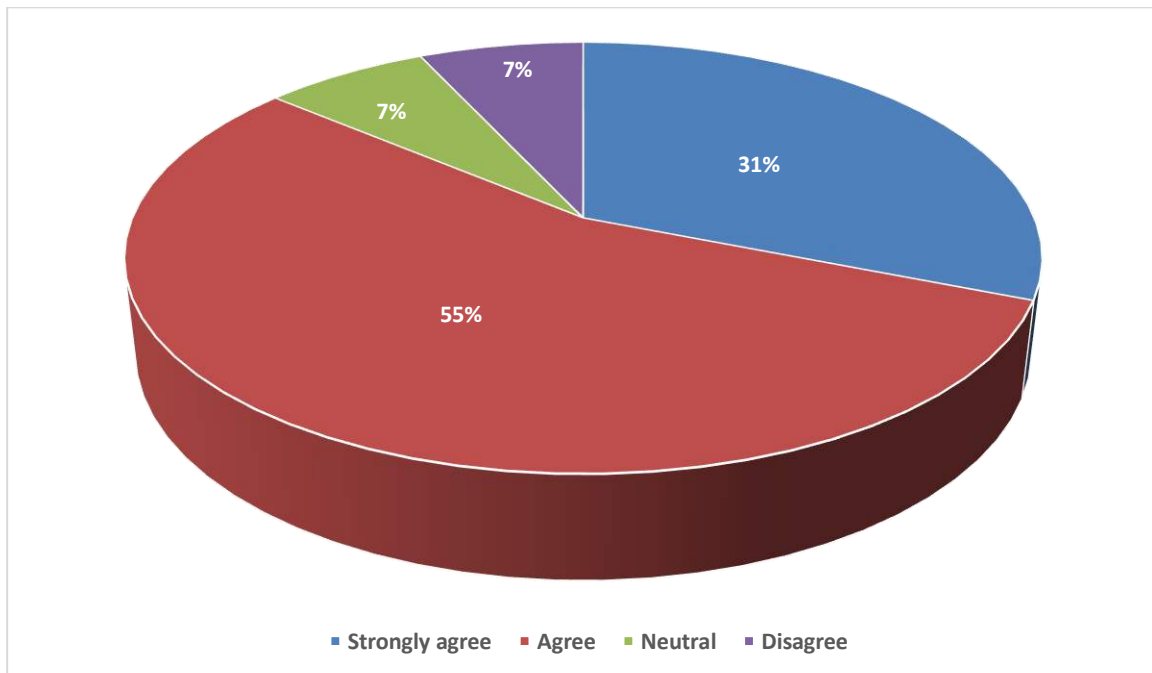
Statement 18:

The course provides adequate information to learners on how to communicate with facilitators.



Statement 19:

The available mechanisms enable the efficient communication and interaction between facilitator and learners.



3.8 Suggestions

Respondents were asked about the aspects of the online course that could potentially improve and were called upon giving examples. Approximately 20% of the respondents suggested the use of more videos, less text (e.g. shorter assignments) and more explanations, as they stated „Courses should be "richer" in examples and real case paradigms" or suggested more practical exercises particularly in the second half of the course.

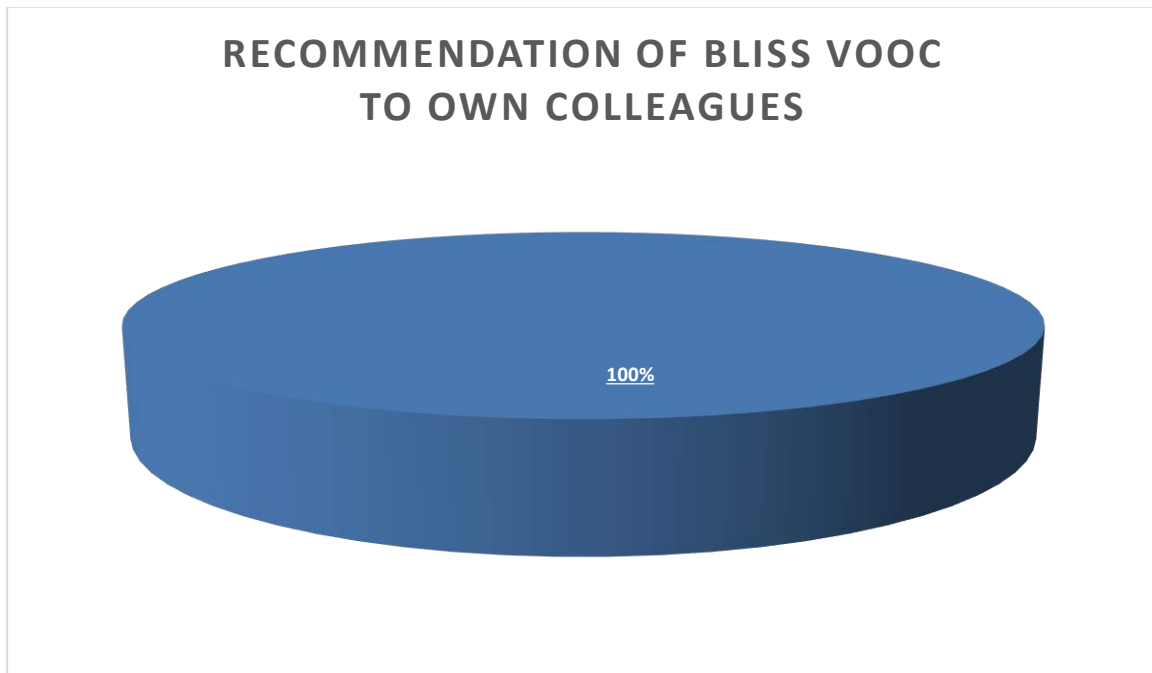
Furthermore, another common request amongst respondents was the communication between the facilitator and the learner in order to clarify any points directly, thereby making the learning process more efficient for the learner. With regards to content, a number of interesting suggestions were made, the most significant of which was the addition of a „Video tutorial to create and deploy the Digital Certificate should be improved because it contains the deployment information for only linux users, there must be information about how to deploy Digital Certificate in Windows".

The pilot-run also gave us the opportunity to identify immediate points of improvement (e.g. minor spelling mistakes during the creation phase) which assisted us to improve the overall quality of the course.

Nevertheless, approximately 17% of the respondents were absolutely happy with the way BLISS VOOC is and would not change anything. The **annexed table 5** demonstrates the actual answers received in the relevant question.

3.9 Recommendation of the course

The respondents were asked whether they would recommend the online course to their colleagues and friends. Unanimously, all respondents (100%) declared that they would recommend the course to their colleagues and friends. **The annexed table 6** summarises the answers received in this question.



4. LIMITATIONS

Participation in the pilot-run itself, had a high response rate with a total of 164 participants however, the number of survey responses included in the analysis, in proportion to the number of participants in the pilot-run was overall lower than anticipated. This small sample may potentially affect the reliability of the results which in turn may lead to bias conclusions. Additionally, some target groups may be underrepresented. More specifically, the majority (nearly 50%) of participants were students, while VET providers and field experts, each representing 7% respectively. On the other hand, ICT professionals were the second best represented group, and consist of the project principle target.

The main reasons for the limited response rate was partly due to the short time period during which participants were asked to contribute to the online survey and furthermore due to the limitations of the GDPR regulation. However, as discussed and verified between partners, these response rates are expected in this type of VOOC surveys.

Nevertheless, given that current and future ICT professionals, constitute the project's main target groups, and that the majority had relevant expertise with online training, overall the results provide us with a valuable insight of the participants' evaluation and opinion on the course.

5. CONCLUSIONS

The main objective of the pilot was to test a limited but key set of technical aspects against specific criteria of usability, including the rationale behind the participation in the VOOC, the user expectations, the user experience with certain technical characteristics, effectiveness and impact of the course. Additionally, the pilot run survey asked the participants to make suggestions with regards to improvements to the course. The results and findings of this pilot run (in terms of scope and the number of respondents), which was conducted for four weeks, have been complemented by live VOOC course run, in November and December, during the demonstration workshops (the results of which are presented in the O5-T1 Validation report).

The pilot's findings, as shown in more detail in Chapter 3, confirmed the usability of the online course, verifying that both ICT professionals and potential ones can be enrolled to the course and acquire a complete set of knowledge and skills by following the sequence of the course. Overall very positive feedback was received from respondents. It was observed that both the technical aspects of the course were both easy and fun to use, while the users felt comfortable enough to make few suggestions on how improve the visual and contextual aspects of the course. This was particularly useful, allowing for some relevant observations and considerations to be made. Based on the expectations and targets outlined in the BLISS Application Form, the BLISS VOOC will reach its final stage, when the few suggestions and recommendations received during the pilot run, will be adapted to the final English version of the course.



6. ANNEXES

Table 1: Target groups of the survey

A.	Target groups	No. of respondents	Percentage
a	Partner's staff (not involved in the project)	4	7,14%
b	ICT professional	7	25,0%
c	VET provider	2	7,14%
d	Field expert	2	7,14%
e	Other (please specify)	15	53,58%
	<i>ICT teacher secondary education</i>	1	
	<i>Student</i>	14	
	<i>Software engineering student</i>	2	
	<i>ICT management student</i>	12	
	Not completed (% in total)	132	Appr. 75%

Table 2: Previous participation in an Open Online Course

B.	In how many Open Online Courses have you participated?	No. of respondents	Percentage
a	This is the first time I attend/take an Open Online Course	9	25%
b	1-3 times	9	32,14%
c	More than 3	11	45,84%

Table 3: Rationale behind VOOC participation

C.	Why did you participate in the BLISS Vocational Open Online Course, and which were your expectations?	No. of respondents	Percentage
	Answer	28	100%
	<ul style="list-style-type: none"> ➤ <i>Interesting current topic.</i> ➤ <i>I did not have any knowledge of blockchain previously, so my expectations were not high.</i> ➤ <i>I'm interested to learn more about blockchain technology. My expectation, I can sharpen my knowledge in blockchain and getting blockchain-related job</i> ➤ <i>to learn more about blockchain</i> ➤ <i>I was highly motivated related to Block Chain technology, and I'm very glad to have this course online with the very interactive and informative lecture, videos and reference links, from where I get more detailed knowledge.</i> ➤ <i>I needed to understand Blockchains and digital currency related stuff.</i> 		

- *Learn more about blockchain technology and its applications*
- *I wanted to learn about the blockchain application building and see how course for blockchain technology could be prepared.*
- *I was interested in blockchain*
- *I wanted to learn about the blockchain technology*
- *To learn more about Blockchain, get basic knowledge for my future thesis topic*
- *Completion of ECTS requirements and to gain academic insight about the field of blockchain.*
- *I was interested in Blockchain technologies and did some study on it while choosing my thesis topic. I was expecting that this course is designed in a that would help*
- *Blockchain technology is interesting and I wanted to know more about it*
- *I wanted to learn how blockchain works?, why blockchain? what is blockchain?, how cryptocurrencies (mainly bitcoin and Ethereum) use blockchain technology*
- *I'm interested with blockchain technology, and expect to gain the basic knowledge about it with a plan to advance it later*
- *I wanted to learn more about blockchain technologies*
- *I was curious about blockchain. In our program the topic is uncovered. I expected to reach better understanding of the use and logic of the technology.*
- *I wanted to really understand the new blockchain technology*
- *Do know basic of BlockChain*
- *Searching for the course material related to blockchain for learning purposes. So, this course was a cherry on the cake for me.*
- *to learn about block chain and its architecture*
- *To learn more about blockchain technology*
- *Didn't know much about Blockchain and hoped this will finally get me through this topic*
- *I wanted to understand how the blockchain technology works and obtain a certificate*
- *Because the Blockchain technology is interesting to me and I wanted to know more about it.*
- *I have a constant interest in new ICT developments and I would like to attend a new course on blockchain technology.*
- *To learn about the opportunities blockchain technology can bring to our workplace*
- *Interesting current topic.*

Table 4: Expectations from the course

D.	Did the course meet your expectations? Please explain.	No. of respondents	Percentage
	Answer	30	100%
	<ul style="list-style-type: none"> ➤ <i>Yes it did, now I know all the concepts of blockchain technology</i> ➤ <i>Yes, the course explained the blockchain technology and I gained new knowledge.</i> ➤ <i>In fact, the course exceeded my initials expectations regarding the quality of learning materials, and the course of learning activities within the online course.</i> ➤ <i>overall yes, however i would have like to have further demonstrative videos and practical exercises</i> ➤ <i>Definitely. It was very well prepared.</i> 		



- *I gain information about the topic, but I think there could have been more explanations in some parts*
- *Yes, I just started the first chapter and learn some new term in blockchain such as sidechain, ethereum, and so on*
- *Yes*
- *Its very explanatory, the best thing is the animated videos which explained each topic with visualization that is not forgettable.*
- *I think the material was extremely "compressed". Therefore several matters remained "terra incognita" to me.*
- *Yes, now I understand how the blockchain technology works and why we use it*
- *Yes. I learned about the blockchain application building and saw how course for blockchain technology is prepared.*
- *Yes, I start to understand better the technology now*
- *Mostly yes, I've got basic of Blockchain and Smart contracts, which give me a full view of these.*
- *I am neutral about this because the course happened to have more information than expected for a 3 ECTS course making it overwhelming to sift through the contents of the course. My recommendation would be to either reduce the merge the content of the materials or increase the credit load allocation to annul for students' expectations about the amount of effort needed during the course.*
- *Yes! the course is designed in a way that it exactly met my expectations and even more. Concepts are explained very well and in simpler ways. From blockchain intro to understanding smart contracts, transactions, ethereum network and ledgers and more concepts and even setting up an environment, the information is aligned in a way that there is no confusion.*
- *Yes, The various topics are explained quite well and it is quite interesting course.*
- *Yes. Course has very well structured. So it made me urge to study.*
- *Yes, it gives me some basic knowledge about blockchain and how it works.*
- *materials would have been sufficient to answer the questions. Materials provided in video format were great. That should be leveraged.*
- *Absolutely. I learned the variety of fields it could be used. Also the course gave the opportunity to dig deeper, to the level of starting your own machine.*
- *Yes, course is designed in a manner that it is explaining the content in very detail. I can easily say that i liked the course*
- *Yes*
- *Off-course yes, because it has given me the detailed knowledge regarding Crypto-Currency, Blockchain, Decentralization and specific information about ethereum.*
- *Yes*
- *yes, but i thought there would be more emphasis on explaining blockchain rather than the theory of it*
- *Not exactly, I have the overall view about Blockchain and understanding why it's needed but technical description was too complicated for me.*

Table 5: Improvements to the course

I. What aspects of the online course should be improved? Please, give examples.	No. of respondents	Percentage
Answer	30	100%
<ul style="list-style-type: none"> ➤ <i>I believe that videos should have subtitles in English because sometimes it was a little difficult to follow the speaker</i> ➤ <i>More video materials and explanations</i> ➤ <i>Learning materials for Units 2 and 3</i> ➤ <i>more practical exercises particularly in the second half of the course</i> ➤ <i>Maybe more interaction between members in the forum so to exchange ideas more efficiently.</i> ➤ <i>The writing tasks were too long, I think it was out of balance that you look at some videos and then take one long assignment. Maybe some intermediate test or something would help make sure that people understand the first step before continuing.</i> ➤ <i>Regular webinar session for student and teacher to discuss together about the online course topic</i> ➤ <i>I cannot think of any</i> ➤ <i>well according to me it is very good, but the information regarding implementation and deployment of Smart Contract was a bit difficult to follow due to working in Linux. The tutorial should cover cross platform deployment.</i> ➤ <i>Courses should be "richer" in examples and real case paradigms. The whole material should be more lengthy.</i> ➤ <i>I have nothing to suggest, everything was fine</i> ➤ <i>Definitely communication!!! Especially between the facilitator and learners</i> ➤ <i>Perhaps more videos</i> ➤ <i>Everything was good, maybe put more examples</i> ➤ <i>Better description of assignment and/or tasks. For instance, in the practical exercises for Learning unit 2 , it was difficult to understand what had to be done.</i> ➤ <i>I would say that, lesser theoretical content and practical content. For example, after explanation of one concept there could be a slide with one multiple choice question that help learner in understanding that if he/she has understood the concept clearly.</i> ➤ <i>More short videos, they are good to look at and give you a better view</i> ➤ <i>To the best of my knowledge this online course is very well structured. But in some slides I found some spelling mistakes which gave confusion while studying. But those are minor mistakes.</i> ➤ <i>Regular webinar session between teacher and student, once or twice a month</i> ➤ <i>More materials should be given in text format (currently there were random pictures in the powerpoint and learner had no idea how to interpret those). Questions asked in the end of module should have answer within the materials provided. It is nonsense to google single answer for 3 hours. (i literally did it). It should be clearly communicated at start that learner don't have to follow specific path (module 1--> module 2 etc.) If it is necessary then more external links with relevant information should be provided so that learner don't have to google information by themselves.</i> <i>Task in which we had to make our own etherum programm should be rewored so that it would be easier to understand for people without any blockchain background. Currently i used my friends help and still spent multiple hours to find an answer to that task. Maybe step-by-step material would be better.</i> ➤ <i>All good!</i> 		



- *I think course is very well designed and only changes i would recommend is going through the vocabulary of the content, there are few spelling mistakes.*
- *Reading slides can be boring sometime. So we can visualise them too.*
- *Video tutorial to create and deploy the Digital Certificate should be improved because it contains the deployment information for only linux users, there must be information about how to deploy Digital Certificate in Windows As well.*
- *It is great with respect to learning but navigating to next section is not user friendly (website design problem). Other than that, program is excellent for learning.*
- *to keep its effort limited to the promised 3 credit hours, not more.*
- *Took the course that was in Estonian and it was full of grammar and logic mistakes so it was really hard to follow. Also one video had really bad sound quality. I liked the multiple choice questions although sometimes couldn't understand what was asked due to grammar mistakes and sentences seemed incomplete. After second submit it would have been nice to see all the correct answers. Really liked the videos! Slides where uncomfortable to read and there was a lot of repetitions.*

Table 6: Recommendation

J. Would you recommend the BLISS online course to your colleagues and friends?		No. of respondents	Percentage
	Answer	30	100%
a	Yes	30	100,0%
b	No	0	0,0%