eHealth4all@EU

Interprofessional European eHealth Programme in Higher Education

IO6: Evaluation

Kaija Saranto[c], Johanna Ikonen[c], Tiina Haukkakallio[c], Ulla-Mari Kinnunen[c], Birgit Babitsch[b], Ursula Hübner[a], Nicole Egbert[a], Pedro Vieira-Marques[d].

Lead: University of Eastern Finland[c]

Cooperation: Osnabrück University of Applied Sciences[a]

Osnabrück University[b]

University of Porto[d]

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- Osnabrück University, New Public Health Research Group
- University of Eastern Finland, Research Group of Health and Human Service Informatics (HHS)
- University of Porto, Centre for Health Technology and Services Research (CINTESIS)

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Kuopio, January 2023

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Abstract

IO6 is a report of the evaluation of the online courses and Summer School. The project plan of eHealth4all@EU guides the evaluation. The aim of the evaluation is to present the strengths and developing parts of the project. The main evaluation themes are eHealth, inter-professional education, and problem-based learning. For the funder's perspective, evaluation focusing themes of digital support, lifelong learning, an active citizen, and the future. Evaluation of the project assign around all these themes and will find out students' and teachers' feelings of satisfaction, efficiency, and quality of the learning experience.

1 Introduction

This output will give proof of the lessons learnt. It will show the strengths, weaknesses and limitations of the approach proposed. It is thus highly valuable for the persons and institutions who have similar plans outside of the eHealth4all@EU consortium. eHealth4all@EU will contribute to the learning needs of graduate students in higher education and professionals in the health workforce across Europe. It has the potential not only to introduce eHealth into the world of health professionals but also to enhance and transform patient care and health service delivery in the future. Thus, the evaluation report gives insights into our programme showing how healthcare professionals and to be healthcare professionals see inter-professional cooperation.

O6 will show the overall short-term effect of the inter-professional European eHealth Education programme seen through the lens of the students and the teachers. This approach allows us to reach very detailed conclusions at a high level of validity. The long-term contribution of eHealth4all@EU will be to improve adoption and use of technology in healthcare through increased communication and coordination between different groups of professionals to enhance care delivery.

2 Methods

Tasks, milestones and schedule of IO6 are presented below.

Tasks

WP01 - IO framework draft, work plan and team briefing

WP02 - Develop evaluation concept for learners (internal)

WP03 - Develop evaluation concept for teachers / consortium (internal)

WP05 - Run evaluation on 1st cycle of online courses and summer school

WP06 - Analyse internal evaluation results after 1st cycle

WP07 - Run evaluation on 2nd cycle of online courses and summer school

WP08 - Analyse internal evaluation results after 2nd cycle

Milestones

M1 - Internal (learners and teachers) and external evaluation complete and prepared for implementation

M2 - Internal and external evaluations of 2nd pilot run have been conducted, results analysed and discussed

M3 - Final evaluation report completed, incorporating results from the 2nd pilot run

3 Results

In this IO, the following documents have been provided (Table1). These documents include surveys, results. The report summarizes all the results.

Table 1: Documents in IO6

Milestone	Topic (author of document)	Document
M1 - Internal (learners and teachers) and external evaluation complete and prepared for implementation	Data analytics (Osnabrück UAS)	Pre-questionnaire
		Post-questionnaire
		Course cancellation
		Results
	Data Protection and Security (UEF)	Pre-questionnaire
		Post-questionnaire
		Results
	Interoperability (UP)	Pre-questionnaire
		Post-questionnaire
		Results
M2: Final evaluation report completed, incorporating results from the 2nd pilot run	Summer school (UEF and Osnabrück university)	Questionnaire
		Results
M3: Final evaluation report completed, incorporating results from the 2nd pilot run	Evaluation (UEF)	Questionnaire for students
		Questionnaire for teachers
		Results
		Report

4 Conclusion

The main result is participants' positive feedback for the project. They agree of the importance of eHealth and eHealth education in Europe now and in the future. Each of the educated topics are vital and linked together. Based on the feedback it can be summarized that eHealth is a complex and broad topic to teach and learn.

Proposals for the future, eHealth education should be continued. Challenges for eHealth education in Europe are differences between countries, health care systems and eHealth solutions. Moreover, citizens need education and support for eHealth. European Health Data Space will be a challenge and opportunity in the future.

Appendix

Nicole Egbert, Jens Hüsers, Ursula Hübner. Evaluation of the course Learning Healthcare in Action: Clinical Data Analytics.

Tiina Jokinen, Johanna Ikonen, Ulla-Mari Kinnunen, Kaija Saranto. Evaluation of the course Learning Healthcare in Action: Data Protection and Security.

Pedro Marques. Evaluation of the course Learning Healthcare in Action: Interoperability.

Johanna Ikonen, Tiina Jokinen, Ulla-Mari Kinnunen, Kaija Saranto. Evaluation of the Online courses.

Johanna Ikonen, Tinna Jokinen, Ulla-Mari Kinnunen, Kaija Saranto. Evaluation of the summer school.

Johanna Ikonen, Tiina Haukkakallio, Ulla-Mari Kinnunen, Kaija Saranto. IO6: Evaluation Report.

Evaluation

Evaluation of the course Learning Healthcare in Action: Clinical Data Analytics

Authors: Nicole Egbert, Jens Hüsers, Ursula Hübner

Osnabrück University of Applied Sciences

Co-funded by the Erasmus+ Programme of the European Union

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1 Introduction

The course “Learning healthcare in action – clinical data analytics” teaches participants how to apply statistical analysis techniques to clinical data. The goal of the course is to show participants how statistical methods and models can be brought together with clinical data to generate new knowledge. In order to transfer this generated knowledge into the clinic in the form of evidence-based medicine, the use of the presented statistical models as decision support systems will be demonstrated. The course aims to convey the content in a practical manner. Therefore, in addition to teaching the statistical methods, clinical data used to build models will be addressed. Furthermore, a focus of the course is a research workshop in which participants independently develop and validate statistical models based on clinical data.

The first run of this online course took place between June 17th and August 25th 2021. There were there phases to the course: Kick-Off Meeting, Self-learning and Virtual European Summer School (see figure 1).

Kick-Off Meeting	Self-learning	Virtual European Summer School
17th / 18th June 2021	19th June – 22nd August 2021	23rd – 25th August 2021
9.00 – 12.00 CET (-1 Portugal / +1 Finland) Online via Zoom	Self-learning via Moodle learning platform	9.00 – 17.00 CET (-1 Portugal / +1 Finland) Online via Zoom

Figure 1: Course design

Two surveys were conducted as part of the course, a pre-survey before the course started and a survey after the course was completed. The aim of the surveys was to determine the quality of the course in order to be able to make adjustments and obtain important findings for revising the course for further implementations. In the pre-evaluation, the expectations and previous knowledge of the participants were also queried in order to be able to react to the needs already during the course.

The results of the pre-evaluation are presented in chapter 2, and the results of the post-evaluation are presented in chapter 3. Chapter 4 includes a pre-post comparison on specific questions.

Some participants dropped out of the course during the learning phase. To determine the reasons for this dropout, a short questionnaire was sent to these participants. The results are presented in chapter 5. All questionnaires can be found in the appendix.

Chapter 6 includes some original quotes from participants in the course.

2 Pre-Evaluation Results

2.1 Experience, motivation and interests regarding the course

Interest in findings of current research

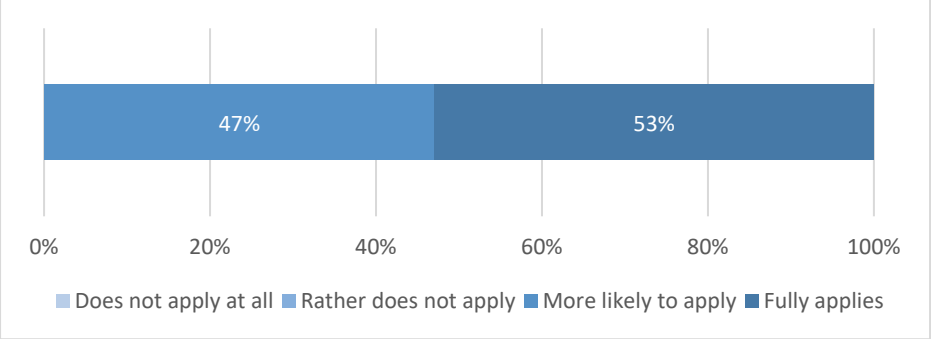


Figure 2: Interest in findings of current reseach [n=17]

Interest in learning new knowledge and/or new methods

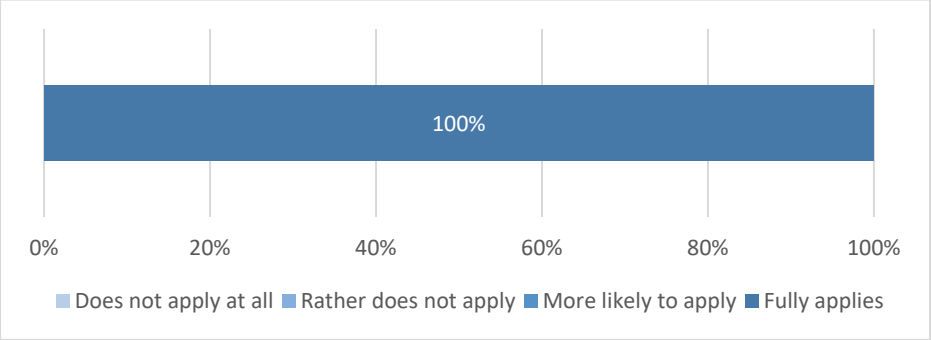


Figure 3: Interest in learning new knowledge and/or new methods [n=17]

Personal development

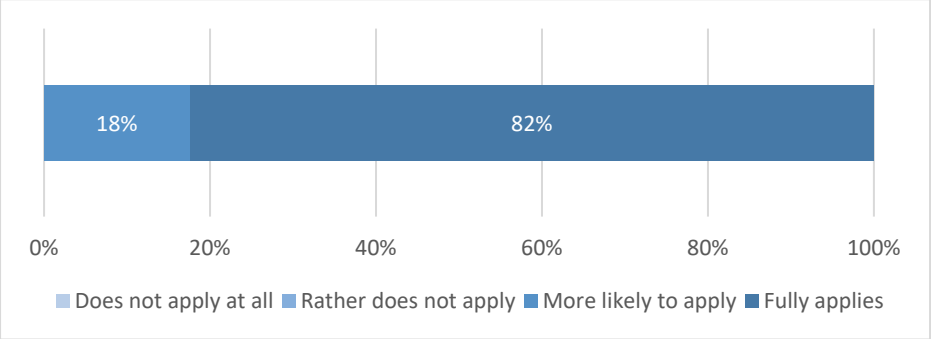


Figure 4: Personal development [n=17]

Desire for (international) exchange with other students

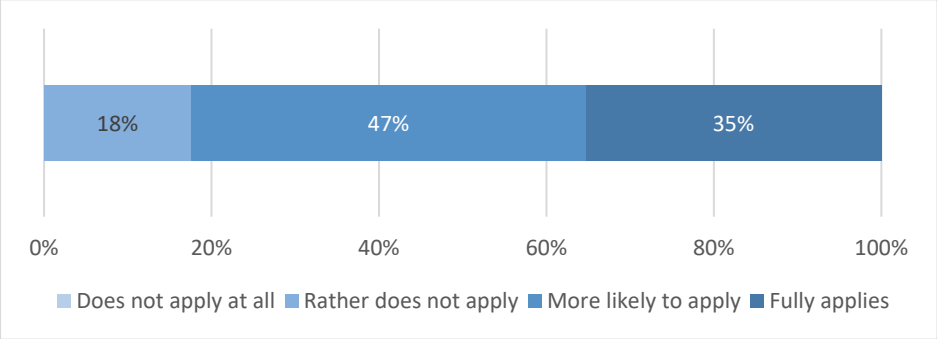


Figure 5: Desire for (international) exchange with other students [n=17]

Interest in (new) methods and tools for the analysis of clinical data

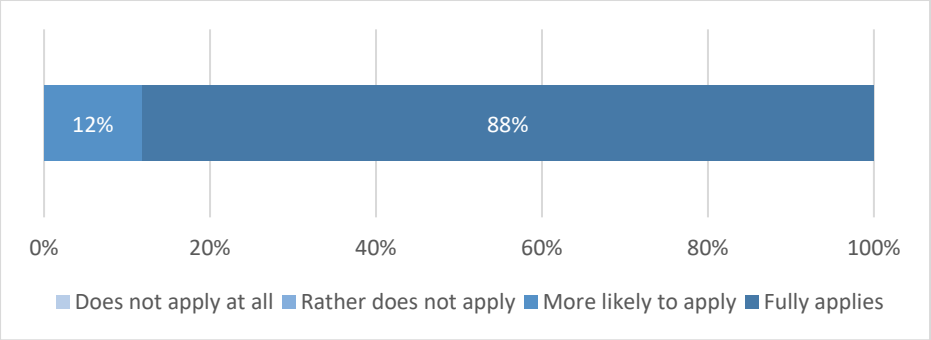


Figure 6: Interest in (new) methods and tools for the analysis of clinical data [n=17]

Learn more about the topic of data analytics

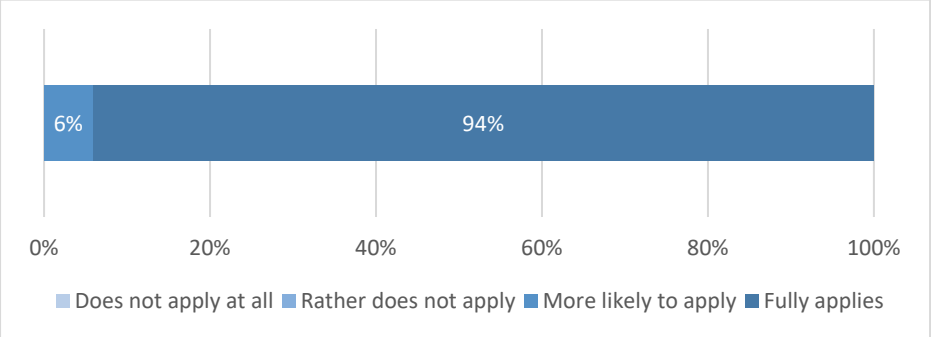


Figure 7: Learn more about the topic of data analytics [n=17]

Other reasons, namely:

- Networking in preparation for postdoctoral training

2.2 Course expectations

I expect from the course, …

… to gain new theoretical knowledge.

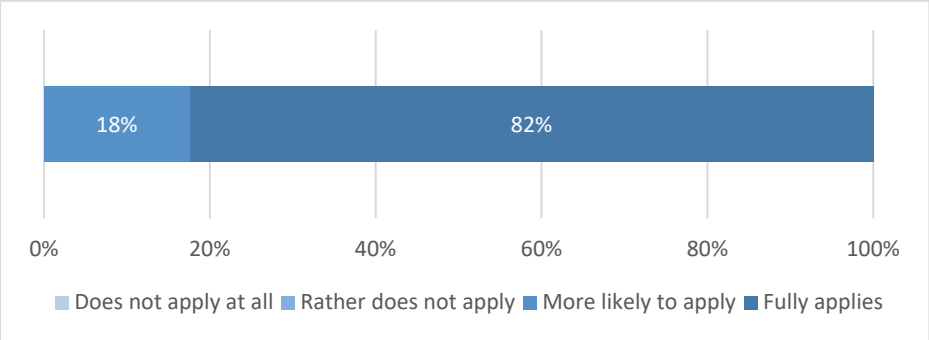


Figure 8: ... to gain new theoretical knowledge [n=17]

… to make new (and helpful) contacts.

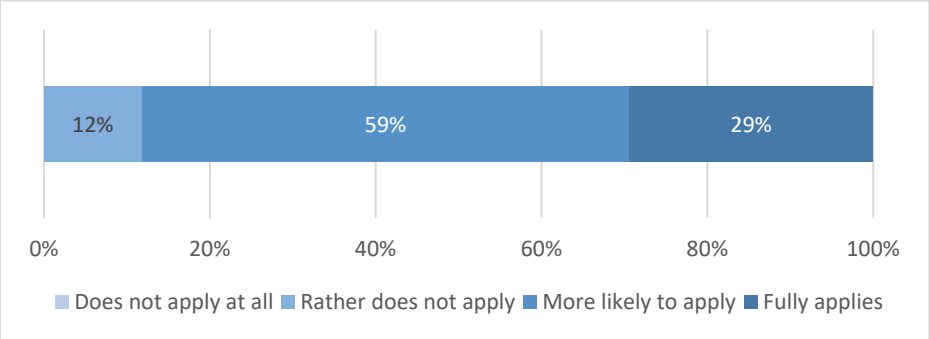


Figure 9: … to make new (and helpful) contacts [n=17]

… to get new knowledge for my studies.

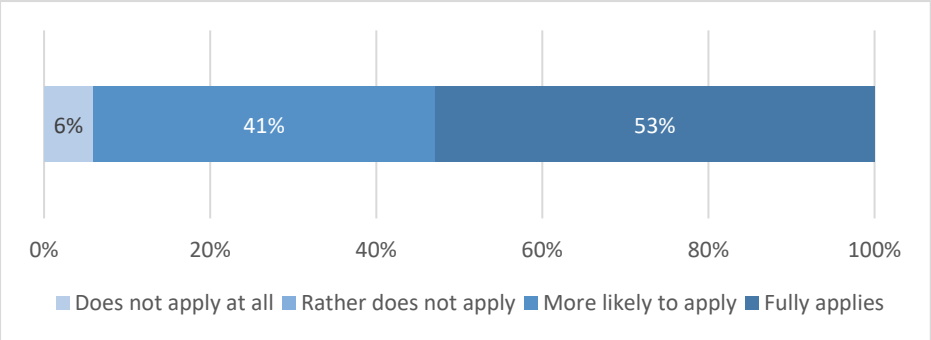


Figure 10: … to get new knowledge for my studies [n=17]

… to receive individual support.

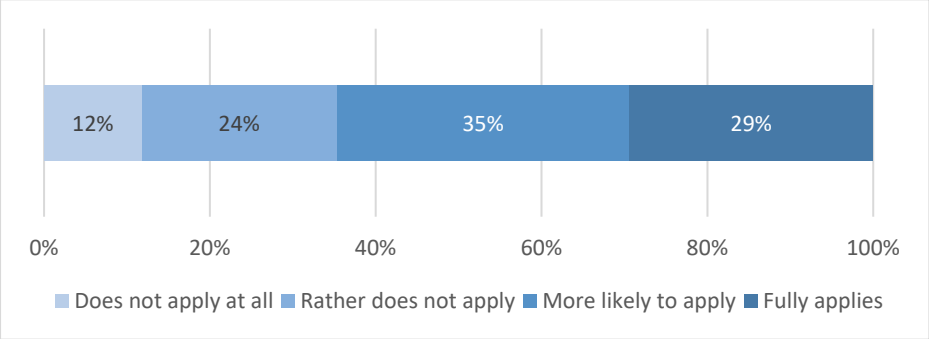


Figure 11: … to receive individual support [n=17]

… to get helpful impulses for my studies.

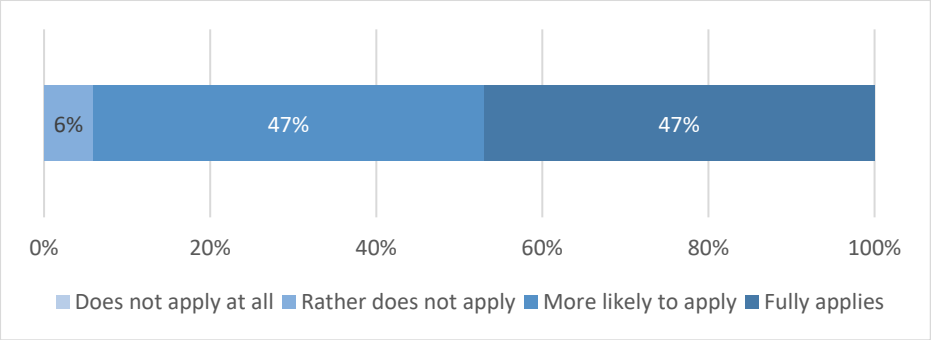


Figure 12: … to get helpful impulses for my studies [n=17]

… to be able to appropriately apply instruments and methods for the analysis of clinical data.

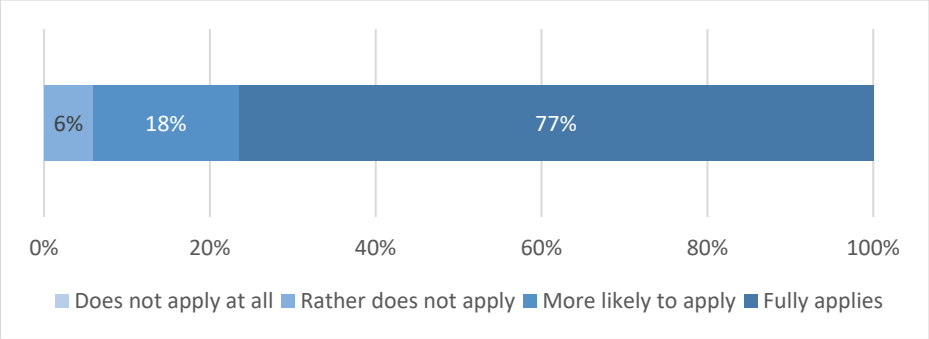


Figure 13: … to be able to appropriately apply instruments and methods for the analysis of clinical data [n=17]

2.3 Prior knowledge of the content of the course: Learning Healthcare in Action: Clinical Data Analytics

I know the characteristics of routine data and different methods of data collection.

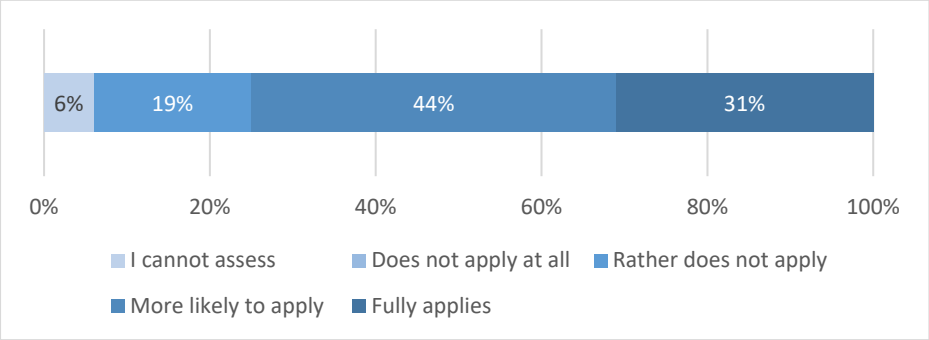


Figure 14: I know the characteristics of routine data and different methods of data collection [n=16]

I am able to list the characteristics and differences between experimental and observational data and categorize clinical data raised in care into this context.

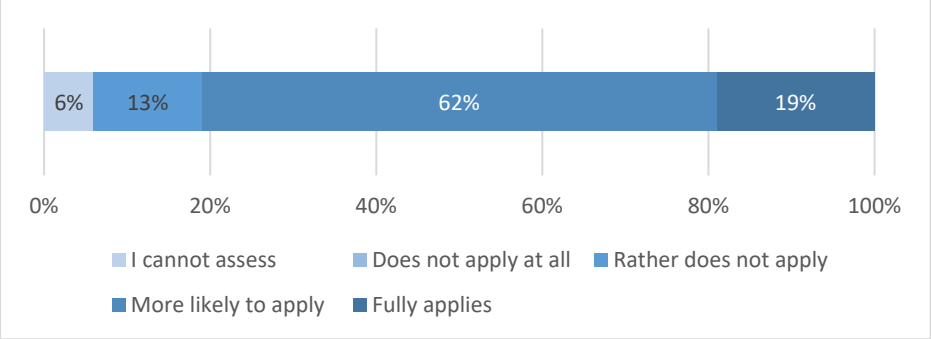


Figure 15: I am able to list the characteristics and differences between experimental and observational data and categorize clinical data raised in care into this context [n=16]

I can define the research design of observational studies, especially retrospective case-control studies.

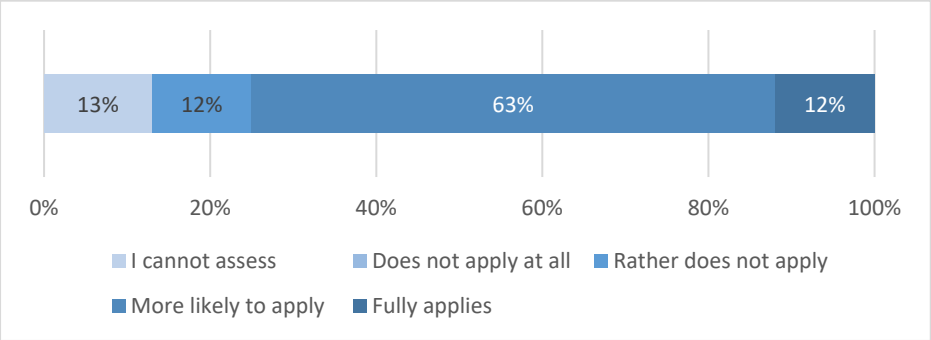


Figure 16: I can define the research design of observational studies, especially retrospective case-control studies [n=16]

I understand and I am able to interpret linear regression models and logistic regression models and explain differences and similarities of both.

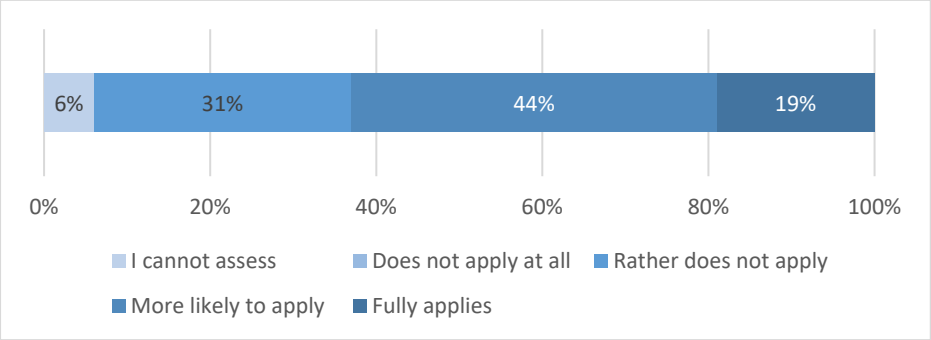


Figure 17: I understand and I am able to interpret linear regression models and logistic regression models and explain differences and similarities of both [n=16]

I am able outline logistic regression models for clinical observational data.

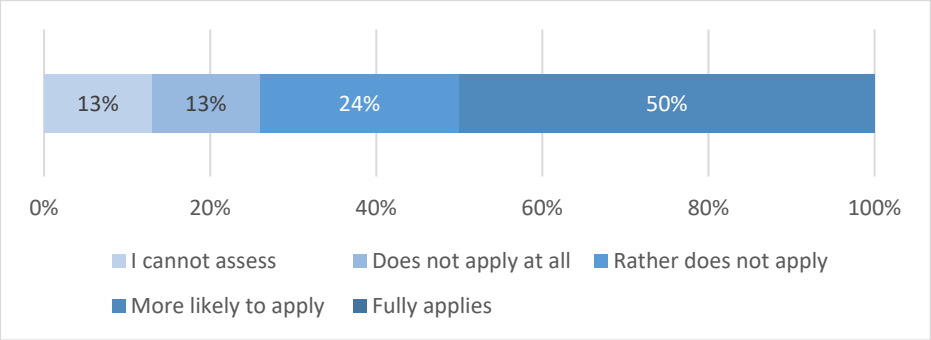


Figure 18: I am able outline logistic regression models for clinical observational data [n=16]

I know how to execute statistical calculations with the help of the statistics program SPSS.

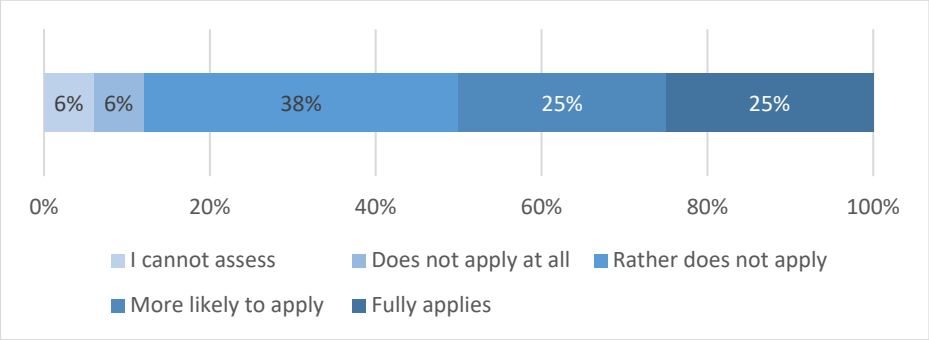


Figure 19: I know how to execute statistical calculations with the help of the statistics program SPSS [n=16]

I am able to interpret and appraise the models with regard to their model coefficients and model quality.

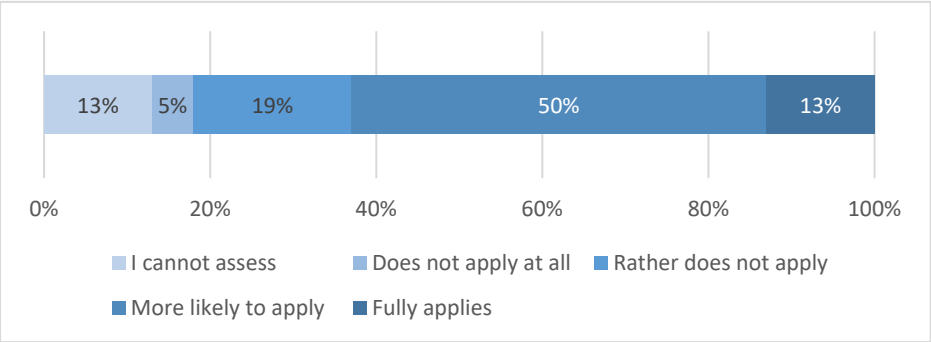


Figure 20: I am able to interpret and appraise the models with regard to their model coefficients and model quality [n=16]

I know how to apply SPSS for logistic regression models.

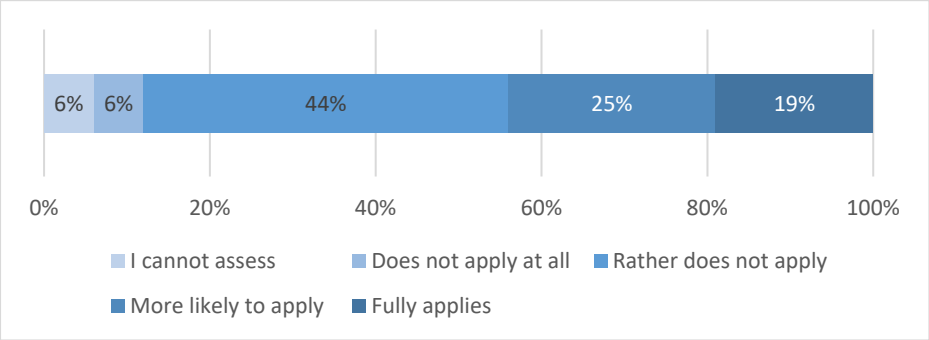


Figure 21: I know how to apply SPSS for logistic regression models [n=16]

I am able to interpret the results of statistics analyses and models.

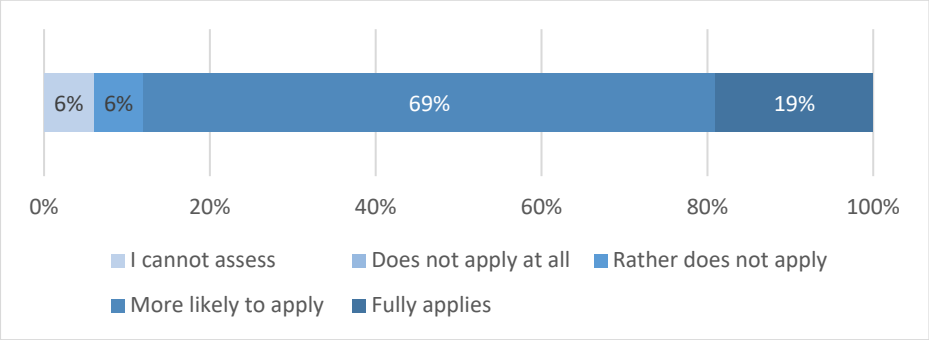


Figure 22: I am able to interpret the results of statistics analyses and models [n=16]

I know how to explain statistical analyses for the appropriate target group, e.g. physician, nurses.

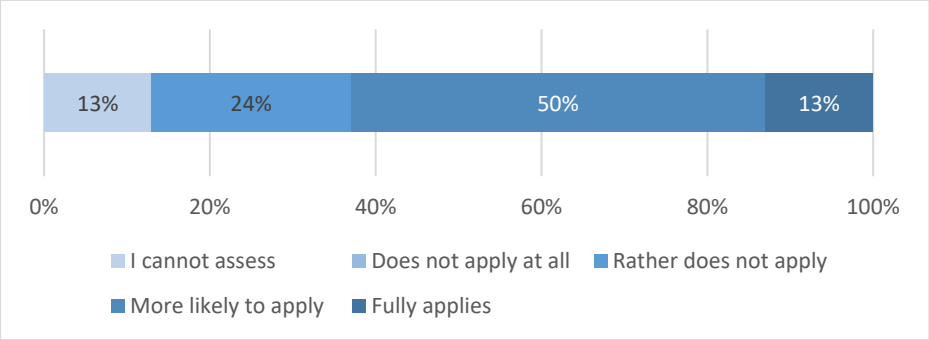


Figure 23: I know how to explain statistical analyses for the appropriate target group, e.g. physician, nurses [n=16]

I am able to reflect critically and interpret the model created against the background of the clinical use case.

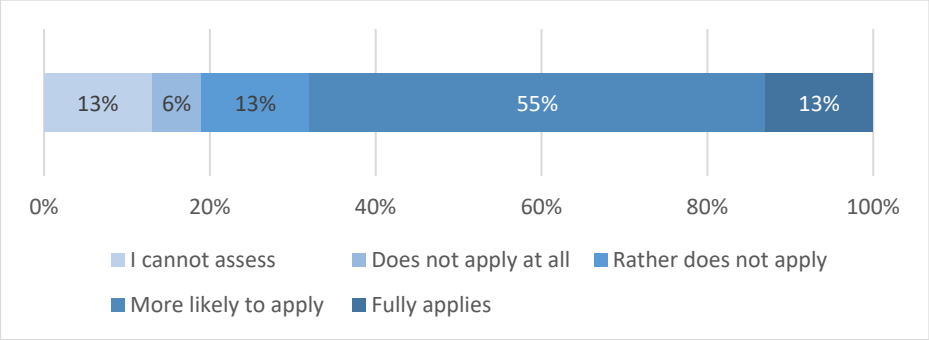


Figure 24: I am able to reflect critically and interpret the model created against the background of the clinical use case [n=16]

I am able to appraise the context in which clinical data are generated and the research purposes for which they are used.

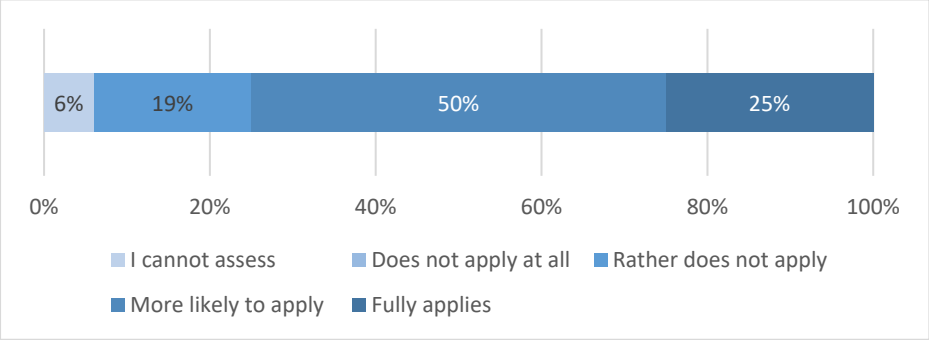


Figure 25: I am able to appraise the context in which clinical data are generated and the research purposes for which they are used [n=16]

I know how to identify appropriate study designs and quantitative analysis methods.

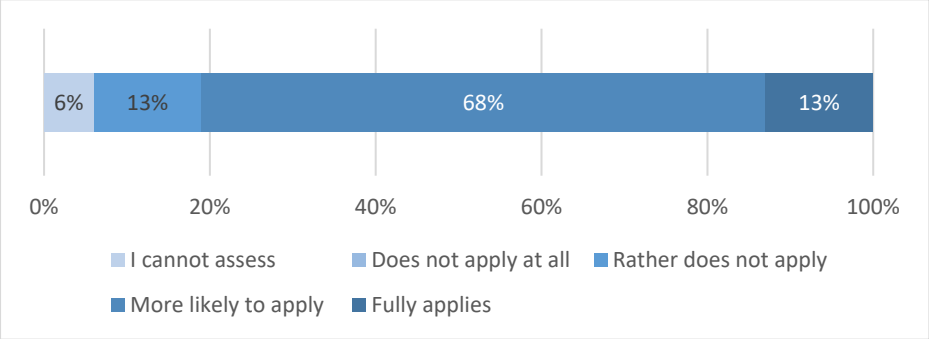


Figure 26: I know how to identify appropriate study designs and quantitative analysis methods [n=16]

In know how to execute meaningful descriptive statistical analyses and model building for clinical data.

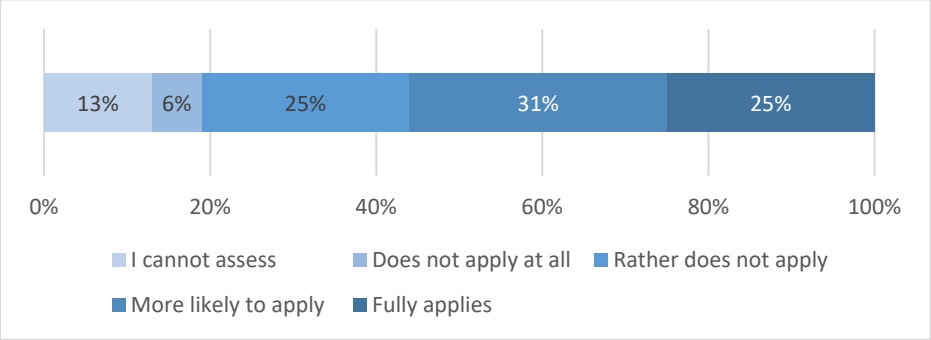


Figure 27: In know how to execute meaningful descriptive statistical analyses and model building for clinical data [n=16]

I am able to evaluate the usefulness and validity of the created model for practical work.

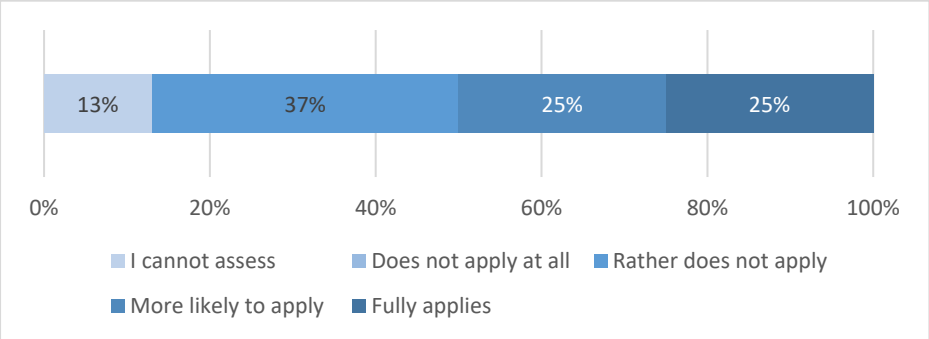


Figure 28: I am able to evaluate the usefulness and validity of the created model for practical work [n=16]

2.4 Personal information

Age

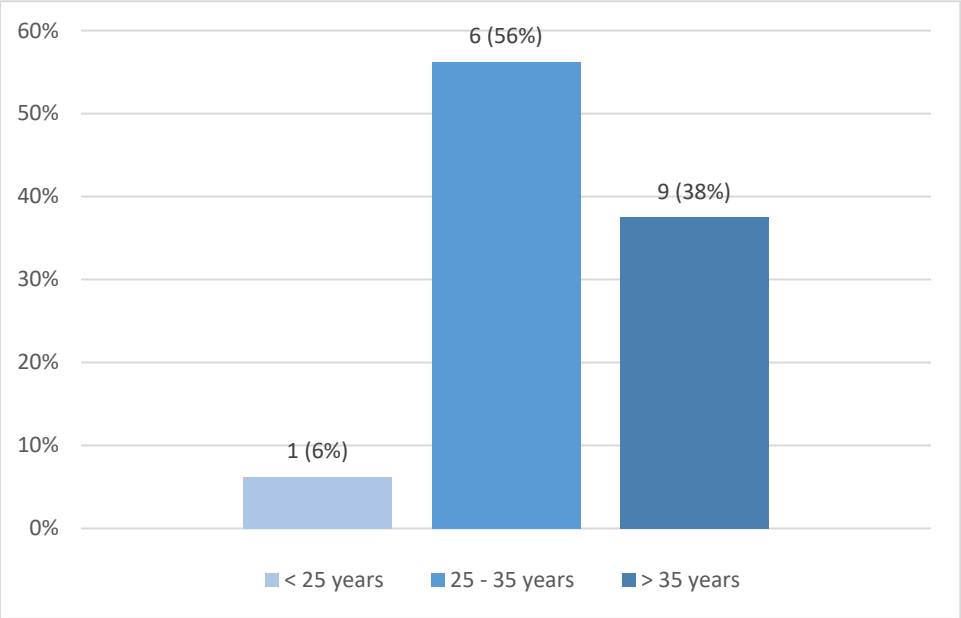


Figure 29: Age [n=16]

Gender

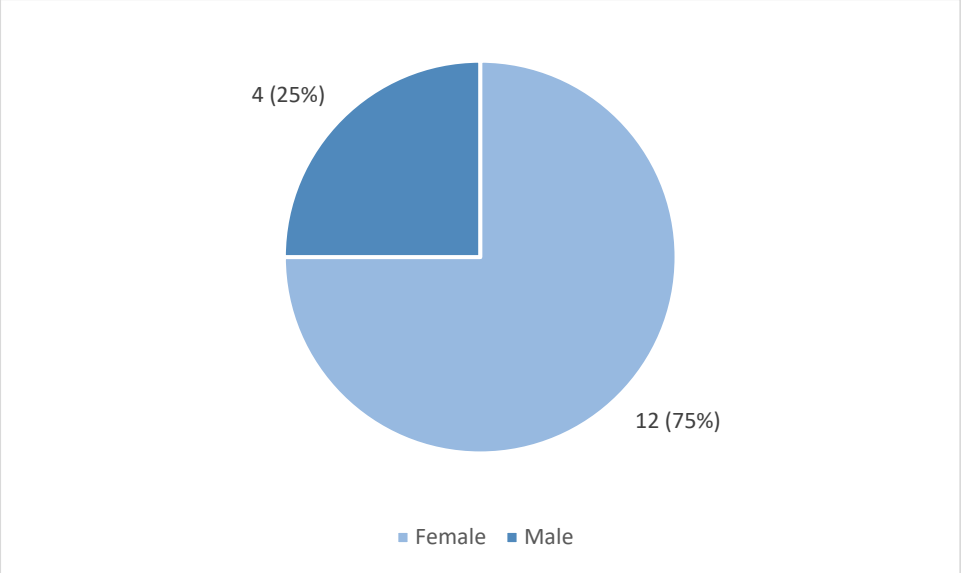


Figure 30: Gender [n=16]

University

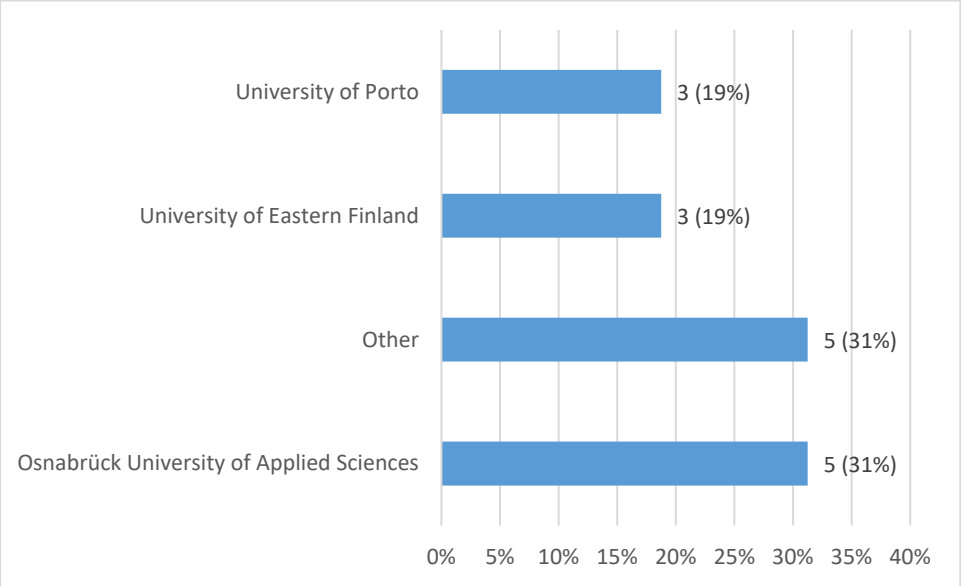


Figure 31: University [n=16]

Answers in category "Other":

- University of South Carolina (n=2)
- Essen (n=1)
- Charite Universitätsmedizin Berlin (n=1)
- I am employee (n=1)

Study degree

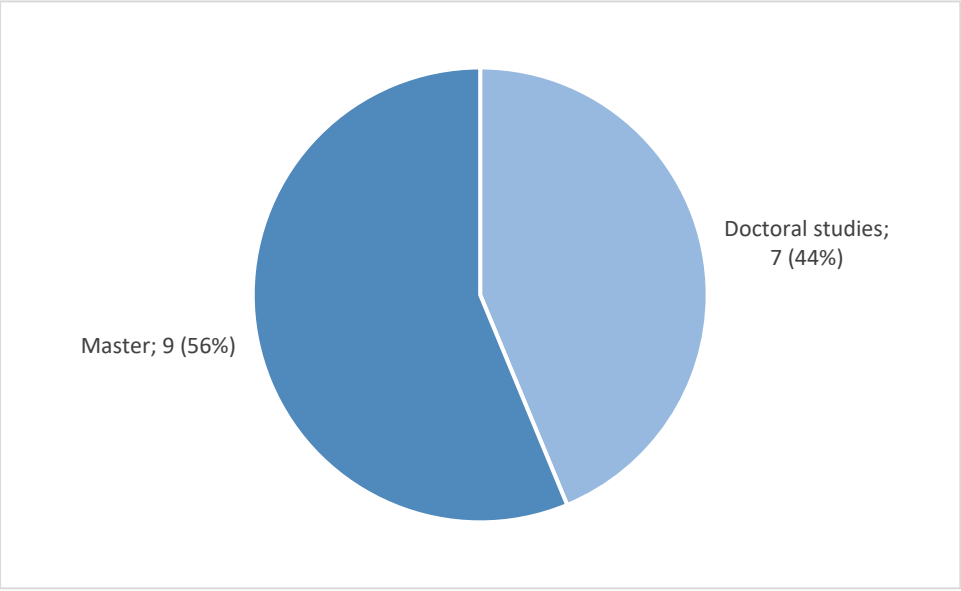


Figure 32: Study degree [n=16]

Field of study

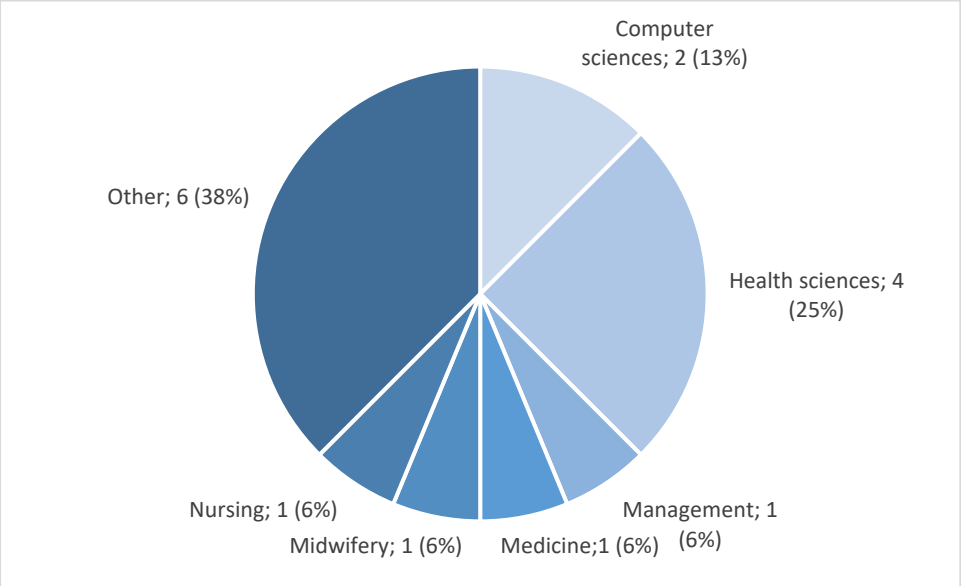
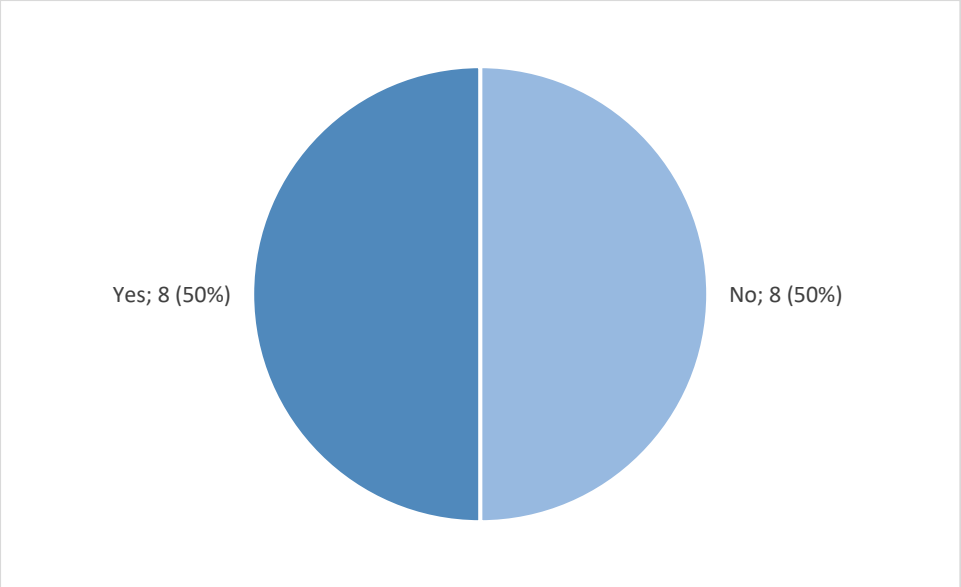


Figure 33: Field of study [n=16]

Answers in category "Other":

- Bioengineering (n=1)
- Health and Human Services Informatics (n=1)
- Health Informatics (n=1)
- Health Information Technology (n=2)

Have you had participated previously in distance learning courses (besides any forced by the restriction of pandemics)?



3 Post-Evaluation Results

3.1 Course participation

The instructors responded well to the different needs of the participants.

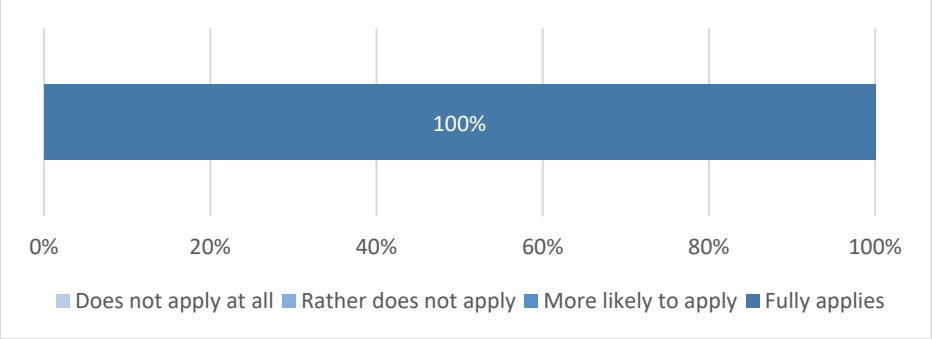


Figure 34: The instructors responded well to the different needs of the participants [n=10]

The instructors ensured that participants remained active and engaged in a productive dialogue.

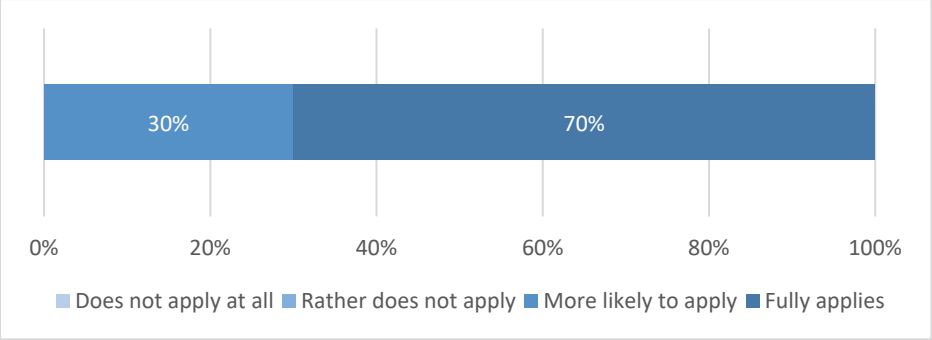


Figure 35: The instructors ensured that participants remained active and engaged in a productive dialogue [n=10]

The level of difficulty of the course was appropriate.

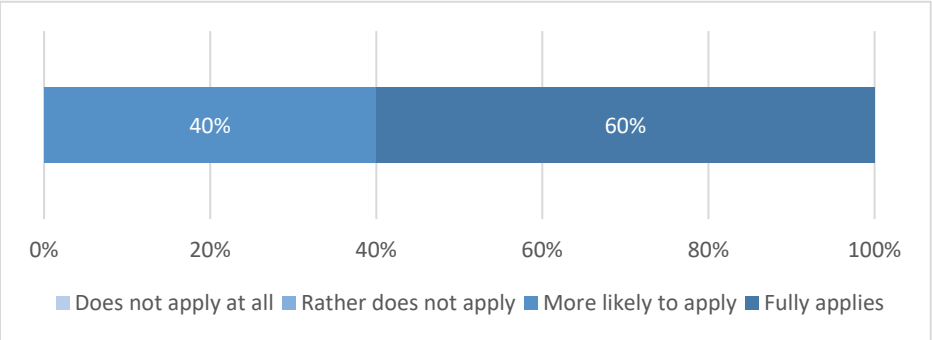


Figure 36: The level of difficulty of the course was appropriate [n=10]

The amount of content was appropriate.

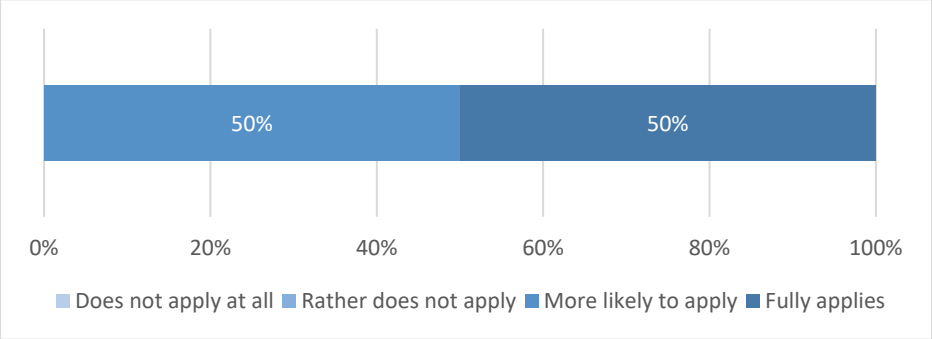


Figure 37: The amount of content was appropriate [n=10]

The learning objectives of the course were clear.

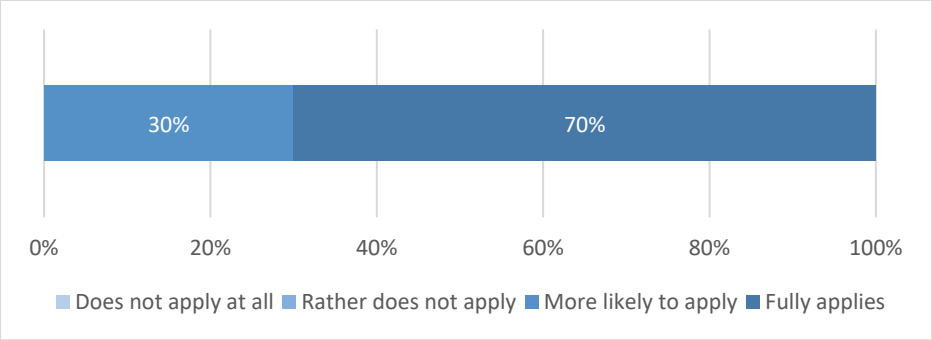


Figure 38: The learning objectives of the course were clear [n=10]

Learning objectives set for the course were realistic.

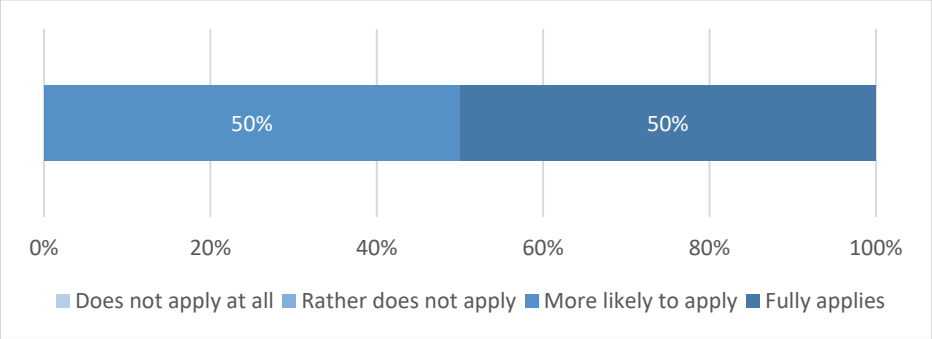


Figure 39: Learning objectives set for the course were realistic [n=10]

I set my own learning objectives for this course.

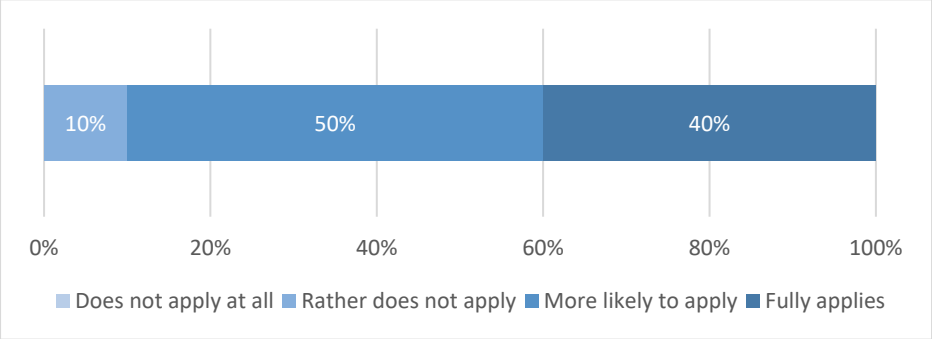


Figure 40: I set my own learning objectives for this course [n=10]

I reflected my own learning objectives to the course learning objectives.

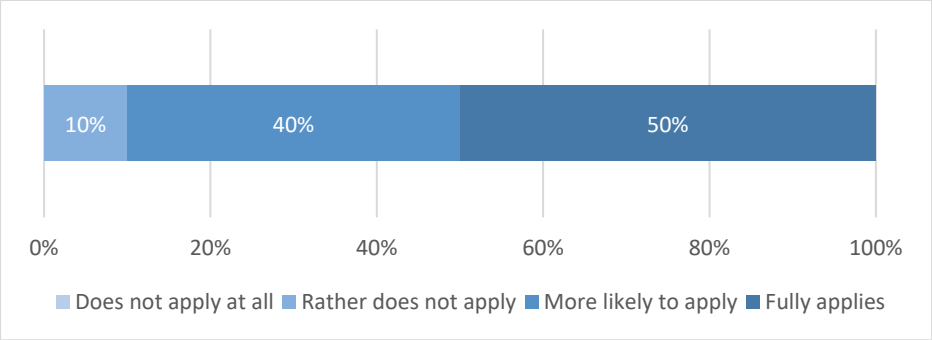


Figure 41: I reflected my own learning objectives to the course learning objectives [n=10]

I had the opportunity to reflect on what I have learned.

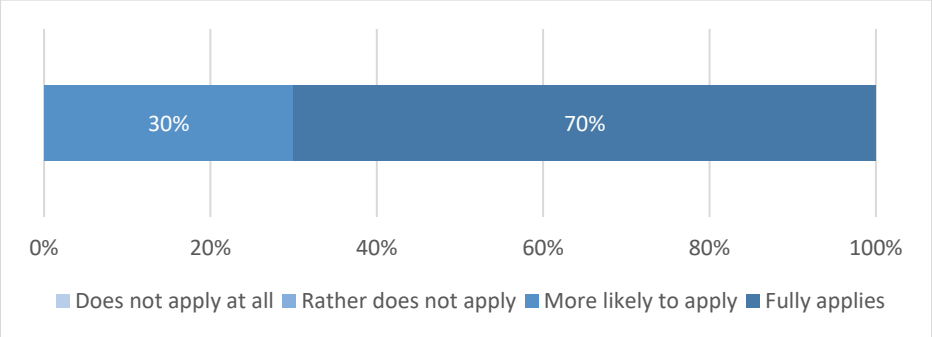


Figure 42: I had the opportunity to reflect on what I have learned [n=10]

3.2 Evaluation of the personal benefit and practical relevance

Contents and learning material

Attending the course was worthwhile for me personally.

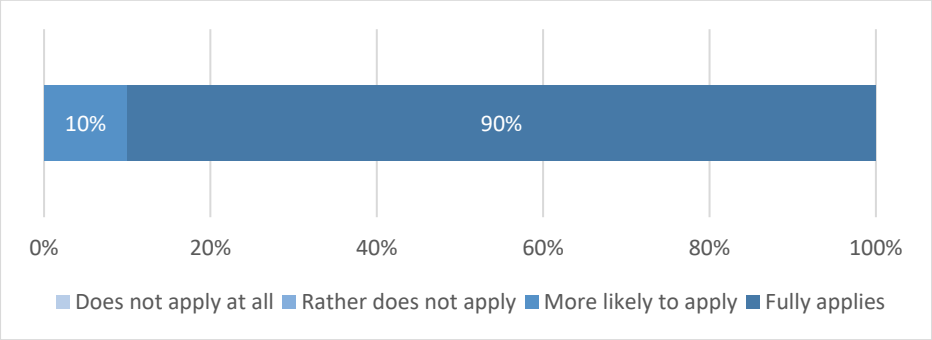


Figure 43: Attending the course was worthwhile for me personally [n=10]

I was aware of central course contents.

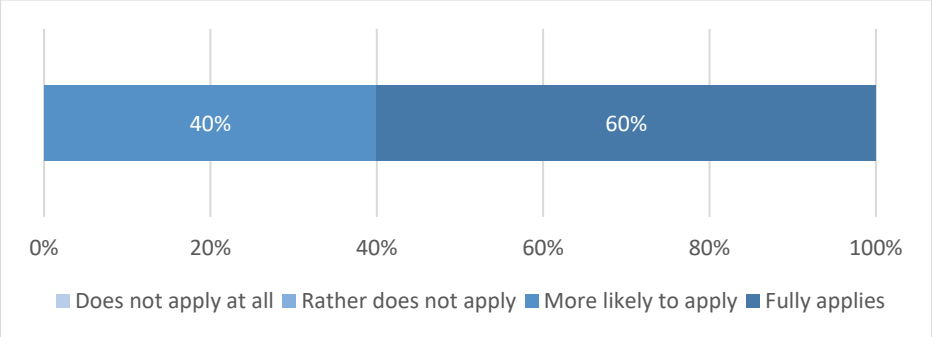


Figure 44: I was aware of central course contents [n=10]

My understanding of the course topic has evolved through participation.

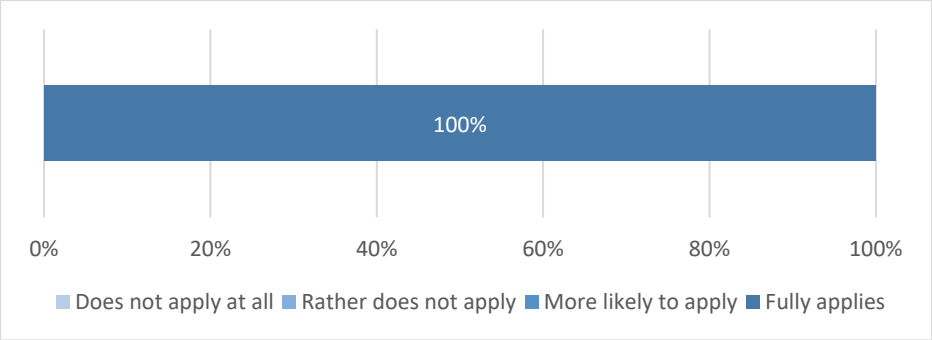


Figure 45: My understanding of the course topic has evolved through participation [n=10]

The relation between theory and practice was shown.

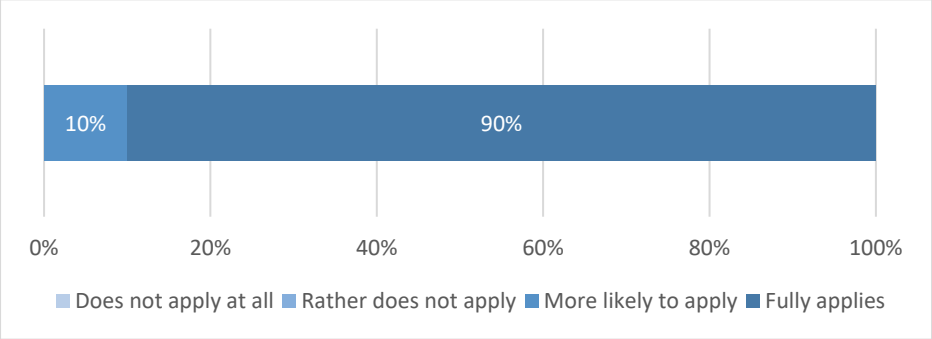


Figure 46: The relation between theory and practice was shown [n=10]

The course content and learning materials supported me in deep learning.

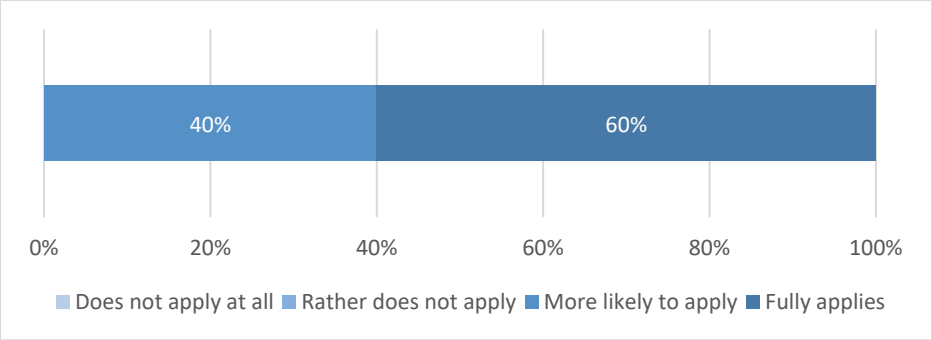


Figure 47: The course content and learning materials supported me in deep learning [n=10]

The contents of the course were appropriate compared to my previous knowledge.

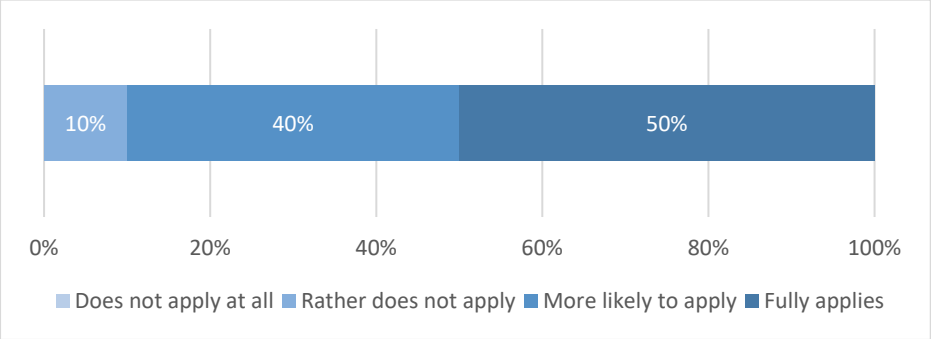


Figure 48: The contents of the course were appropriate compared to my previous knowledge [n=10]

The level of the course was appropriate to my previous knowledge.

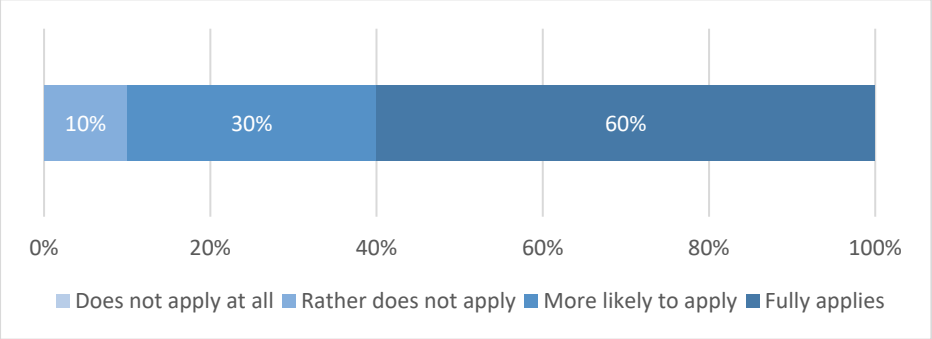


Figure 49: The level of the course was appropriate to my previous knowledge [n=10]

I was able to take advantage of what I have learned earlier about this topic.

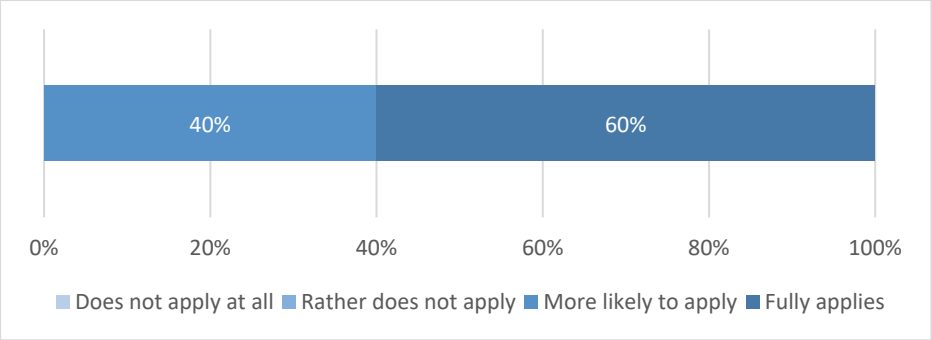


Figure 50: I was able to take advantage of what I have learned earlier about this topic [n=10]

I think I will still be able to report what I learned some time after the course was offered.

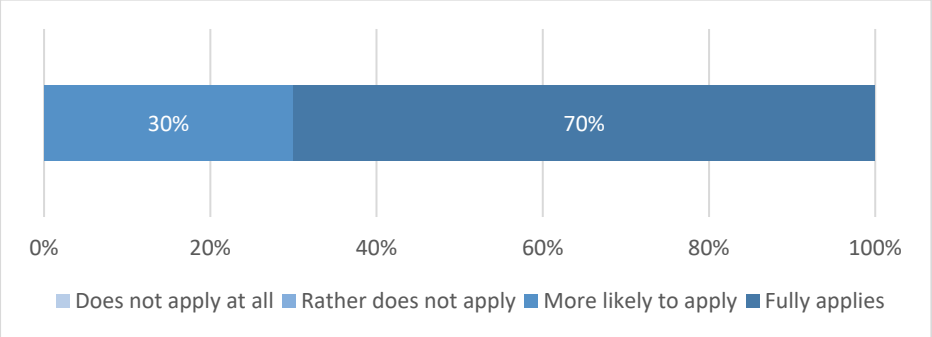


Figure 51: I think I will still be able to report what I learned some time after the course was offered [n=10]

Learning process and teaching methods

The teaching methods suited well to the learning objectives set for the course.

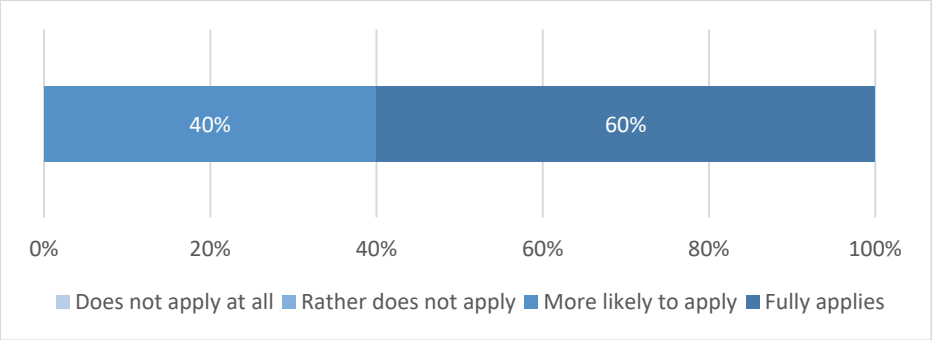


Figure 52: The teaching methods suited well to the learning objectives set for the course [n=10]

Course planning proved teacher´s expertise of the teaching methods and learning.

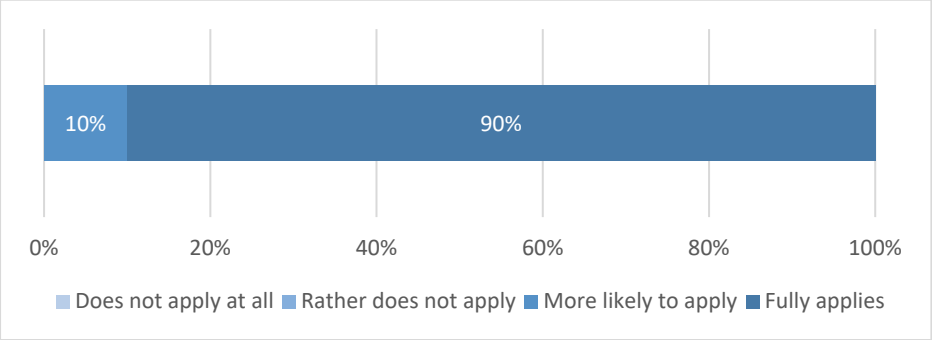


Figure 53: Course planning proved teacher´s expertise of the teaching methods and learning [n=10]

I took responsibility for my own learning, I was active and motivated.

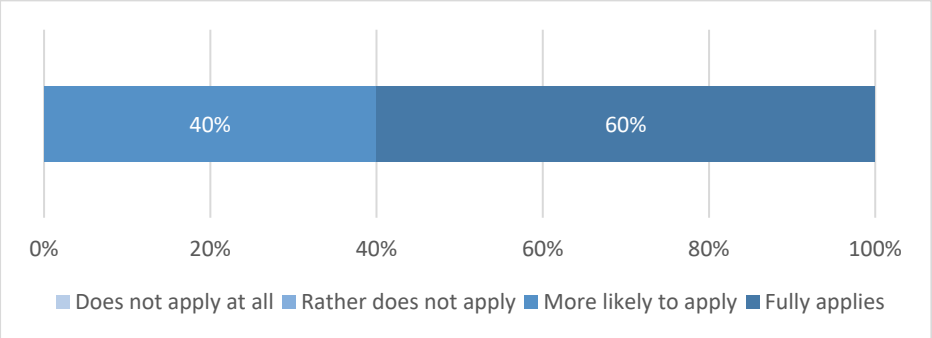


Figure 54: I took responsibility for my own learning, I was active and motivated [n=10]

I pointed out my motivation to understand and develop my own learning in the course.

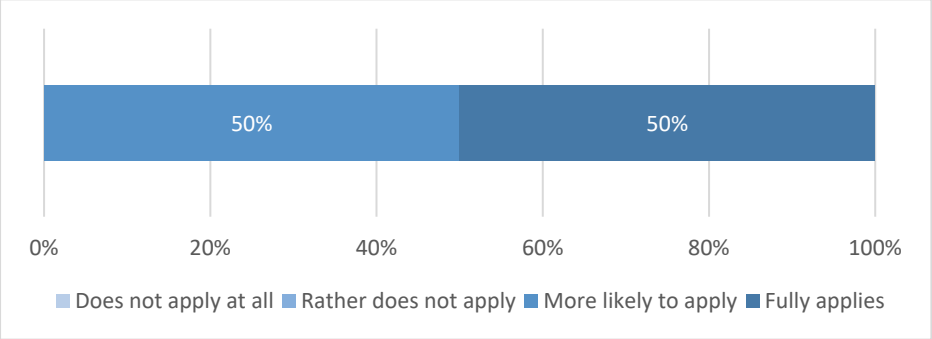


Figure 55: I pointed out my motivation to understand and develop my own learning in the course [n=10]

Self-learning phase

The scope of the self-learning phase was appropriate.

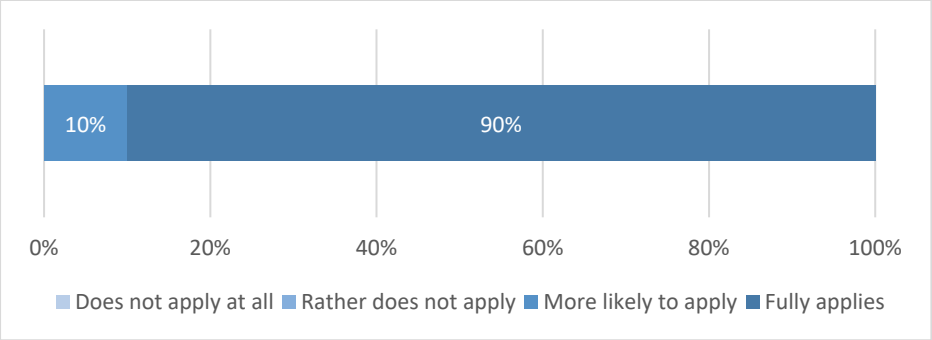


Figure 56: The scope of the self-learning phase was appropriate [n=10]

The tasks were understandable.

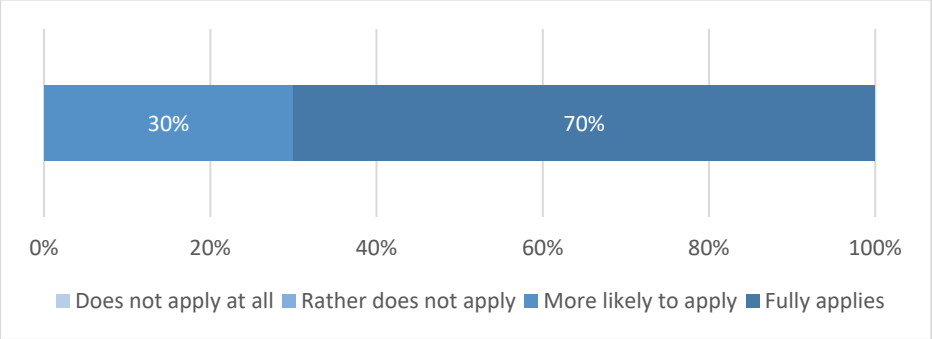


Figure 57: The tasks were understandable [n=10]

The time frame for completing the assignments was reasonable.

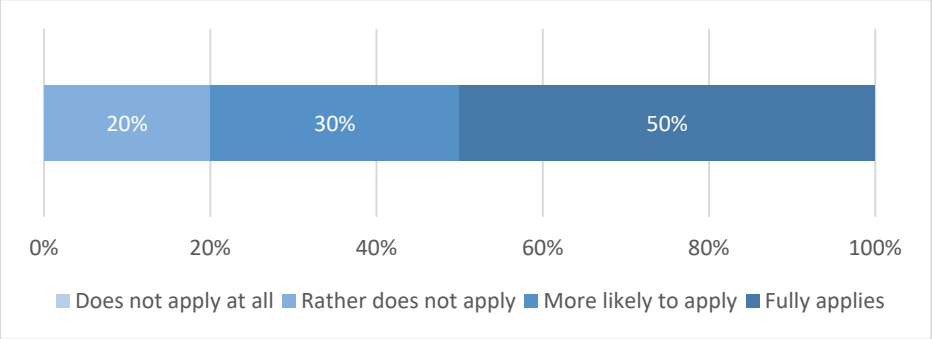


Figure 58: The time frame for completing the assignments was reasonable [n=10]

Case-based/problem-based learning

The self-directed learning based on the case studies suited me.

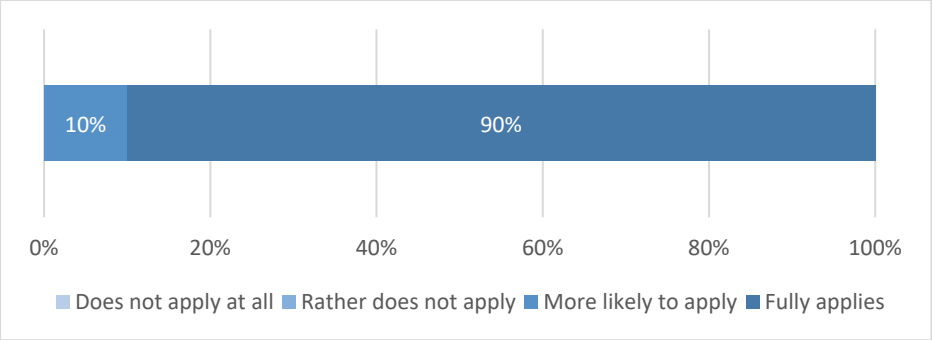


Figure 59: The self-directed learning based on the case studies suited me [n=10]

The online discussion ware useful for me to understand different perspectives.

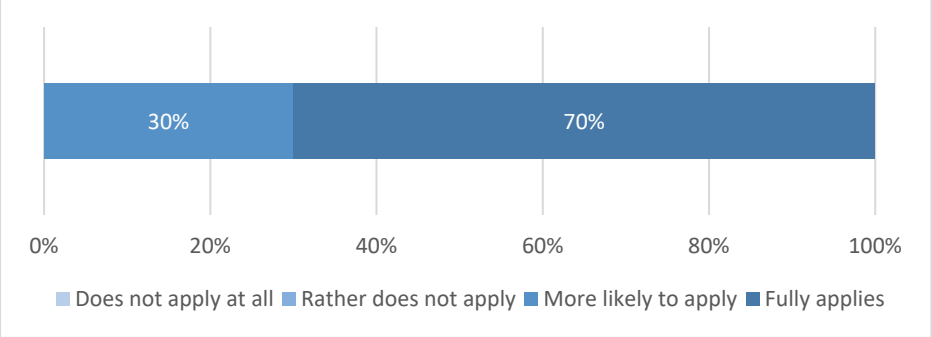


Figure 60: The online discussion ware useful for me to understand different perspectives [n=10]

The course dealt with real problem situations and everyday situations related to the subject to be studied.

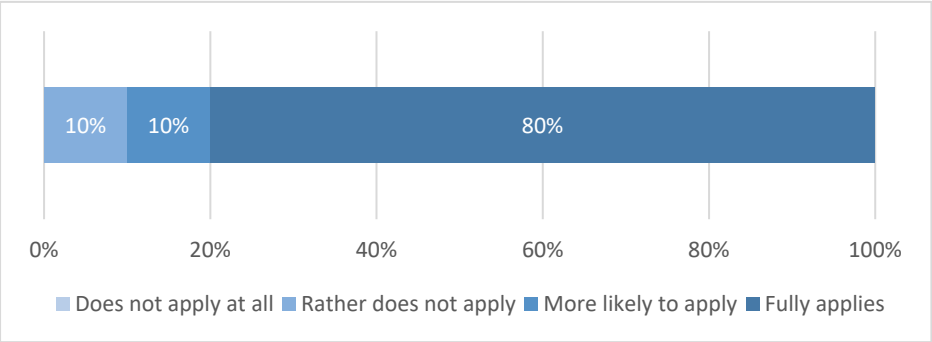


Figure 61: The course dealt with real problem situations and everyday situations related to the subject to be studied [n=10]

I researched and used various sources to answer the learning objectives.

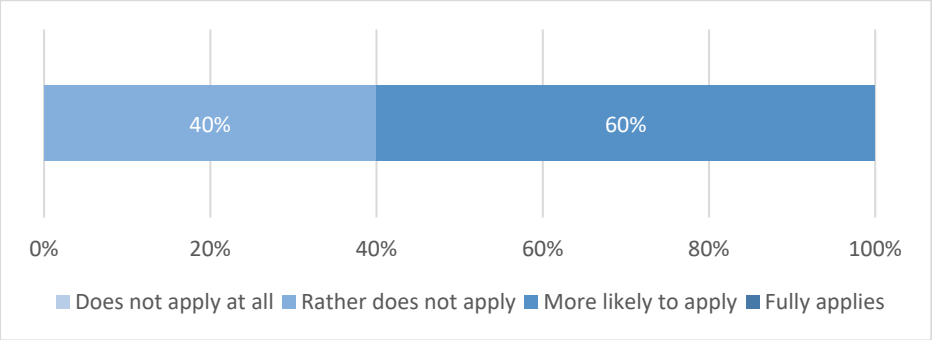


Figure 62: I researched and used various sources to answer the learning objectives [n=10]

Moodle/e-Learning

The Moodle learning platform is user-friendly.

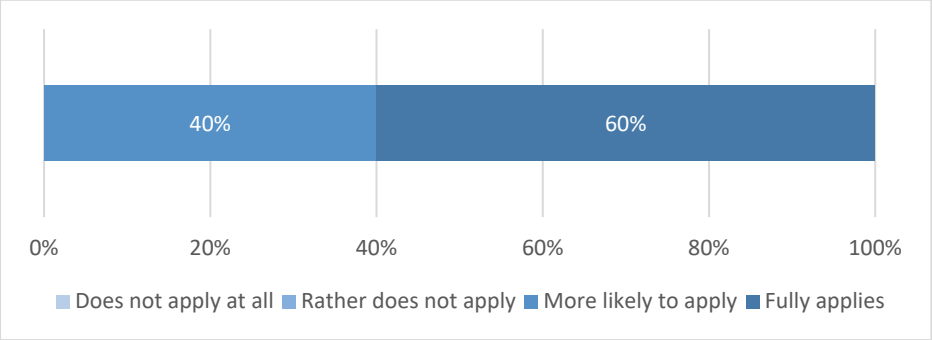


Figure 63: The Moodle learning platform is user-friendly [n=10]

The information I was looking for is easy to find in Moodle.

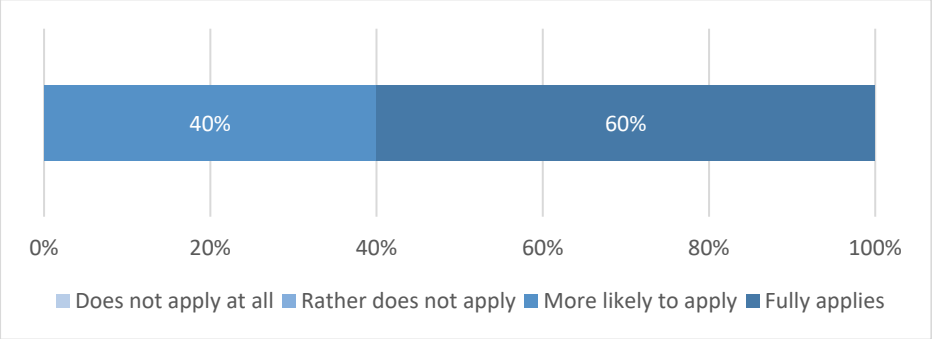


Figure 64: The information I was looking for is easy to find in Moodle [n=10]

The content in Moodle is presented in a comprehensible way.

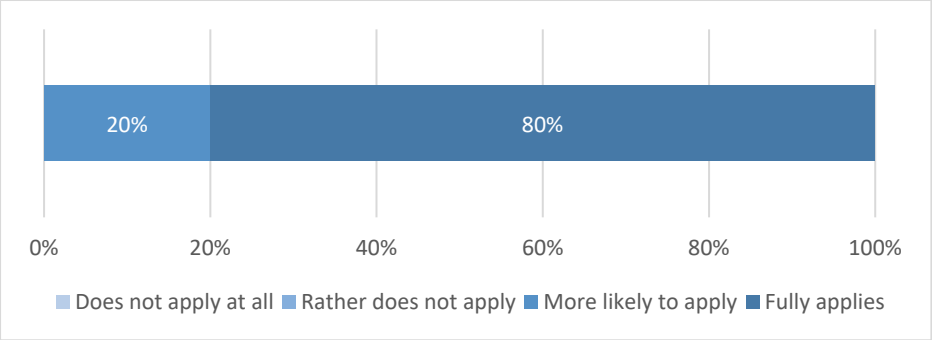


Figure 65: The content in Moodle is presented in a comprehensible way [n=10]

Finding my way through Moodle was easy.

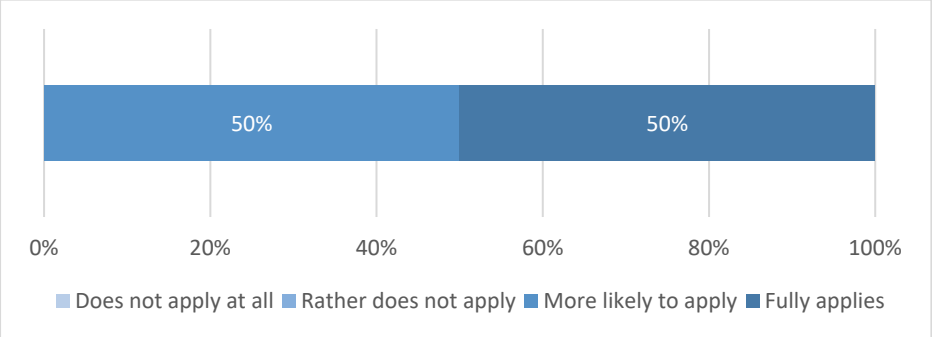


Figure 66: Finding my way through Moodle was easy [n=10]

It took more time to work with Moodle than I expected.

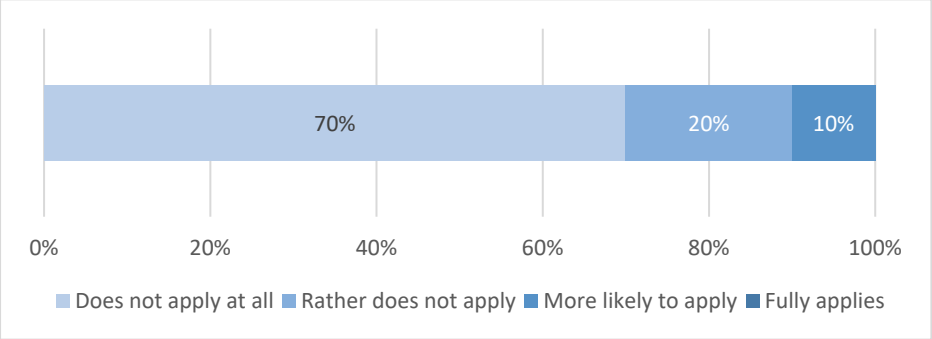


Figure 67: It took more time to work with Moodle than I expected [n=10]

I felt comfortable communicating online.

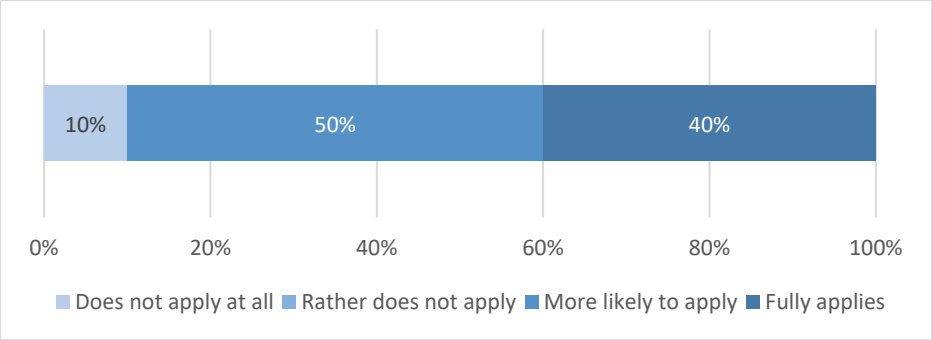


Figure 68: I felt comfortable communicating online [n=10]

I received helpful support with technical questions.

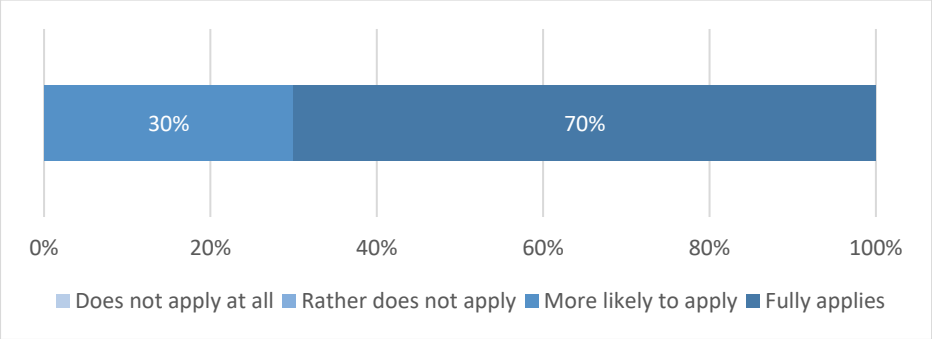


Figure 69: I received helpful support with technical questions [n=10]

The learning platform supported the exchange with the other participants.

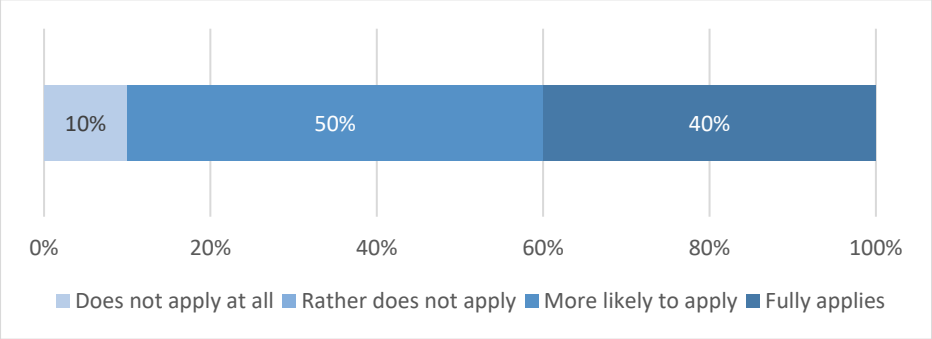


Figure 70: The learning platform supported the exchange with the other participants [n=10]

The teacher guided studying and learning expertly in e-learning/Moodle environment.

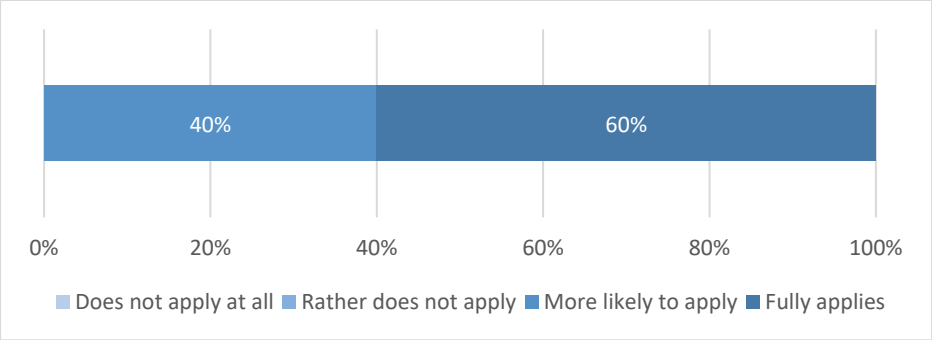


Figure 71: The teacher guided studying and learning expertly in e-learning/Moodle environment [n=10]

I used the e-learning environment/Moodle in that way the teacher guided.

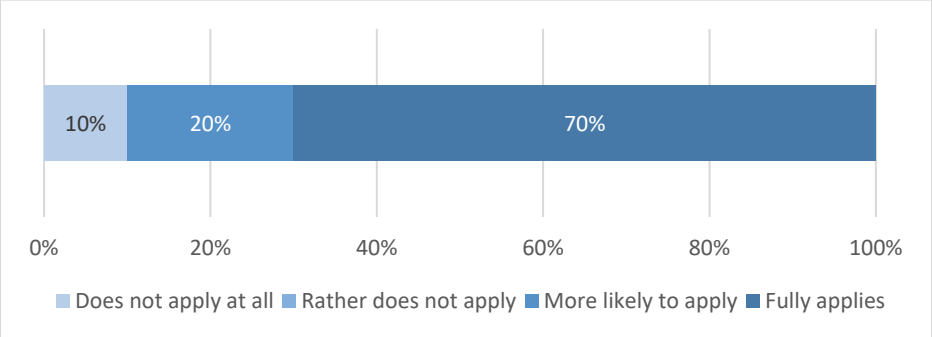


Figure 72: I used the e-learning environment/Moodle in that way the teacher guided [n=10]

Studying in the online course has improved my skills to use information and communication technology.

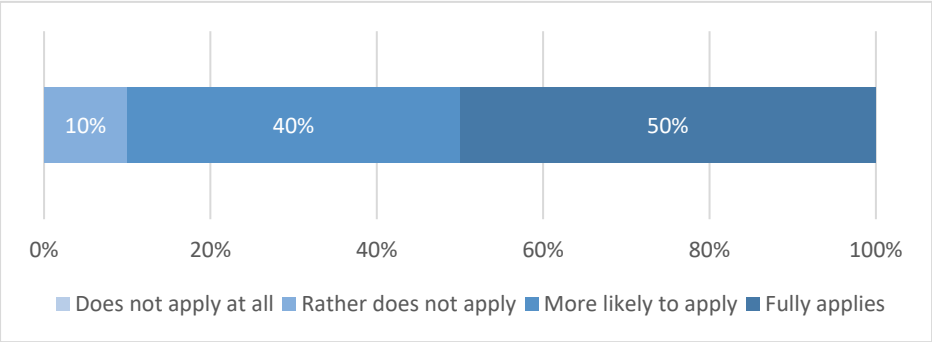


Figure 73: Studying in the online course has improved my skills to use information and communication technology [n=10]

The online environment/Moodle helped me to improve my teamwork skills.

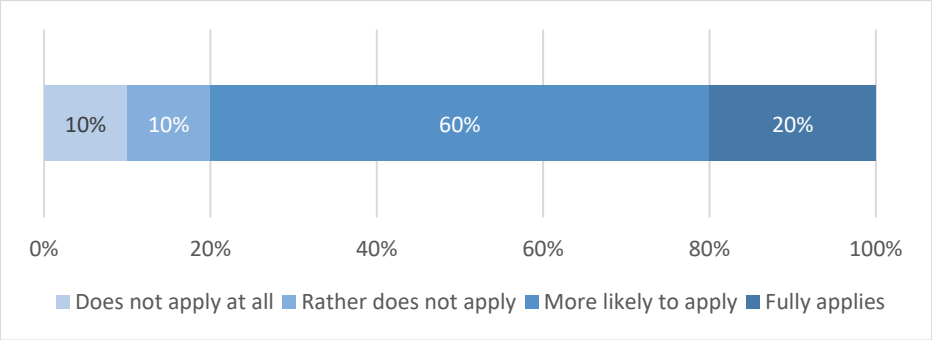


Figure 74: The online environment/Moodle helped me to improve my teamwork skills [n=10]

3.3 Course expectations

Through the course, I have …

… gained new theoretical knowledge

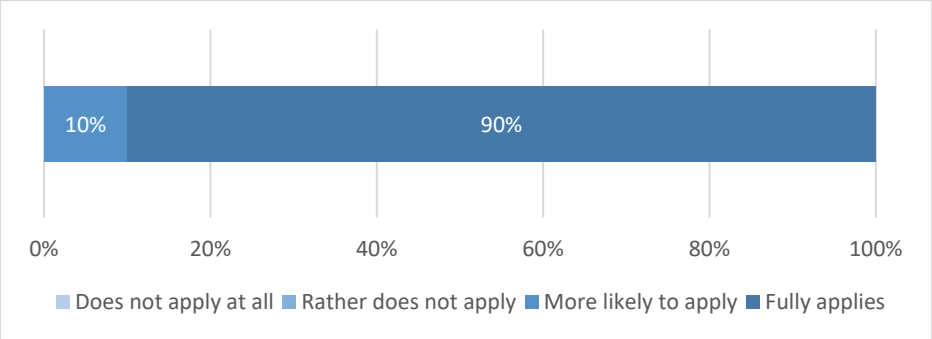


Figure 75: … gained new theoretical knowledge [n=10]

… made new (and helpful) contacts.

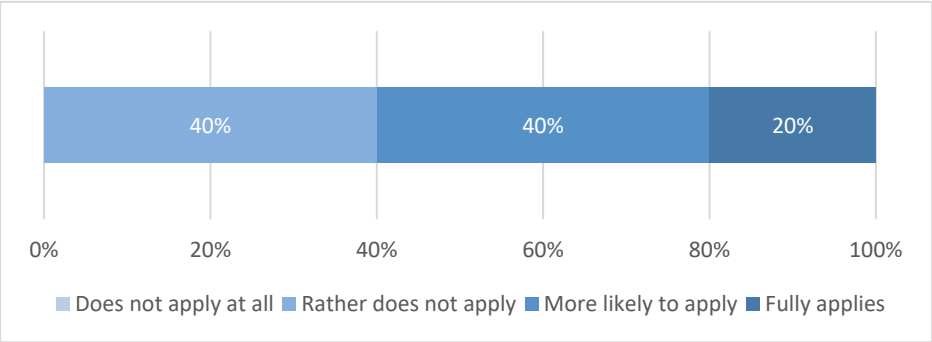


Figure 76: … made new (and helpful) contacts [n=10]

… gained new knowledge for my studies.

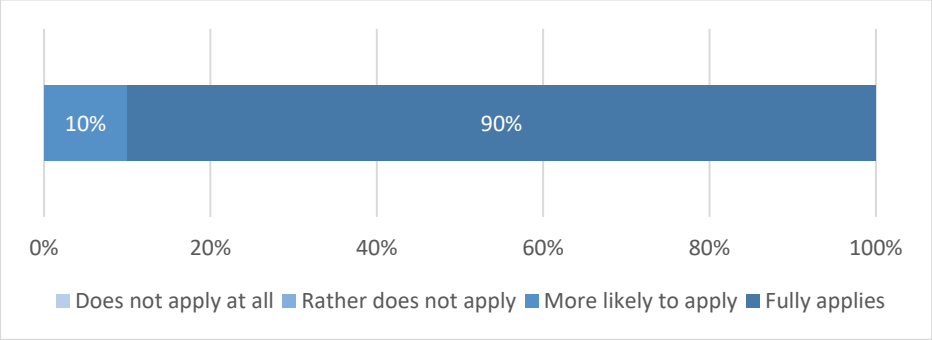


Figure 77: … gained new knowledge for my studies [n=10]

… received individual support.

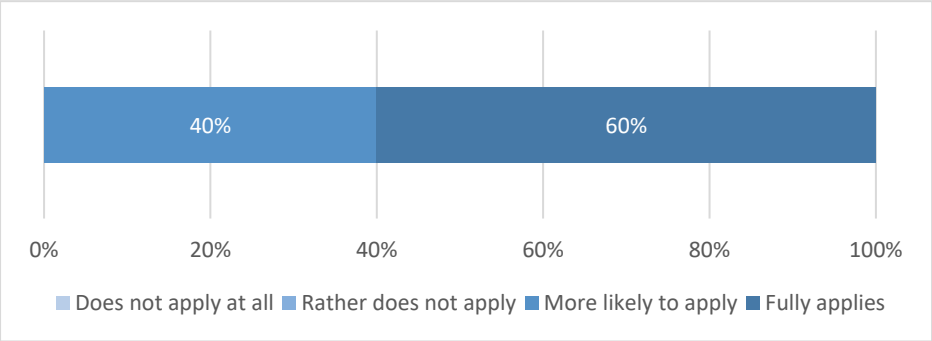


Figure 78: … received individual support [n=10]

… got helpful impulses for my studies.

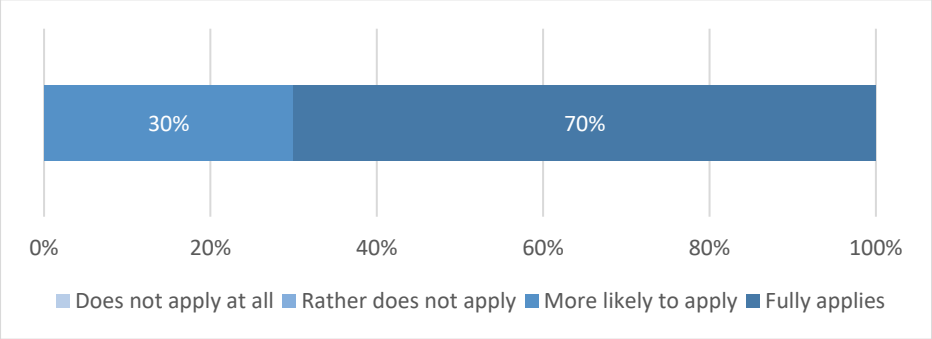


Figure 79: … got helpful impulses for my studies [n=10]

… appropriately applied instruments and methods for the analysis of clinical data.

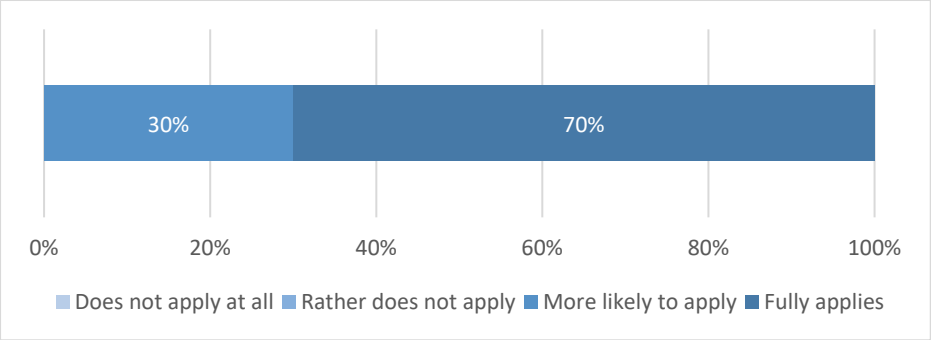


Figure 80: … appropriately applied instruments and methods for the analysis of clinical data [n=10]

3.4 Experience with the course

I know the characteristics of routine data and different methods of data collection.

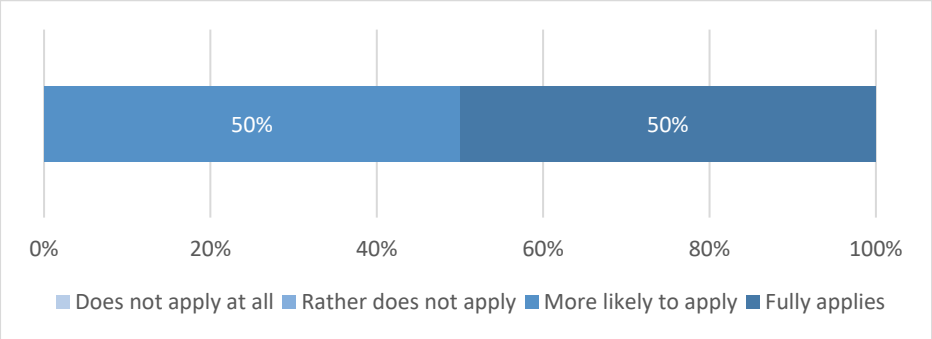


Figure 81: I know the characteristics of routine data and different methods of data collection [n=10]

I am able to list the characteristics and differences between experimental and observational data and categorize clinical data raised in care into this context.

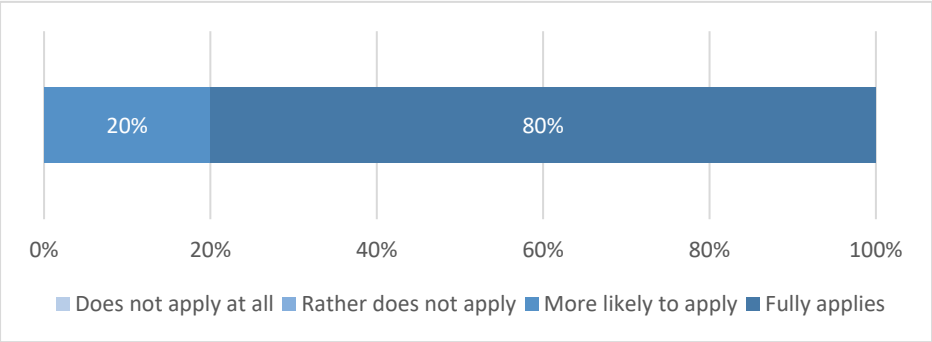


Figure 82: I am able to list the characteristics and differences between experimental and observational data and categorize clinical data raised in care into this context [n=10]

I can define the research design of observational studies, especially retrospective case-control studies.

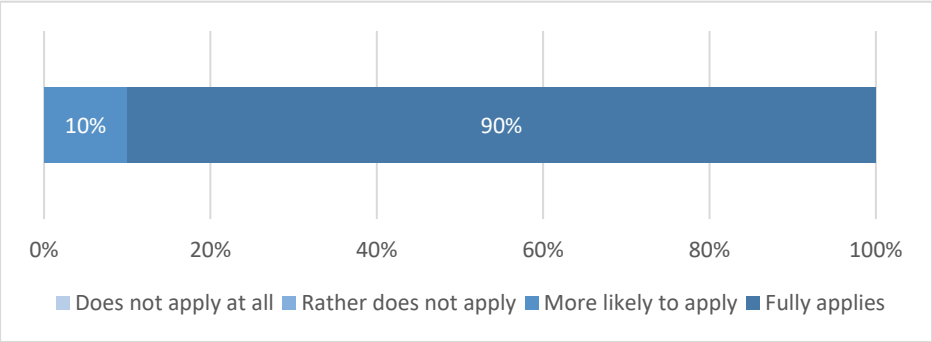


Figure 83: I can define the research design of observational studies, especially retrospective case-control studies [n=10]

I understand and I am able to interpret linear regression models and logistic regression models and explain differences and similarities of both.

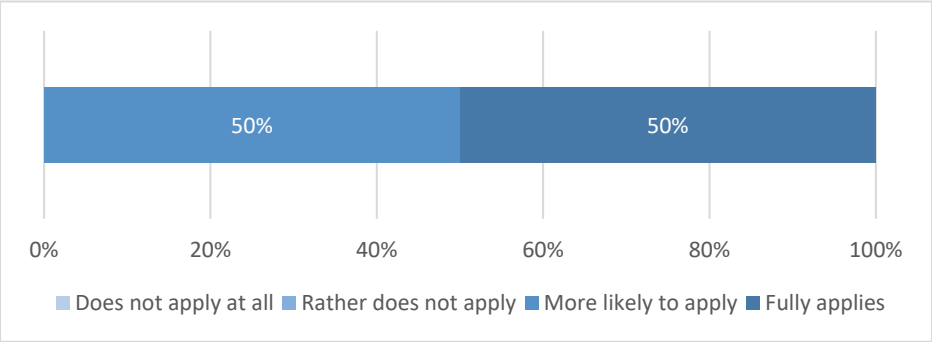


Figure 84: I understand and I am able to interpret linear regression models and logistic regression models and explain differences and similarities of both [n=10]

I am able outline logistic regression models for clinical observational data.

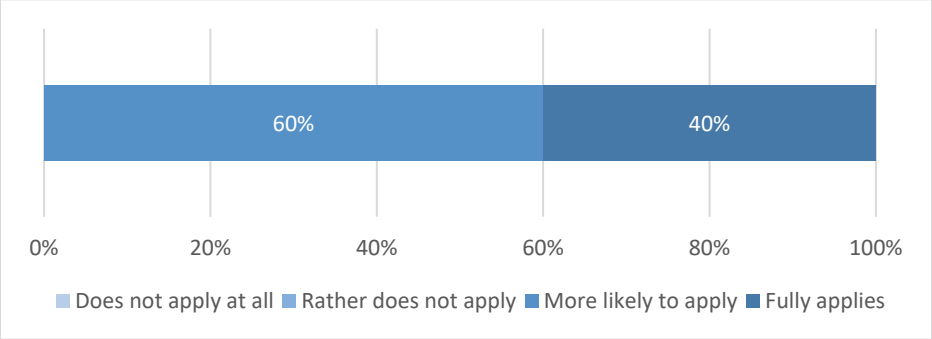


Figure 85: I am able outline logistic regression models for clinical observational data [n=10]

I know how to execute statistical calculations with the help of the statistics program SPSS.

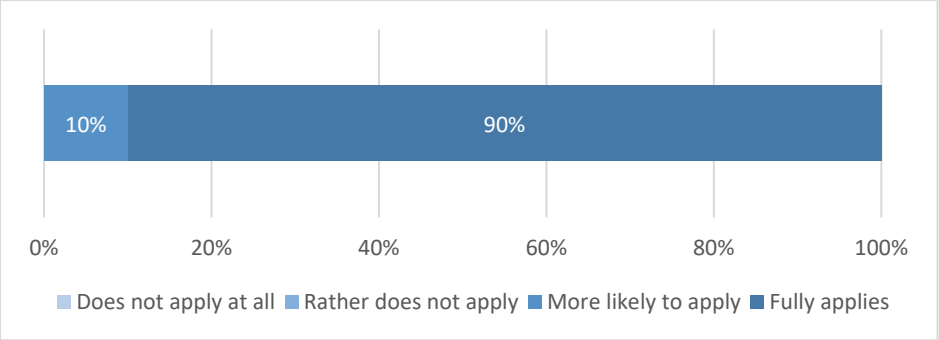


Figure 86: I know how to execute statistical calculations with the help of the statistics program SPSS [n=10]

I am able to interpret and appraise the models with regard to their model coefficients and model quality.

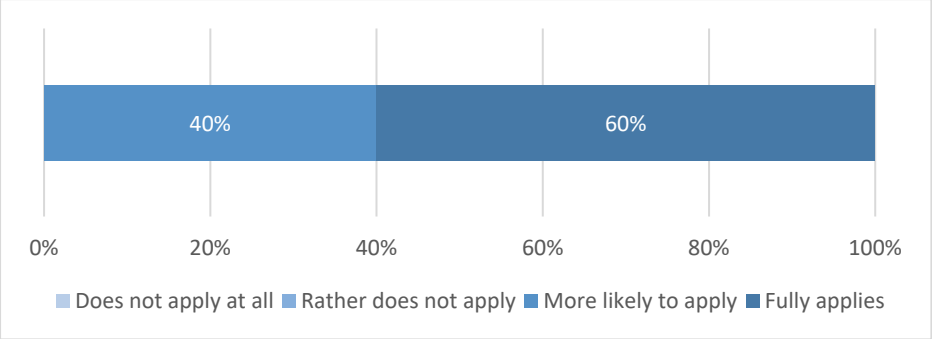


Figure 87: I am able to interpret and appraise the models with regard to their model coefficients and model quality [n=10]

I know how to apply SPSS for logistic regression models.

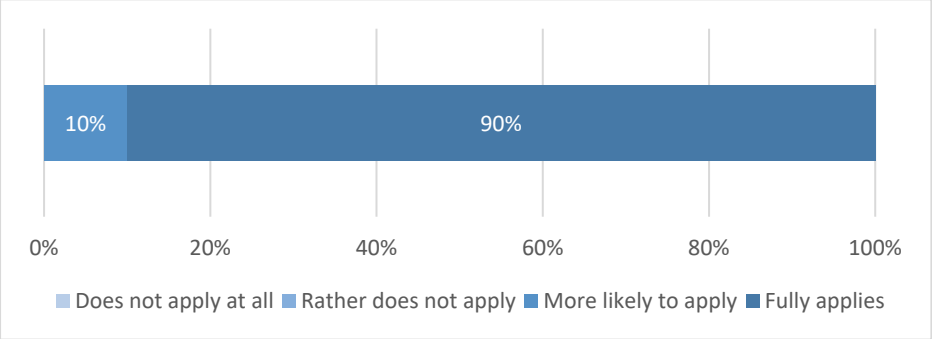


Figure 88: I know how to apply SPSS for logistic regression models [n=10]

I am able to interpret the results of statistics analyses and models.

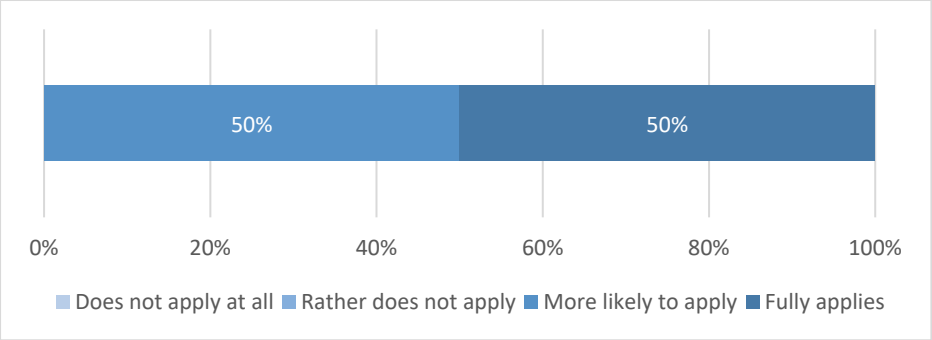


Figure 89: I am able to interpret the results of statistics analyses and models [n=10]

I know how to explain statistical analyses for the appropriate target group, e.g. physician, nurses.

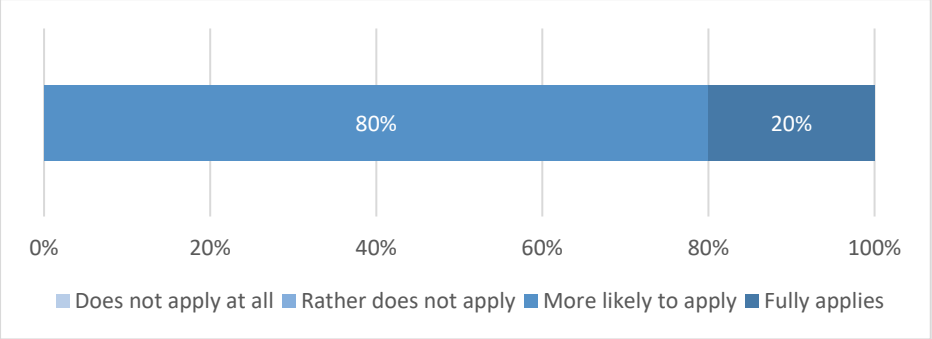


Figure 90: I know how to explain statistical analyses for the appropriate target group, e.g. physician, nurses [n=10]

I am able to reflect critically and interpret the model created against the background of the clinical use case.

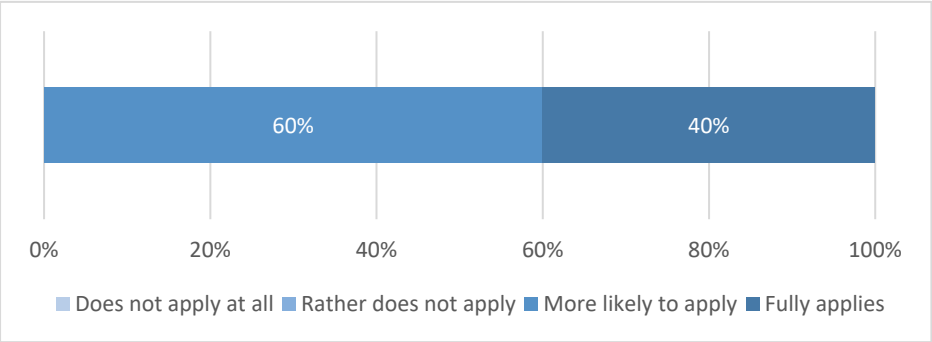


Figure 91: I am able to reflect critically and interpret the model created against the background of the clinical use case [n=10]

I am able to appraise the context in which clinical data are generated and the research purposes for which they are used.

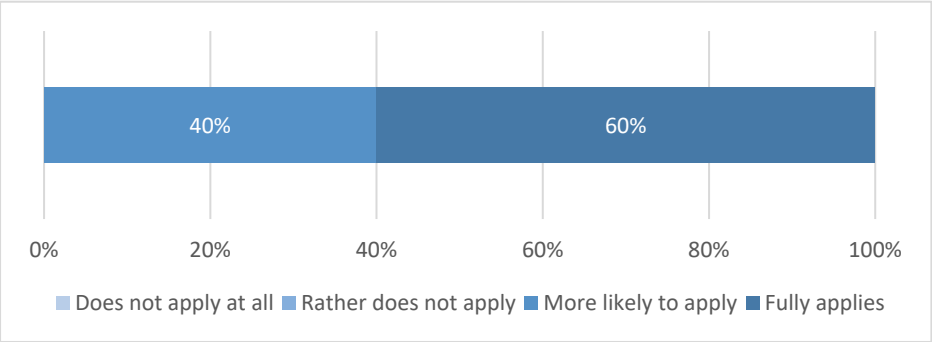


Figure 92: I am able to appraise the context in which clinical data are generated and the research purposes for which they are used [n=10]

I know how to identify appropriate study designs and quantitative analysis methods.

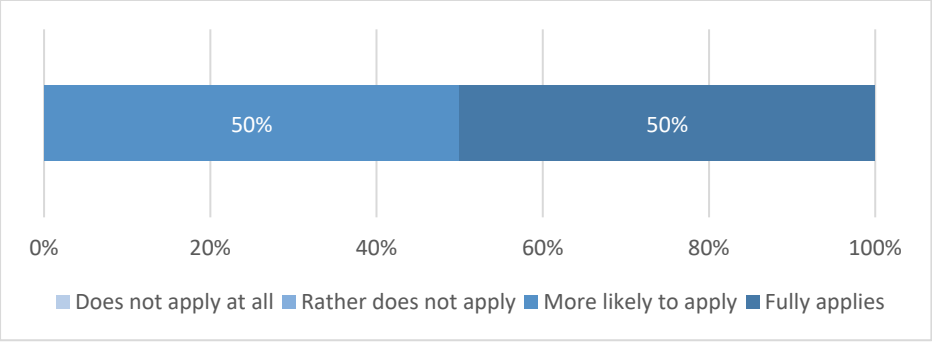


Figure 93: I know how to identify appropriate study designs and quantitative analysis methods [n=10]

In know how to execute meaningful descriptive statistical analyses and model building for clinical data.

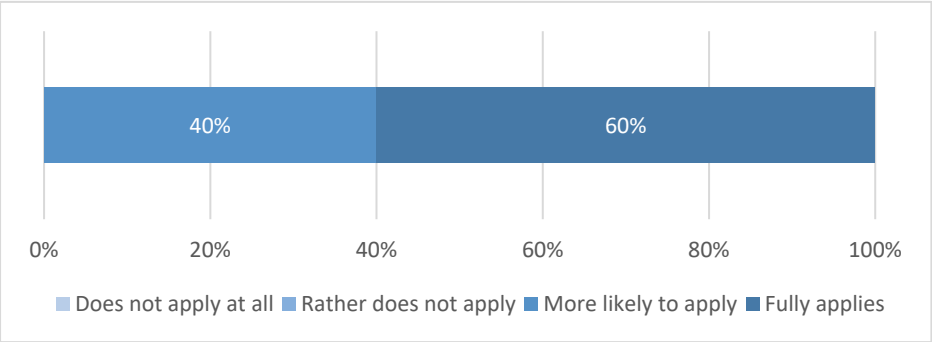


Figure 94: In know how to execute meaningful descriptive statistical analyses and model building for clinical data [n=10]

I am able to evaluate the usefulness and validity of the created model for practical work.

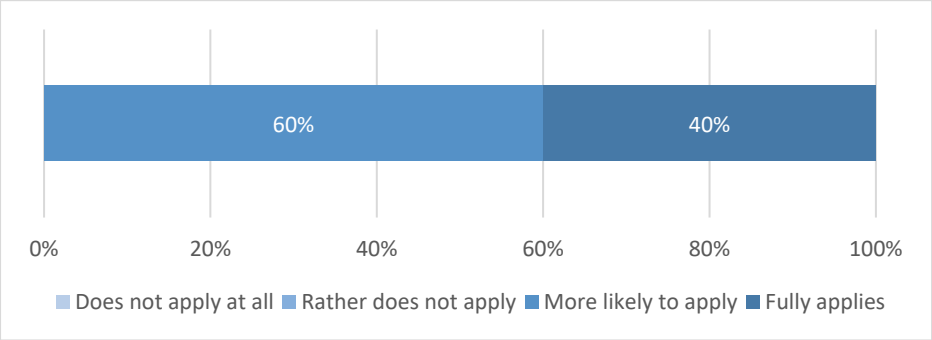


Figure 95: I am able to evaluate the usefulness and validity of the created model for practical work [n=10]

3.5 Overall assessment

I would recommend the course to other students/professionals.

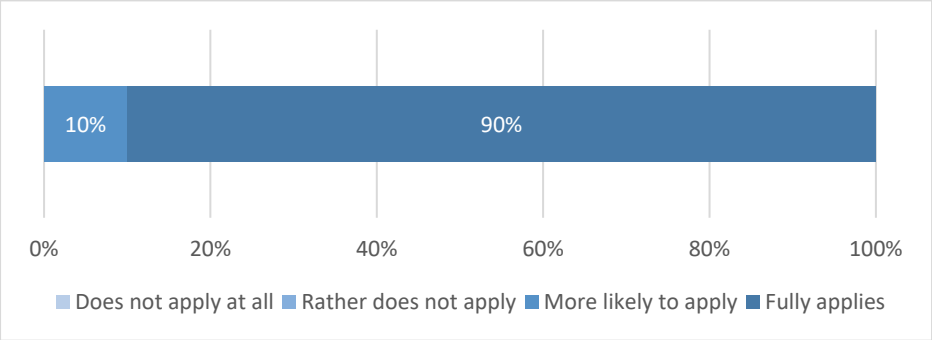


Figure 96: I would recommend the course to other students/professionals [n=10]

From my point of view, there was a good balance between effort and benefit of the course.

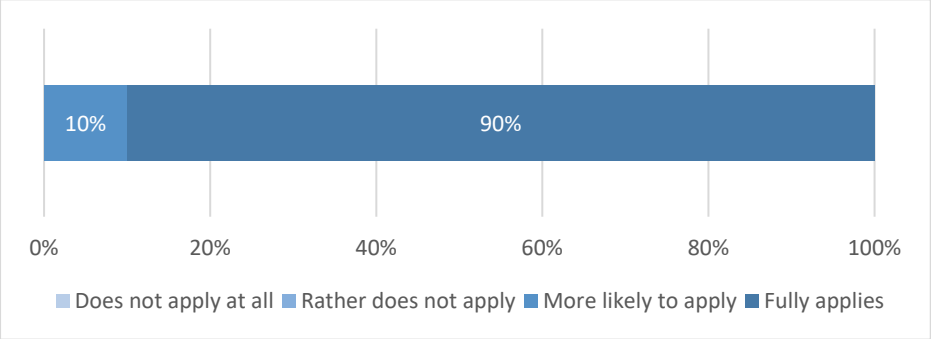


Figure 97: From my point of view, there was a good balance between effort and benefit of the course [n=10]

From my point of view, such course offerings are very well suited to increase competencies in the area of clinical data analytics.

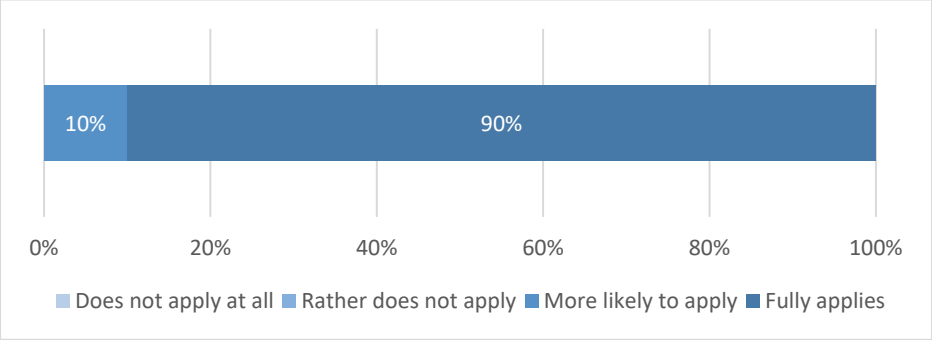
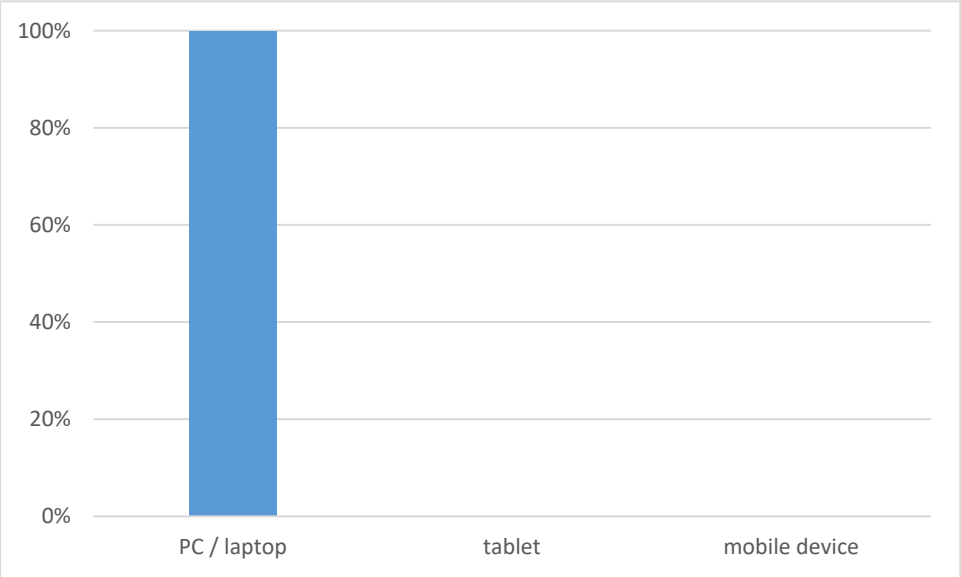


Figure 98: From my point of view, such course offerings are very well suited to increase competencies in the area of clinical data analytics [n=10]

How long did it take you to complete the self-learning material?

- 20 hours
- 20-25
- 1 week, when I do it everyday
- I really can´t estimate it
- 30
- This is hard to estimate – maybe 30-40 hours
- 60? I mean of 10 min. Quiz
- 15
- 9
- 16

Which technical device did you use to work on the e-learning content?



Comments

- The course was very well organized and the content was very good. Also the online sessions taught me much more than in previous courses I've taken in statistical analysis. I also liked that tasks had to do with real life situations and modelling them.
- Great programm!
- a big thank you to the organizers
- It might be helpful to clarify that the 3 days at the end require working on the projects after and before classes. This needs to be planned in for people, who have to work.
- A great job. Thanks
- The quizzes were fun and motivational. Jens did a really good job in preparing the videos!

4 Pre-post comparison

4.1 Course expectations

I expect from the course, …

… to gain new theoretical knowledge.

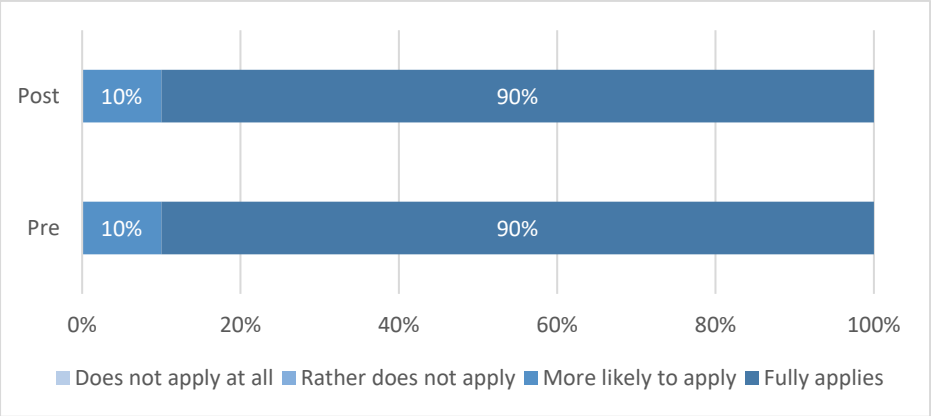


Figure 99: I expect form the course to gain new theoretical knowledge. [n=10]

… to make new (and helpful) contacts.

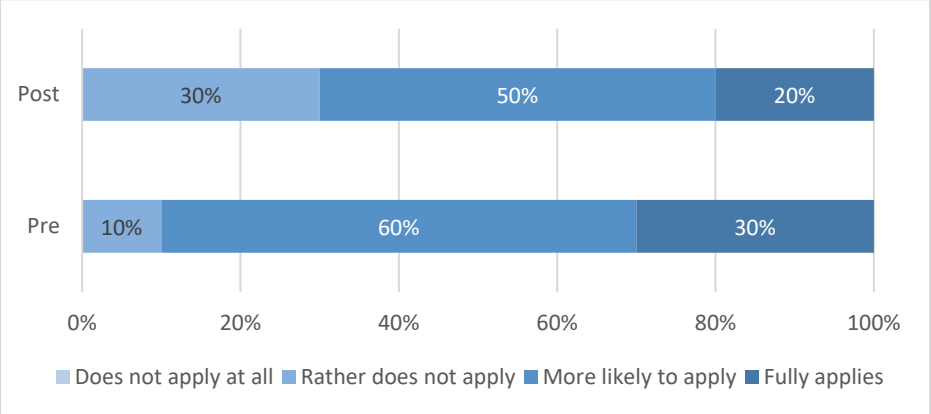


Figure 100: I expect from the course to make new (and helpful) contacts. [n=10]

… to get new knowledge for my studies.

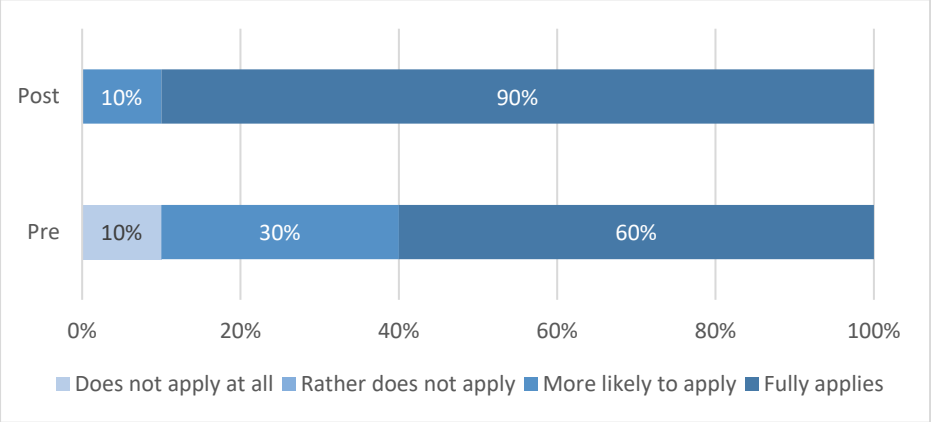


Figure 101: I expect from the course to get new knowledge for my studies [n=10]

… to receive individual support.

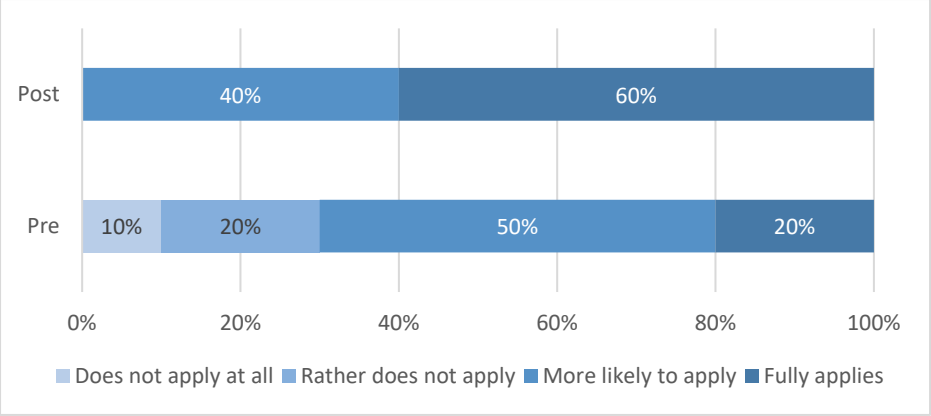


Figure 102: I expect from the course to receive individual support. [n=10]

… to get helpful impulses for my studies.

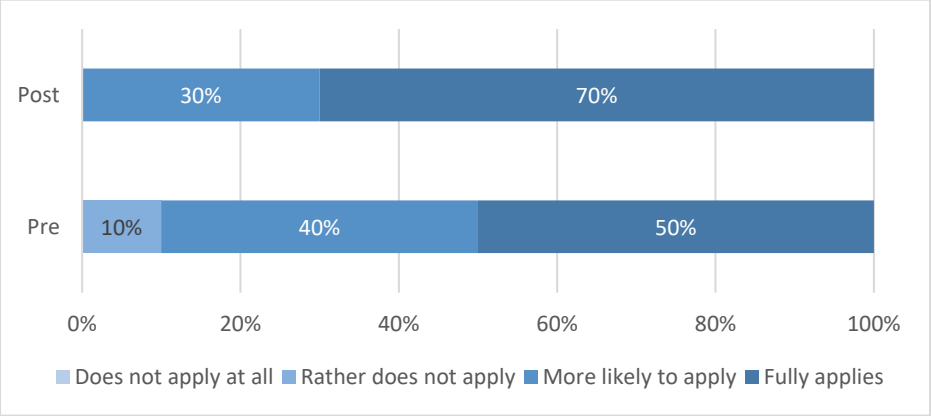


Figure 103: I expect from the course to get helpful impulses for my studies. [n=10]

… to be able to appropriately apply instruments and methods for the analysis of clinical data.

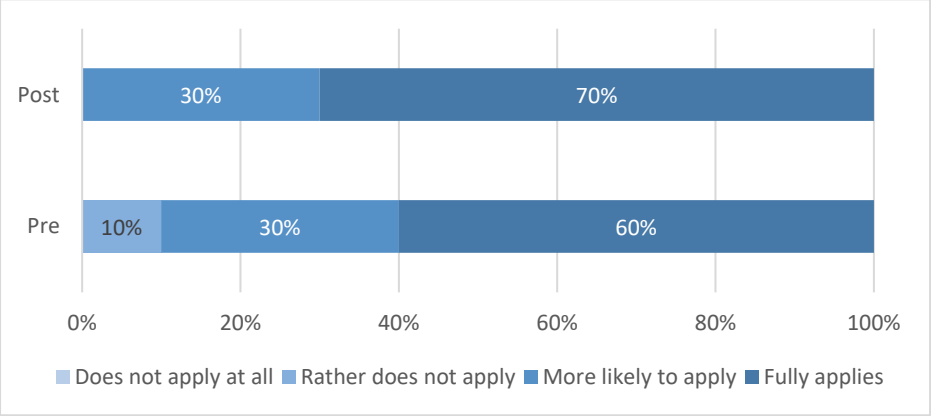


Figure 104: I expect from the course to appropriately apply instruments and methods for the analysis of clinical data. [n=10]

4.2 Course experience (learning objectives)

I know the characteristics of routine data and different methods of data collection.

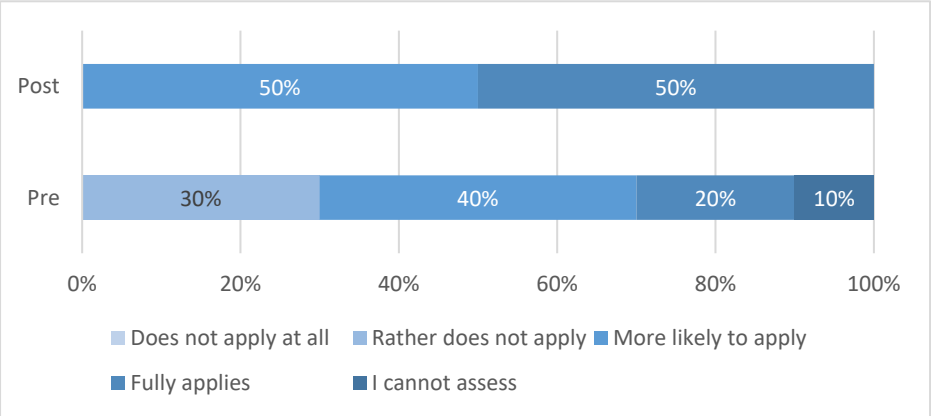


Figure 105: I know the characteristics of routine data and different methods of data collection. [n=10]

I am able to list the characteristics and differences between experimental and observational data and categorize clinical data raised in care into this context.

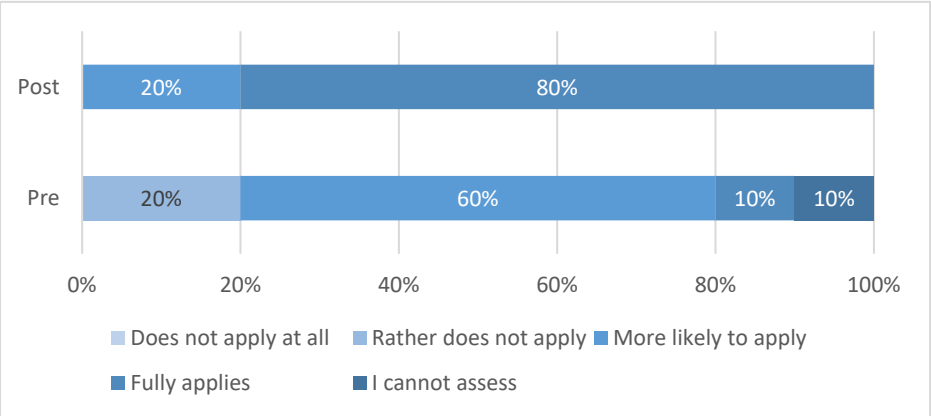


Figure 106: I am able to list the characteristics and differences between experimental and observational data and categorize clinical data raised in care into this context. [n=10]

I can define the research design of observational studies, especially retrospective case-control studies.

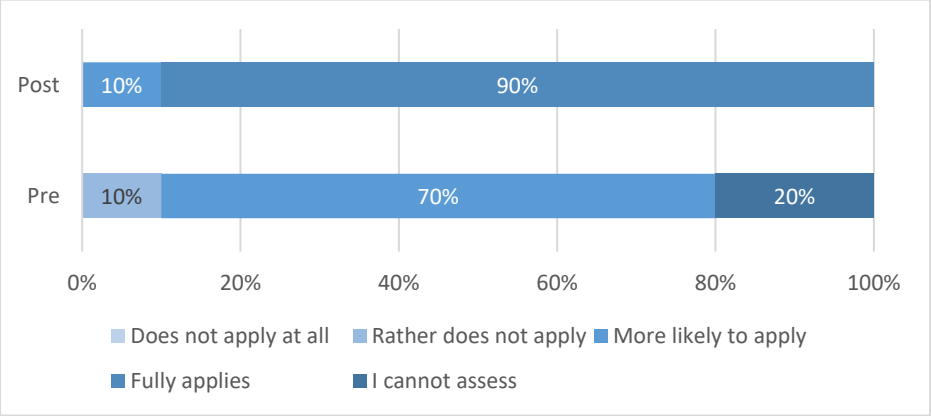


Figure 107: I can define the research design of observational studies, especially retrospective case-control studies. [n=10]

I understand and I am able to interpret linear regression models and logistic regression models and explain differences and similarities of both.

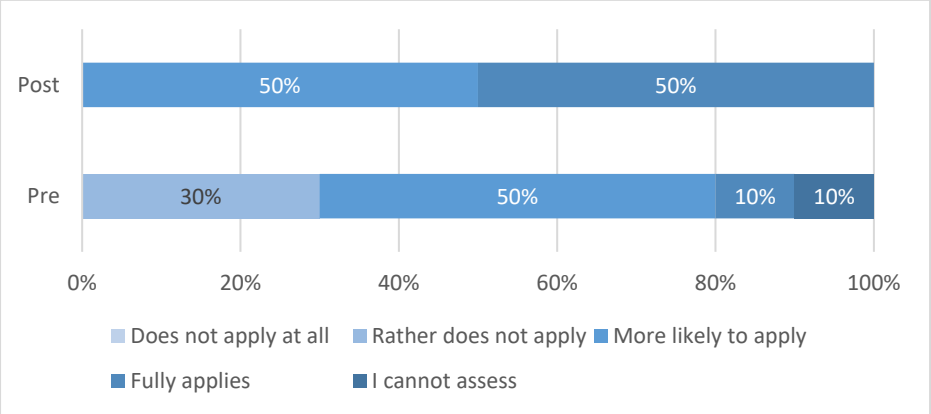


Figure 108: I understand and I am able to interpret linear regression models and logistic regression models and explain differences and similarities of both. [n=10]

I am able to outline logistic regression models for clinical observational data.

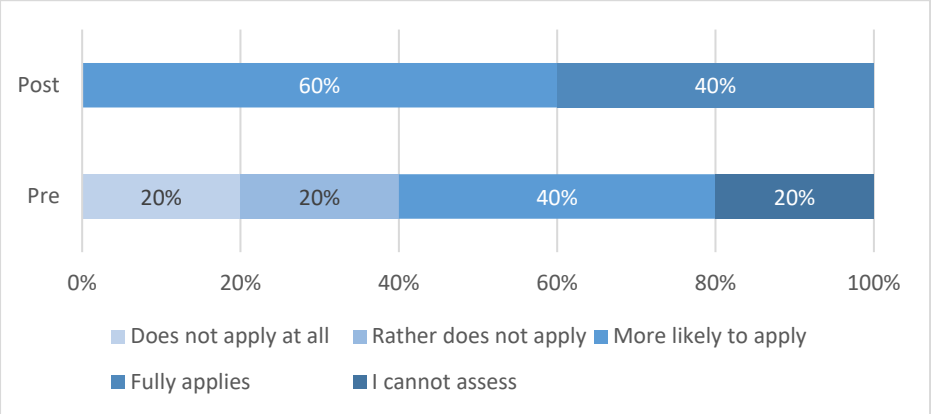


Figure 109: I am able to outline logistic regression models for clinical observational data. [n=10]

I know how to execute statistical calculations with the help of the statistics program SPSS.

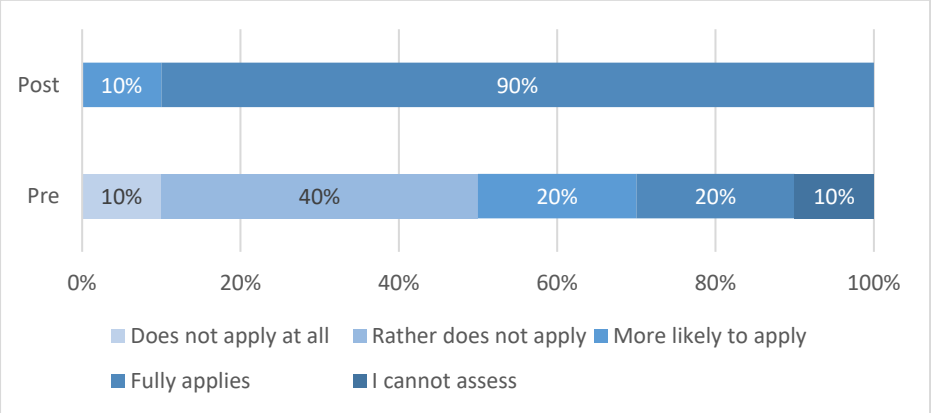


Figure 110: I know how to execute statistical calculations with the help of the statistics program SPSS. [n=10]

I am able to interpret and appraise the models with regard to their model coefficients and model quality.

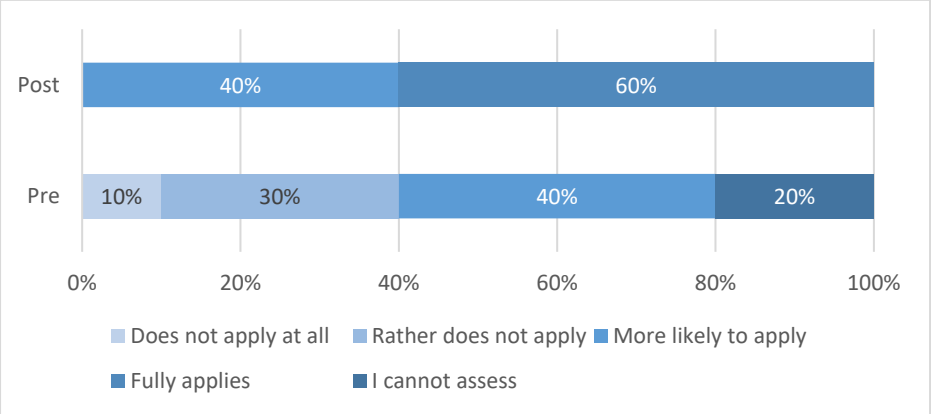


Figure 111: I am able to interpret and appraise the models with regard to their model coefficients and model quality. [n=10]

I know how to apply SPSS for logistic regression models.

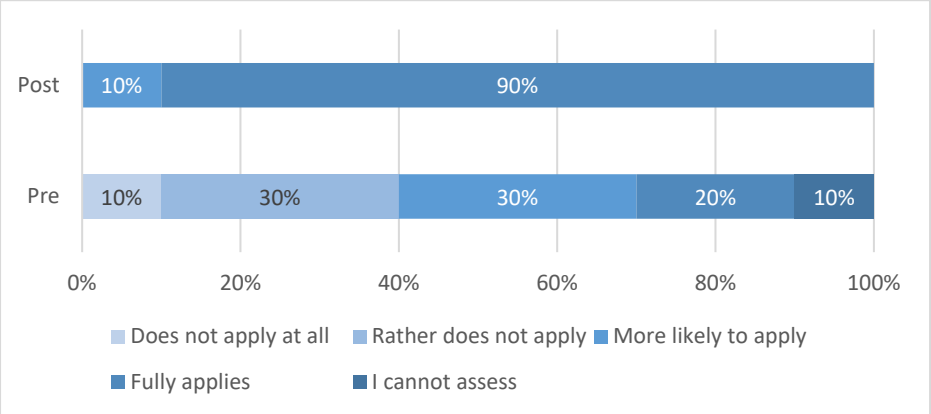


Figure 112: I know how to apply SPSS for logistic regression models. [n=10]

I am able to interpret the results of statistics analyses and models.

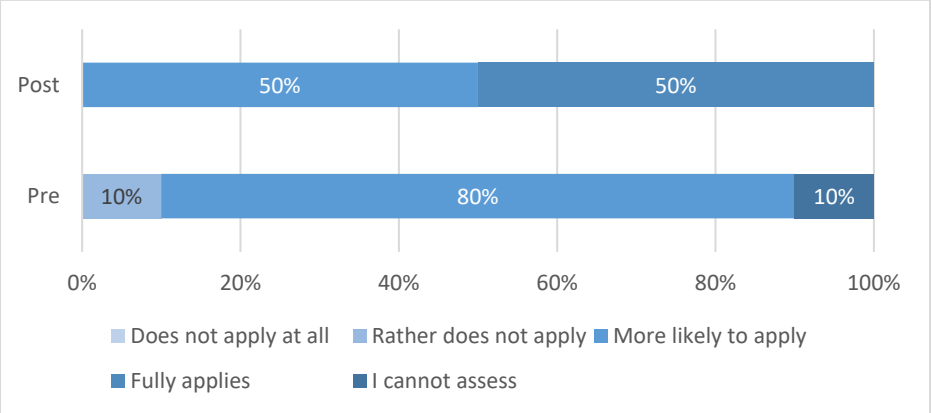


Figure 113: I am able to interpret the results of statistics analyses and models. [n=10]

I know how to explain statistical analyses for the appropriate target group.

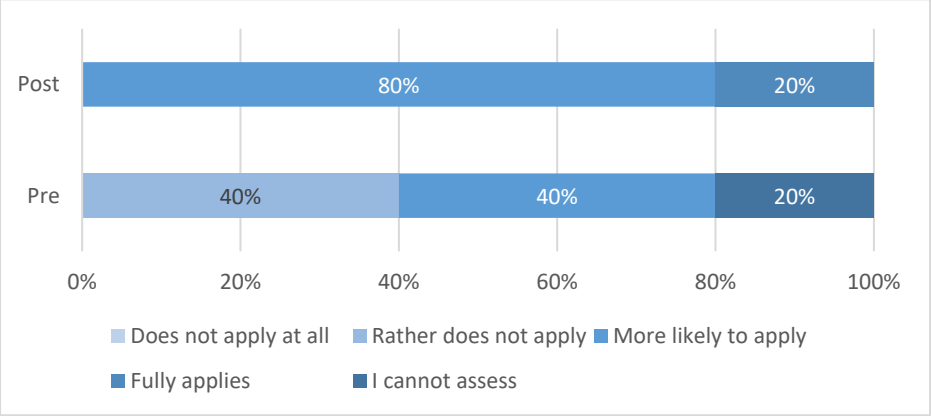


Figure 114: I know how to explain statistical analyses for the appropriate target group. [n=10]

I am able to reflect critically and interpret the model created against the background of the clinical use case.

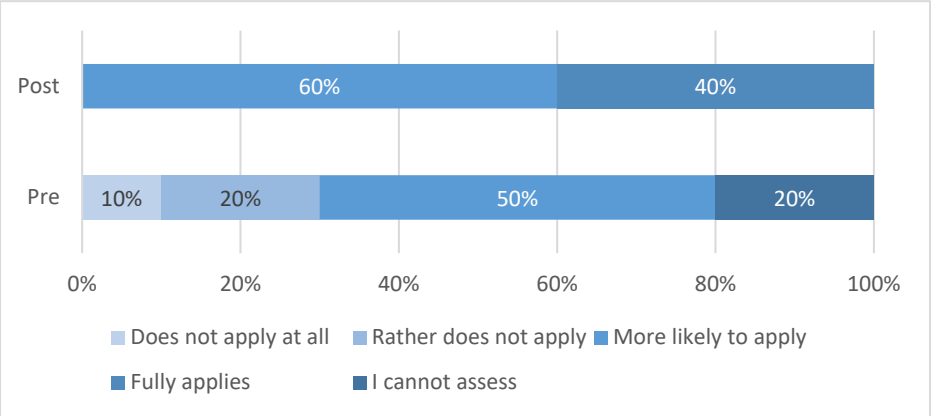


Figure 115: I am able to reflect critically and interpret the model created against the background of the clinical use case. [n=10]

I am able to appraise the context in which clinical data are generated and the research purposes for which they are used.

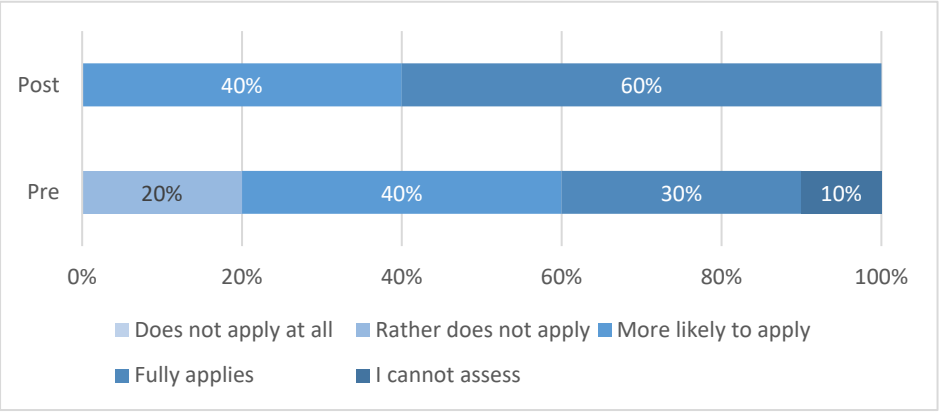


Figure 116: I am able to appraise the context in which clinical data are generated and the research purposes for which they are used. [n=10]

I know how to identify appropriate study designs and quantitative analysis methods.

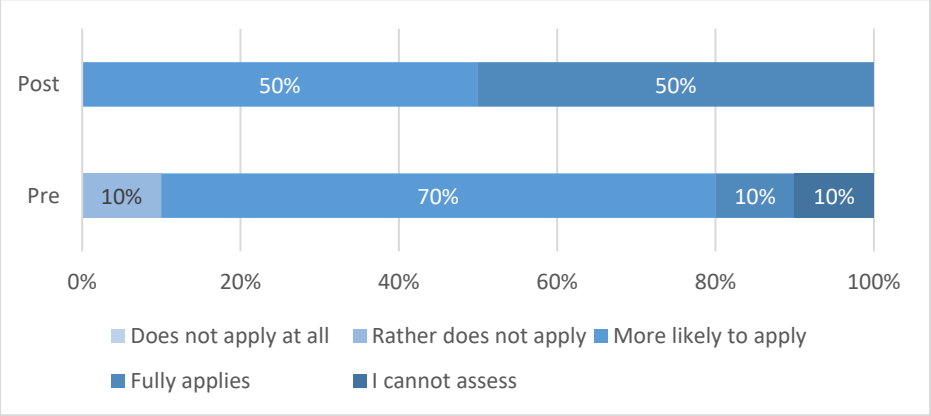


Figure 117: I know how to identify appropriate study designs and quantitative analysis methods. [n=10]

I know how to execute meaningful descriptive statistical analyses and model building for clinical data.

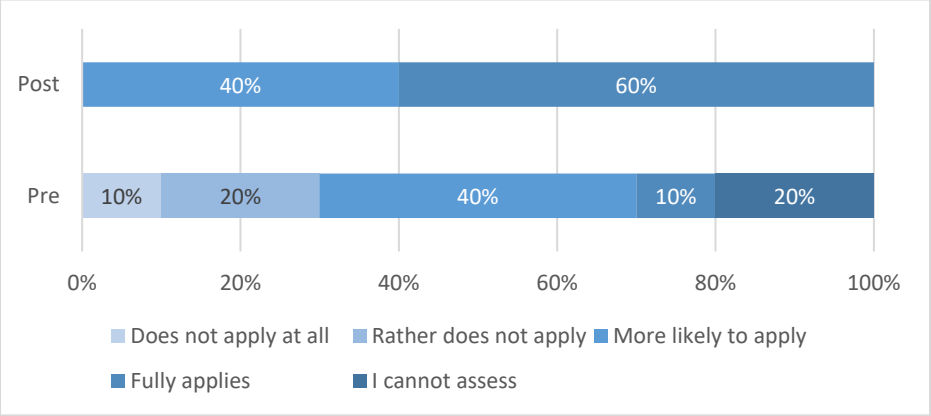


Figure 118: I know how to execute meaningful descriptive statistical analyses and model building for clinical data. [n=10]

I am able to evaluate the usefulness and validity of the created model for practical work.

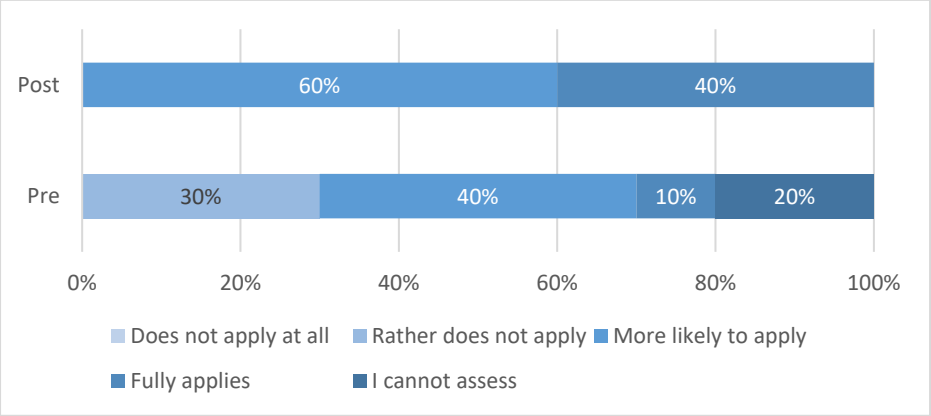


Figure 119: I am able to evaluate the usefulness and validity of the created model for practical work. [n=10]

5 Reasons for course cancellation

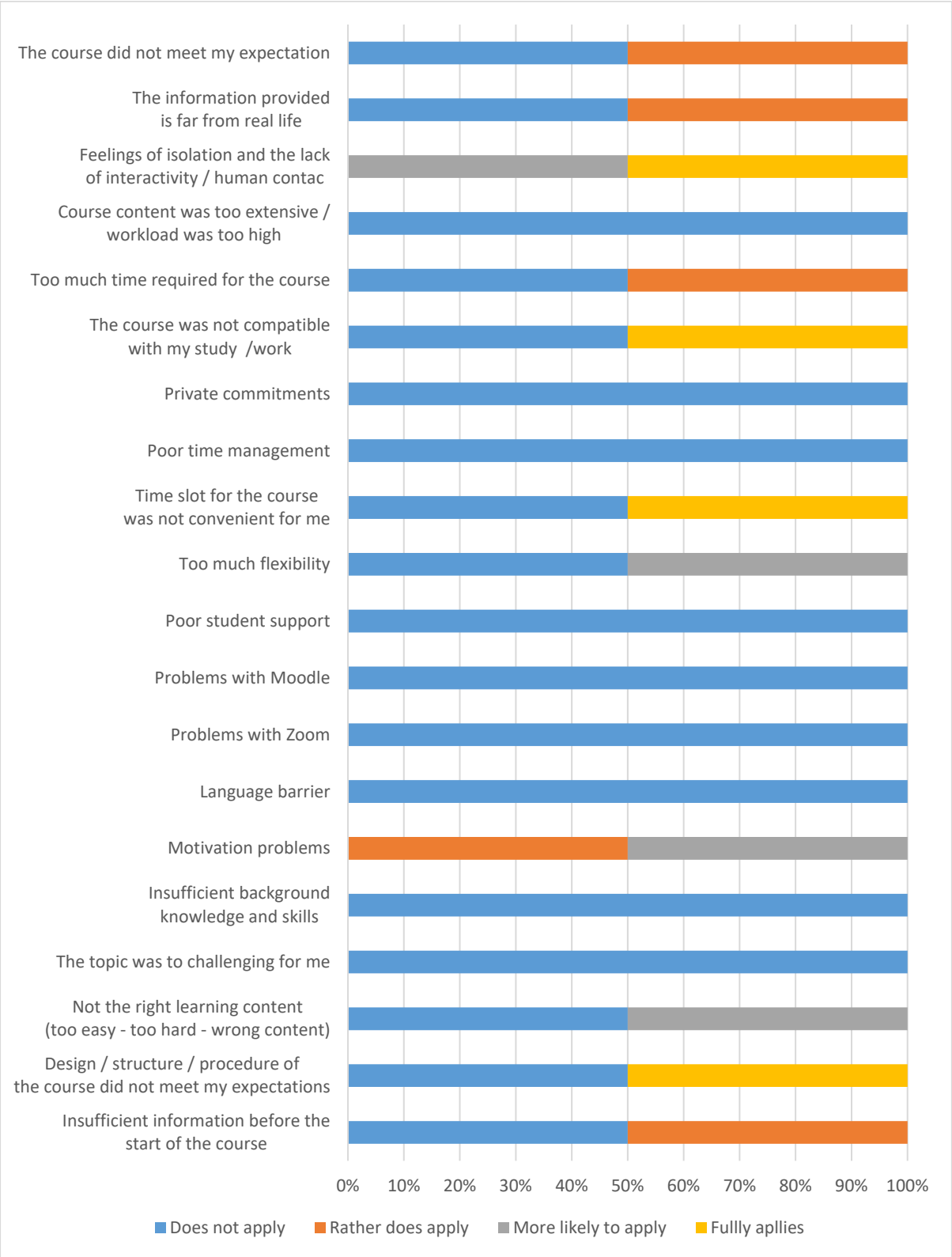


Figure 120: Reasons for course cancellation [n=2]

6 Quotes from participants

“Apart from the course content, I particularly benefited from the structure of the course and the support of the team. The structure of the course elements in the self-learning phase made it possible to learn in "small portions". I was thus able to optimally integrate the course into my everyday life. Through the possibility of self-assessment, I was able to assess well at which point it was necessary to deal more intensively with a topic. The team was always available to answer questions, which greatly supported me in my learning process. Overall, the course gave me optimal learning conditions: independent, asynchronous learning with the possibility of self-review and obtaining feedback from the team in case of uncertainties.”

“The online course was pleasantly intensive and provided really good and immediately usable knowledge. We were able to create our own predictive models such as logistic regression and learned how to interpret the model parameters and their results. This allows for predictability, which is especially crucial for clinical applications. You also get to know other colleagues* and students* of different ages and cultures. Some of the learning materials are also available on YouTube for everyone. It is one of the best designed courses I have taken.”

7 Appendix: questionnaires

Learning Healthcare in Action: Pre-Evaluation

Dear Participants,

the course Learning **Healthcare in Action: Clinical Data Analytics** is part of the research project **eHealth4all@EU - Interprofessional European eHealth Programme in Higher Education**. More information about the project can be found online at: https://www.hs-osnabrueck.de/ehealth4alleu/ (https://www.hs-osnabrueck.de/ehealth4alleu/).

The courses developed in the project will be evaluated comprehensively to check, among other things, the quality of the courses offered. Your support of this evaluation will help to continuously develop the courses and thus ensure high quality academic content. Your expectations of the course offerings are also of great interest to us in order to be able to adapt the courses to the different needs in the best possible way.

Two evaluations are planned. In addition to the present survey, you will receive another questionnaire after completing your participation and using the learning platform. We would like to evaluate some of your answers before and after the course, i.e. we will ask you these questions in the first and in the second survey.

You will also benefit from the results of the evaluation during the course of your participation, as we will already respond to your feedback during the implementation - insofar as it can be implemented immediately. All results of this survey will be published exclusively in anonymous form, so that no conclusions can be drawn about you personally.

You will need about 5 to 10 minutes to complete the questionnaire. You will find instructions on how to complete the questionnaire with the individual questions. Please make sure that you do not leave out any question. If the answer options of a question do not seem entirely appropriate to you, please tick the one that applies best to you. There are no wrong or right answers when answering the questionnaire. What counts is your personal impression and opinion.

Of course, the information you provide is voluntary and will be treated confidentially. Your data will be archived for 10 years.

If you have any questions, please contact Nicole Egbert: n.egbert@hs-osnabrueck.de (mailto:n.egbert@hs-osnabrueck.de)

Thank you for your support!

Prof. Dr. Ursula Hübner

Project Manager

Erasmus+

There are 13 questions in this survey.

Evaluation Code

We would like to evaluate some of your answers in a time comparision, i.e. we will ask you these questions in the first and in the second survey. To enable a comparison, we ask you to create a code as follows:

Description	Example		
The first two numbers of **your own birthday**	Your own birthday: **27**.03.1985	**2**	**7**
The last two letters of **your place of birth**	Your place of birth: HAMBU**RG**	**R**	**G**
The first two numbers of **your postal code**	Your postal code: **21**033	**2**	**1**

(/limesurvey30/upload/surveys/695319/images/FB_Code.png)

The code would then be as follows for the example: **27RG21**

Please enter your personal code in the line below:

*

Please write your answer here:

Experience, motivation and interests regarding the course

What motivated you to participate in this course?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
Interest in findings of current research	◯	◯	◯	◯
Interest of learning new knowledge and or/new methods	◯	◯	◯	◯
Personal development	◯	◯	◯	◯
Desire for (international) exchange with other students	◯	◯	◯	◯
Interest in (new) methods and tools for the analysis of clinical data	◯	◯	◯	◯
Learn more about the topic of data analytics	◯	◯	◯	◯

Other reasons, namely:

Please write your answer here:

Course expectations

I expect from the course, ...

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
... to gain new theoretical knowledge.	◯	◯	◯	◯
... to make new (and helpful) contacts.	◯	◯	◯	◯
... to get new knowledge for my studies.	◯	◯	◯	◯
... to receive individual support.	◯	◯	◯	◯
... to get helpful impulses for my studies.	◯	◯	◯	◯
... to be able to appropriately apply instruments and methods for the analysis of clincal data.	◯	◯	◯	◯

Other expectations, namely:

Please write your answer here:

Prior knowledge of the content of the course: Learning Healthcare in Action: Clinical Data Analytics

How do you rate the following statements for yourself?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies	I cannot assess
I know the characteristics of routine data and different methods of data collection.	◯	◯	◯	◯	◯
I am able to list the characteristics and differences between experimental and observational data and categorize clinical data raised in care into this context.	◯	◯	◯	◯	◯
I can define the research design of observational studies, especially retrospective case-control studies.	◯	◯	◯	◯	◯
I understand and I am able to interpret linear regression models and logistic regression models and explain differences and similarities of both.	◯	◯	◯	◯	◯

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies	I cannot assess
I am able outline logistic regression models for clinical observational data.	◯	◯	◯	◯	◯
I know how to execute statistical calculations with the help of the statistics program SPSS.	◯	◯	◯	◯	◯
I am able to interpret and appraise the models with regard to their model coefficients and model quality	◯	◯	◯	◯	◯
I know how to apply SPSS for logistic regression models.	◯	◯	◯	◯	◯
I am able to interpret the results of statistics analyses and models.	◯	◯	◯	◯	◯
I know how to exemplify statistical analyses for the appropriate target group.	◯	◯	◯	◯	◯
I am able to reflect critically and interpret the model created against the background of the clinical use case.	◯	◯	◯	◯	◯

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies	I cannot assess
I am able to appraise the context in which clinical data are generated and the research purposes for which they are used.	◯	◯	◯	◯	◯
I know how to identify appropriate study designs and quantitative analysis methods.	◯	◯	◯	◯	◯
In know how to execute meaningful descriptive statistical analyses and model building for clinical data.	◯	◯	◯	◯	◯
I am able to evaluate the usefulness and validity of the created model for practical work.	◯	◯	◯	◯	◯

Personal information

Please specify your age. *

Choose one of the following answers
Please choose **only one** of the following:

◯ < 25 years
◯ 25 - 35 years
◯ > 35 years

Please indicate your gender. *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Female
- ◯ Male
- ◯ Inter/divers

At which university do you study? *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Osnabrück University of Applied Sciences
- ◯ Osnabrück University
- ◯ University of Eastern Finland
- ◯ University of Porto
- ◯ Other [ ]

In which degree program are you currently studying? *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Bachelor
- ◯ Master
- ◯ Doctoral studies
- ◯ Other [ ]

Which is your field of study? *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Nursing
- ◯ Medicine
- ◯ Physiotherapy
- ◯ Midwifery
- ◯ Psychotherapy
- ◯ Health sciences
- ◯ Computer sciences
- ◯ Engineering
- ◯ Law
- ◯ Management
- ◯ Other [ ]

Have you had participated previously in distant learning courses (besides any forced by the restriction of pandemics)? *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Yes
- ◯ No

Here is space for your comments and additions that remained open for you.

Please write your answer here:

Thank you very much for your time and support!

Submit your survey.
Thank you for completing this survey.

Learning Healthcare in Action: Post-Evaluation

Dear participants,

Now that you have successfully completed the course, we would like to know something about your experience with the course offering.

The results of this survey will, of course, be published exclusively in anonymized form, so that no conclusions can be drawn about you personally.

In order to compare the results with your expectations, we would like to ask you to generate the same code as in the first evaluation survey. This does not allow any conclusions to be drawn about your person.

You will need about 10 to 15 minutes to complete the questionnaire. You will find instructions for filling out the questionnaire with the corresponding questions. Please make sure that you do not leave out any question. If the answer options of a question do not seem entirely appropriate to you, please tick the one that applies most closely. What counts is your personal impression and opinion.

Of course, the information you provide is voluntary and will be treated confidentially. Your data will be archived for 10 years.

If you have any questions, please contact Nicole Egbert: n.egbert@hs-osnabrueck.de (mailto:n.egbert@hs-osnabrueck.de)

Thank you for your support!

Prof. Dr. Ursula Hübner

Project Manager

Erasmus+

There are 13 questions in this survey.

Evaluation Code

In order to compare the results with your expectations, we would like to ask you to generate the same code as in the first evaluation survey. This does not allow any conclusions to be drawn about your person.

Description	Example		
The first two numbers of **your own birthday**	Your own birthday: **27**.03.1985	**2**	**7**
The last two letters of **your place of birth**	Your place of birth: HAMBU**RG**	**R**	**G**
The first two numbers of **your postal code**	Your postal code: **21**033	**2**	**1**

(/limesurvey30 /upload/surveys/695319/images/FB_Code.png)

The code would then be as follows for the example: **27RG21**

Please enter your personal code in the line below:

*

Please write your answer here:

Your course participation

How do you evaluate the setting and the process of the course?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
The instructors responded well to the different needs of the participants.	◯	◯	◯	◯
The instructors ensured that participants remained active and engaged in a productive dialogue.	◯	◯	◯	◯
The level of difficulty of the course was appropriate.	◯	◯	◯	◯
The amount of content was appropriate	◯	◯	◯	◯
The learning objectives of the course were clear.	◯	◯	◯	◯
Learning objectives set for the course were realistic.	◯	◯	◯	◯
I set my own learning objectives for this course.	◯	◯	◯	◯

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
I reflected my own learning objectives to the course learning objectives.	◯	◯	◯	◯
I had the opportunity to reflect on what I have learned.	◯	◯	◯	◯

Evaluation of personal benefit and practical relevance

Contents and learning material

How do you rate the following statements?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
Attending the course was worthwhile for me personally.	◯	◯	◯	◯
I was aware of central course contents.	◯	◯	◯	◯
My understanding of the course topic has evolved through participation.	◯	◯	◯	◯
The relation between theory and practice was shown.	◯	◯	◯	◯
The course content and learning materials supported me in deep learning.	◯	◯	◯	◯
The contents of course were appropriate compared to my previous knowledge.	◯	◯	◯	◯
The level of course was appropriate compared to my previous knowledge.	◯	◯	◯	◯

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
I was able to take advantage of what I have learned earlier about this topic.	◯	◯	◯	◯
I think I will still be able to report what I learned some time after the course was offered.	◯	◯	◯	◯

Learning process and teaching methods

How do you rate the following statements?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
The teaching methods suited well to achieve the learning objectives set for the course.	◯	◯	◯	◯
Course planning proved teacher`s expertise of the teaching methods and learning.	◯	◯	◯	◯
I took responsibility for my own learning, I was active and motivated.	◯	◯	◯	◯
I pointed out my motivation to understand and develop my own learning in the course.	◯	◯	◯	◯

Self-learning phase

How do you rate the following statements?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
The scope of the self-learning phase was appropriate.	◯	◯	◯	◯
The tasks were understandable.	◯	◯	◯	◯
The time frame for completing the assignments was reasonable.	◯	◯	◯	◯

Case-based/problem-based learning

How do you rate the following statements?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
The self-directed learning based on the case studies suited me.	◯	◯	◯	◯
The online discussions were useful for me to understand different perspectives.	◯	◯	◯	◯
The course dealt with real problem situations and everyday situations related to the subject to be studied.	◯	◯	◯	◯
I researched and used various sources to answer the learning objectives.	◯	◯	◯	◯

Moodle/e-learning

How do you rate the following statements?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
The Moodle learning platform is user-friendly.	◯	◯	◯	◯
The information I was looking for is easy to find in Moodle	◯	◯	◯	◯
The content in Moodle is presented in a comprehensible way.	◯	◯	◯	◯
Finding my way through Moodle was easy.	◯	◯	◯	◯
It took more time to work with Moodle than I expected.	◯	◯	◯	◯
I felt comfortable communicating online.	◯	◯	◯	◯
I received helpful support with technical questions.	◯	◯	◯	◯
The learning platform supported the exchange with the other participants.	◯	◯	◯	◯

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
The teacher guided studying and learning expertly in e-learning/ Moodle environment.	◯	◯	◯	◯
I used the e-learning environment/ Moodle in that way teacher guided.	◯	◯	◯	◯
Studying in the online course has improved my skills to use information and communication technology.	◯	◯	◯	◯
The online environment/Moodle helped me improve my teamwork skills.	◯	◯	◯	◯

Your expectations of the course

Which of your expectations have been met?

Through the course, I have ...

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
… gained new theoretical knowledge.	◯	◯	◯	◯
… made new (and helpful) contacts.	◯	◯	◯	◯
… gained new knowledge for my studies.	◯	◯	◯	◯
… received individual support.	◯	◯	◯	◯
… got helpful impulses for my studies.	◯	◯	◯	◯
… appropriately applied instruments and methods for the analysis of clinical data.	◯	◯	◯	◯

Experience with the course

How do you rate the following statements?

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies	I cannot assess
I know the characteristics of routine data and different methods of data collection.	◯	◯	◯	◯	◯
I am able to list the characteristics and differences between experimental and observational data and categorize clinical data raised in care into this context.	◯	◯	◯	◯	◯
I can define the research design of observational studies, especially retrospective case-control studies.	◯	◯	◯	◯	◯
I understand and I am able to interpret linear regression models and logistic regression models and explain differences and similarities of both.	◯	◯	◯	◯	◯

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies	I cannot assess
I am able to outline logistic regression models for clinical observational data.	◯	◯	◯	◯	◯
I know how to execute statistical calculations with the help of the statistics program SPSS.	◯	◯	◯	◯	◯
I am able to interpret and appraise the models with regard to their model coefficients and model quality.	◯	◯	◯	◯	◯
I know how to apply SPSS for logistic regression models.	◯	◯	◯	◯	◯
I am able to interpret the results of statistics analyses and models.	◯	◯	◯	◯	◯
I know how to explain statistical analyses for the appropriate target group.	◯	◯	◯	◯	◯
I am able to reflect critically and interpret the model created against the background of the clinical use case.	◯	◯	◯	◯	◯

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies	I cannot assess
I am able to appraise the context in which clinical data are generated and the research purposes for which they are used.	◯	◯	◯	◯	◯
I know how to identify appropriate study designs and quantitative analysis methods.	◯	◯	◯	◯	◯
I know how to execute meaningful descriptive statistical analyses and model building for clinical data.	◯	◯	◯	◯	◯
I am able to evaluate the usefulness and validity of the created model for practical work.	◯	◯	◯	◯	◯

Your overall assessment

Plase rate the following aspects on the quality of the concept of the course.

Please mark the appropriate answer category for each answer option.

*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does apply	More likely to apply	Fully applies
I would recommend the course to other students/professionals.	◯	◯	◯	◯
From my point of view, there was a good balance between effort and benefit of the course.	◯	◯	◯	◯
From my point of view, such course offerings are very well suited to increase competencies in the area of clinical data analytics.	◯	◯	◯	◯

How long did it take you to complete the self-learning material?

Please estimate the total time required and enter the number of hours.

*

Please write your answer here:

Which technical device did you mainly use to work on the e-learning content? *

Please choose **only one** of the following:

- ◯ PC / laptop
- ◯ tablet
- ◯ mobile device

Here is space for your comments.

Please write your answer here:

Thank you very much for your time and support!

06.09.2021 – 07:35

Submit your survey.
Thank you for completing this survey.

Online-Course Learning Healthcare in Action: course cancellation

Dear all,

You participated in the Kick-Off of the international online course "Learning Healthcare in Action: Clinical Data Analytics" on June 17-18, 2021. Since you did not participate in the subsequent self-study phase as well as the virtual Summer School in August, we are approaching you today to ask about your reasons for cancelling the course. With your answer you can help us for future planning and support us in the further development of the courses.

You will need about 5 minutes to complete the questionnaire. You will find instructions for filling out the questionnaire with the corresponding questions. Please make sure that you do not leave out any question. If the answer options of a question do not seem entirely appropriate to you, please tick the one that applies most closely. What counts is your personal impression and opinion.

Of course, the information you provide is voluntary and will be treated confidentially. Your data will be archived for 10 years.

If you have any questions, please contact Nicole Egbert: n.egbert@hs-osnabrueck.de (mailto:n.egbert@hs-osnabrueck.de)

Thank you for your support!

Prof. Dr. Ursula Hübner

Project Manager

Erasmus+

There are 2 questions in this survey.

Reasons for cancelling the course

To what extent did the following reasons contribute to you not completing or being able to complete the course?

Please mark the appropriate answer category for each answer option.
*

Please choose the appropriate response for each item:

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
Insufficient information before the start of the course	◯	◯	◯	◯
Design / structure / procedure of the course did not meet my expectations	◯	◯	◯	◯
Not the right learning content (too easy - too hard - wrong content)	◯	◯	◯	◯
The topic was to challenging for me	◯	◯	◯	◯
Insufficient background knowledge and skills	◯	◯	◯	◯
Motivation problems	◯	◯	◯	◯
Language barriers	◯	◯	◯	◯
Technical problems	◯	◯	◯	◯
Problems with Zoom	◯	◯	◯	◯
Problems with Moodle	◯	◯	◯	◯
Poor student support	◯	◯	◯	◯
Too much flexibility	◯	◯	◯	◯

	Does not apply at all	Rather does not apply	More likely to apply	Fully applies
Time slot for the course was not convenient for me	◯	◯	◯	◯
Poor time management	◯	◯	◯	◯
Private commitments	◯	◯	◯	◯
The course was not compatible with my study /work	◯	◯	◯	◯
Too much time required for the course	◯	◯	◯	◯
Course content was too extensive / workload was too high	◯	◯	◯	◯
Feelings of isolation and the lack of interactivity / human contact	◯	◯	◯	◯
The information provided is far from real life	◯	◯	◯	◯
The course did not meet my expectations	◯	◯	◯	◯

Other reasons:

Please write your answer here:

Thank you very much for your time and support!

Submit your survey.
Thank you for completing this survey.

Evaluation

Evaluation of the course Learning Healthcare in Action: Data protection and security

Authors: Tiina Jokinen, Johanna Ikonen, Ulla-Mari Kinnunen, Kaija Saranto

University of Eastern Finland

Co-funded by the Erasmus+ Programme of the European Union

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1 Introduktion

The course “Data Protection and Security” teaches participants to understand what confidentiality, integrity and safety means when processing personal related data. The goal of the course is to participants to learn basic concepts of data privacy and security. Learning goals also is to understand data subject`s rights and to understand meaning of consent in healthcare. Course participants learn data protection actors and their roles in data protection in healthcare context. They also understand meaning of data controller, personal data processor and data protection ombudsman`s role.

Participants will learn to understand legal and ethical requirements of data protection. They also learn to understand health applications data protection and security, understand risk management role in data protection and security.

The first run of online course took place between 14.9. – 17.11.2021. There were six parts to the course: Kick-Off 14.9 - 15.9.2021, Introduction 14.9. -5.10.2021, Data Protection legislation 27.9. – 10.10.2021, Data Protection actors 11.10. – 24.10.2021, Confidentiality, secrecy and patient information 25.10. – 2.11.2021 and Risk management in healthcare 1.11. - 17.11.2021.

The results of the pre-evaluation are presented in chapter 2, and the results of the post-evaluation are presented in chapter 3. Open answers are summarized, and some parts of responses are hidden by XX to the protection respondents’ anonymity.

2 Pre-Evaluation Results

2.1 Background, motivation and expectations

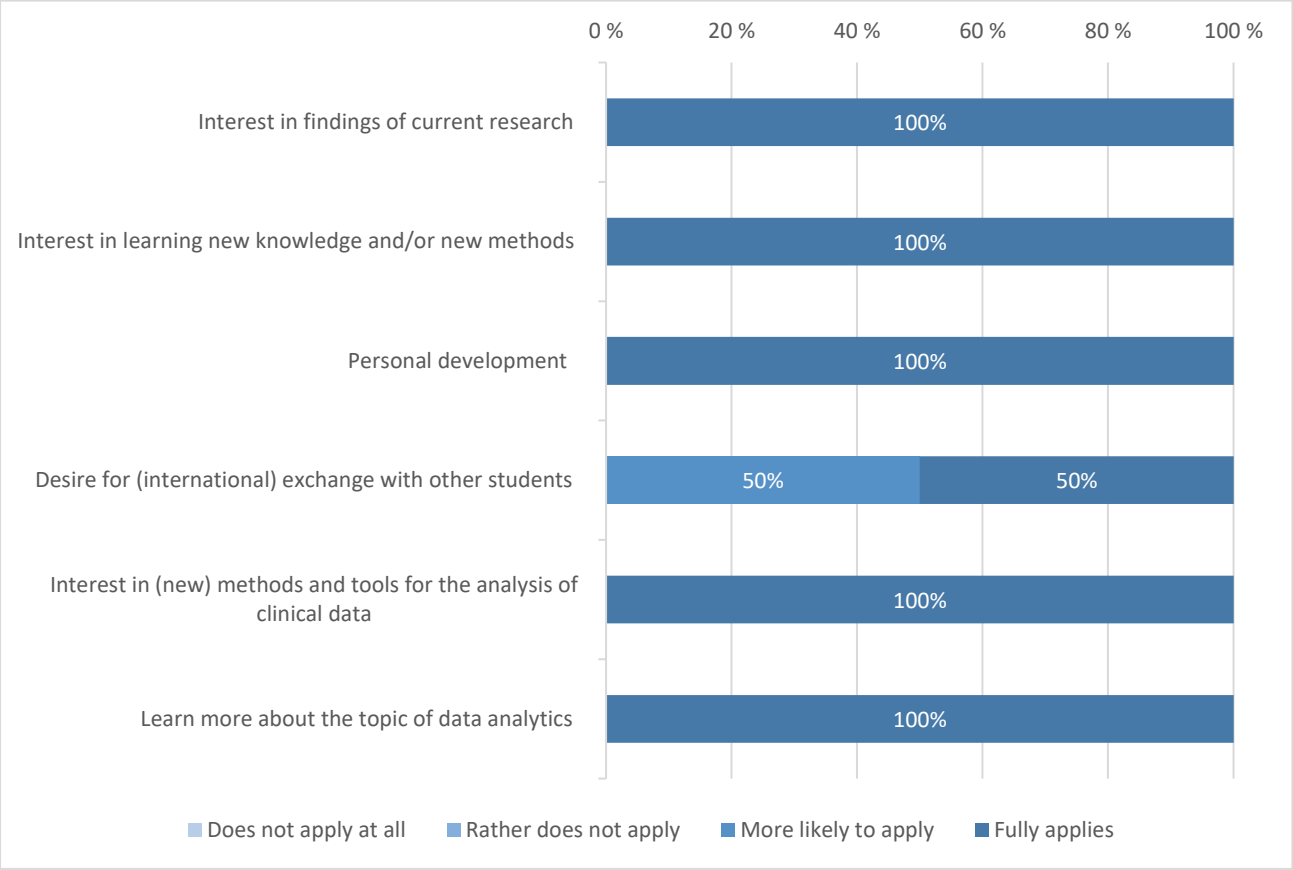

Figure 1: Background, motivation and expectations [n=2]

Other reasons, namely (n=0)

2.2 Course expectations

I expect from the course, …

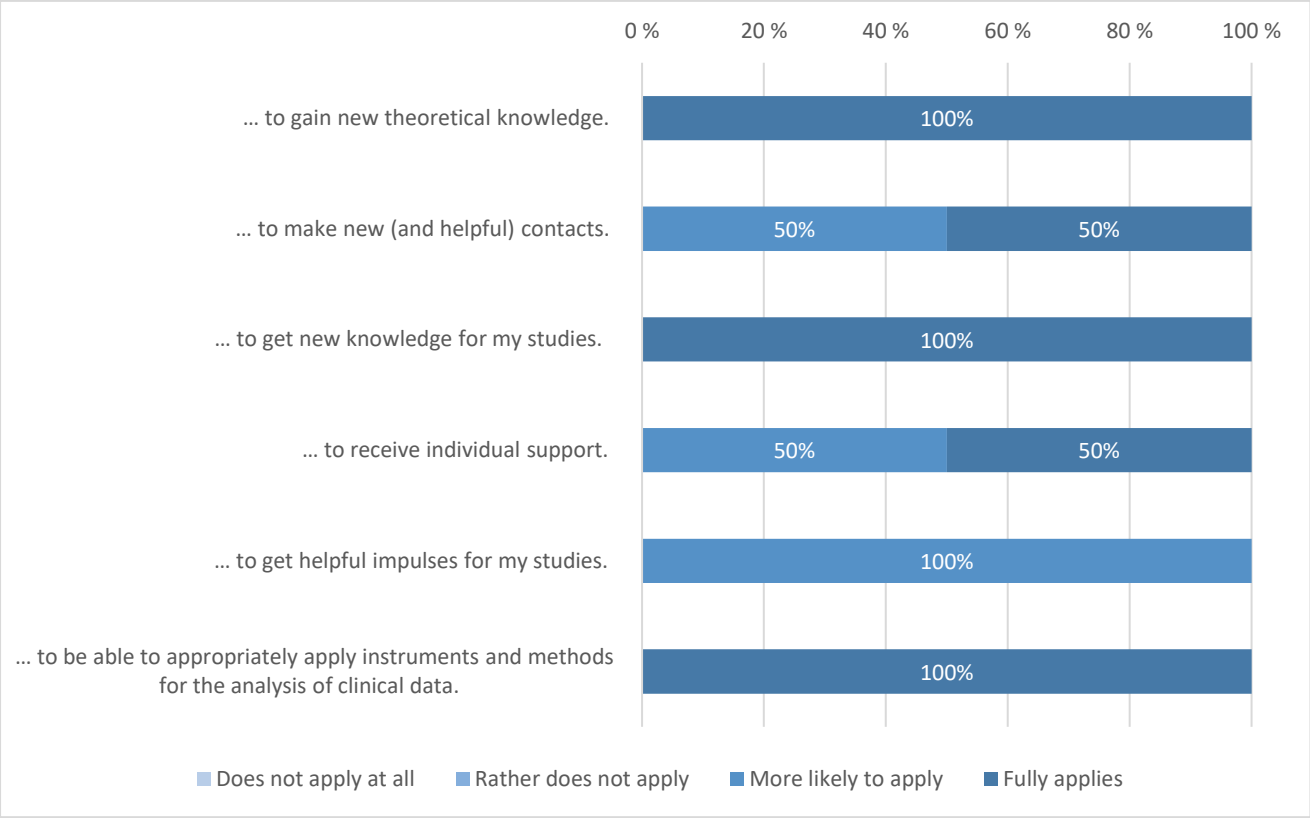

Figure 2: Course expectations [n=2]

Other expectations, namely (n=0)

2.3 Prior knowledge of the content of the course: Learning Healthcare in Action: Data protection and security

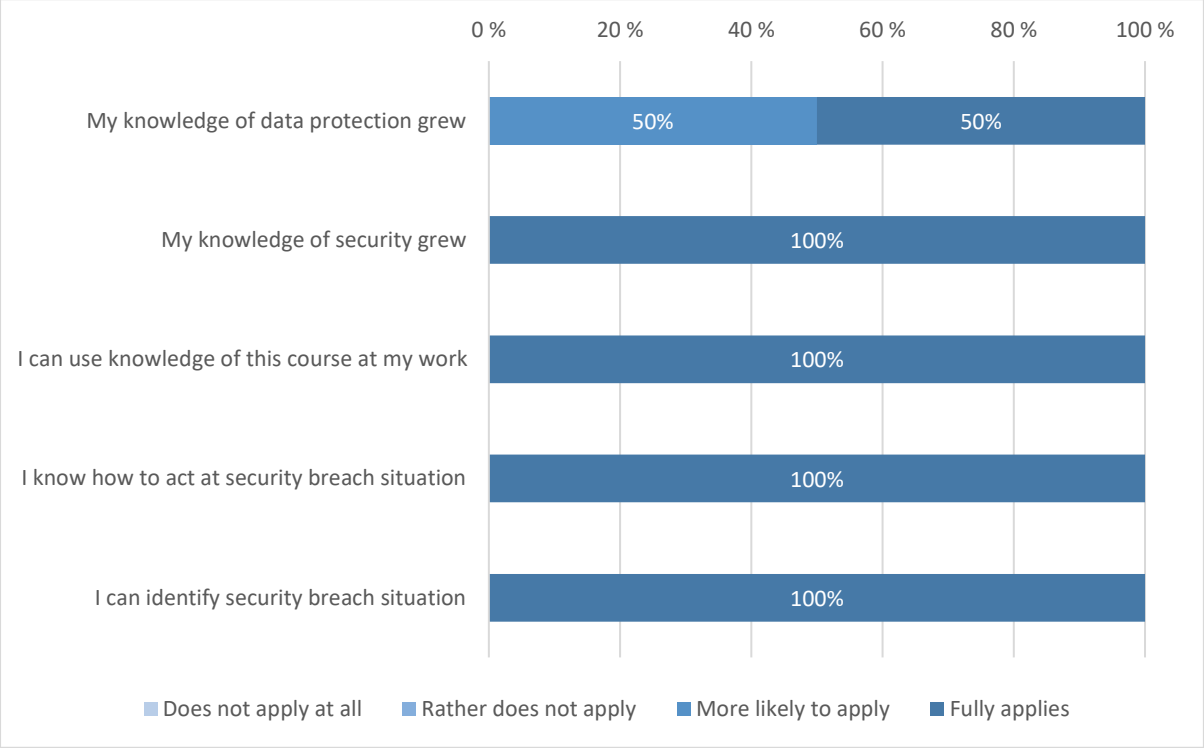

Figure 3: Prior knowledge of the content of the course [n = 2]

2.4 Personal information

Age (n = 2)

- Over 35 years

Gender (n = 2)

- man

University (n = 2)

- University of XX
-

Study degree (n = 2)

- doctoral studies

Field of study (n = 2)

- nursing
- management

Here is space for your comments. (n = 1)

- I look forward to the challenges which the course poses and how i can overcome them

3 Post-Evaluation Results

3.1 Course participation

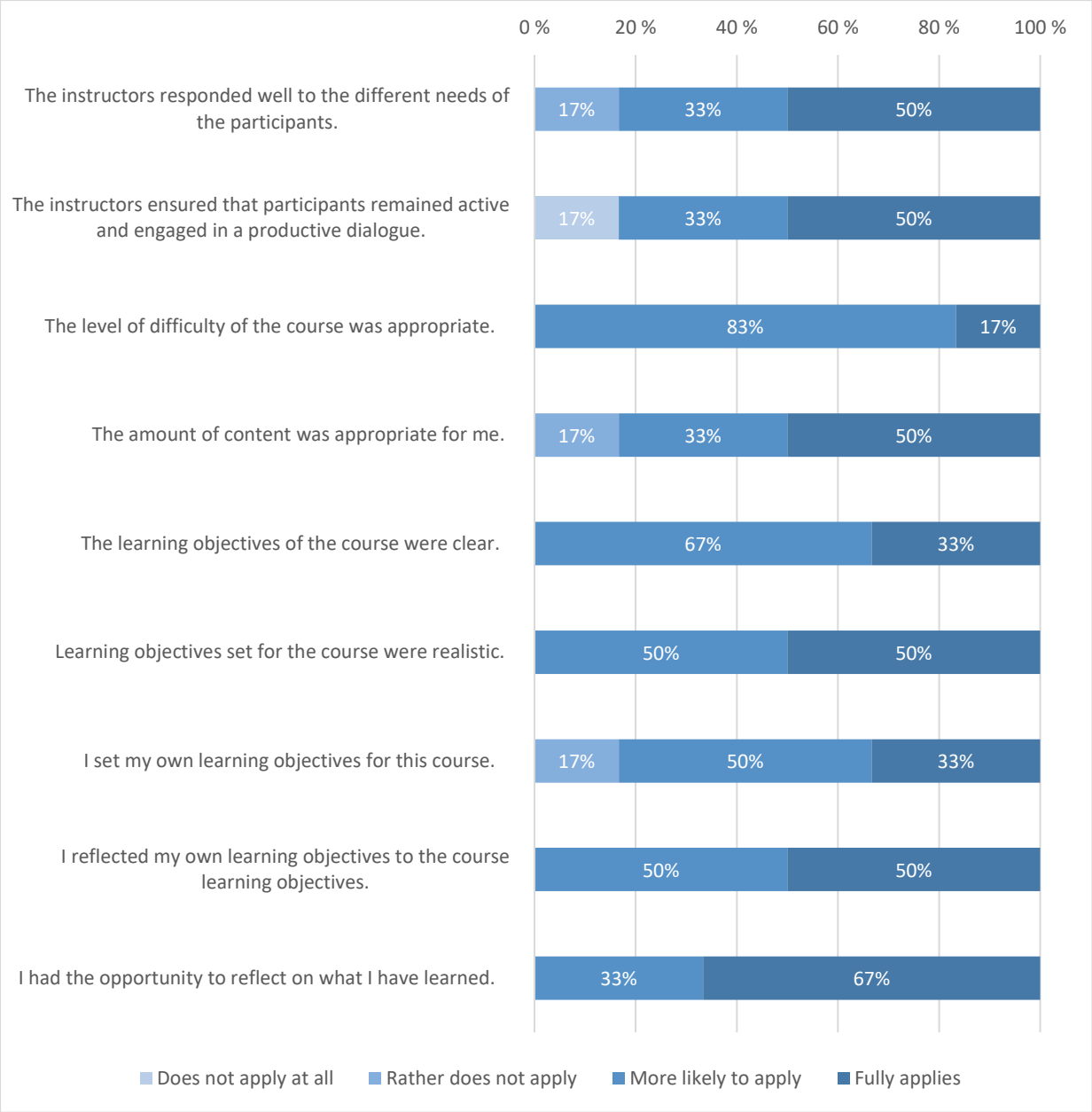

Figure 4: Course participation [n = 6]

3.2 Evaluation of the personal benefit and practical relevance

Contents and learning material

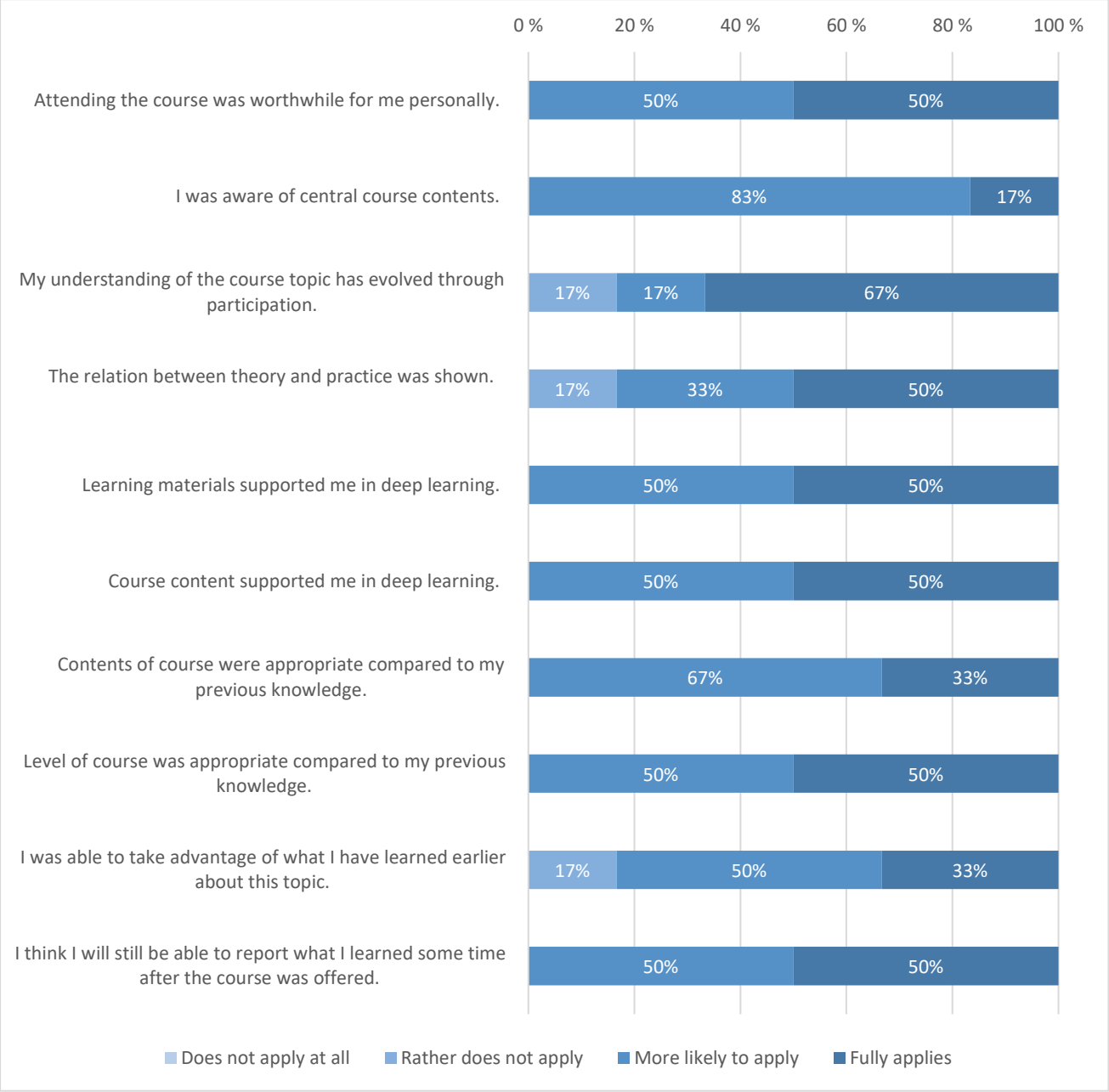

Figure 5: Contents and learning material [n = 6]

Learning process and teaching methods

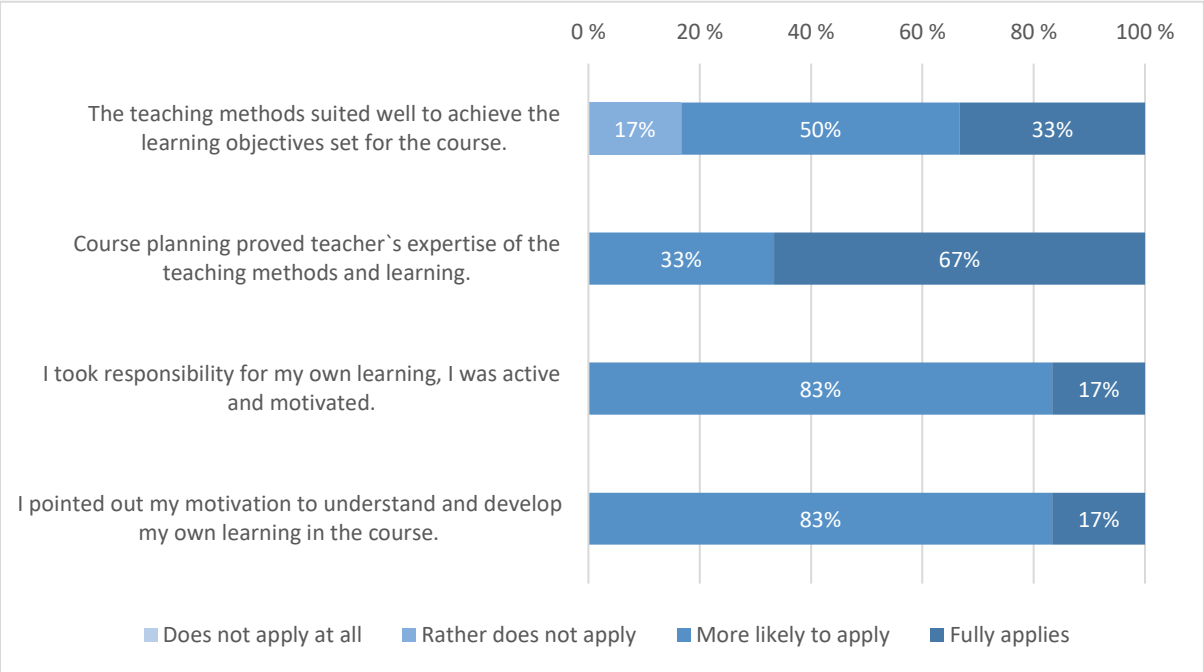

Figure 6: Learning process and teaching methods [n = 6]

Self-learning phase

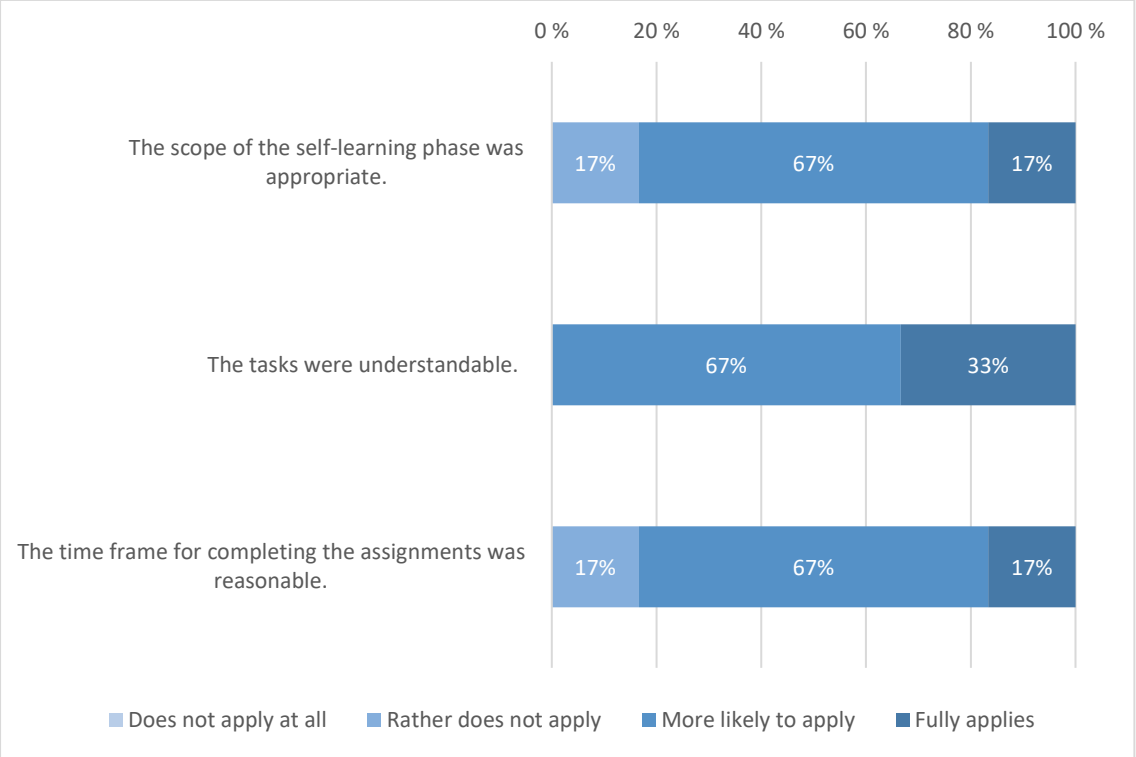

Figure 7: Self-learning phase [n = 6]

Case-based/problem-based learning

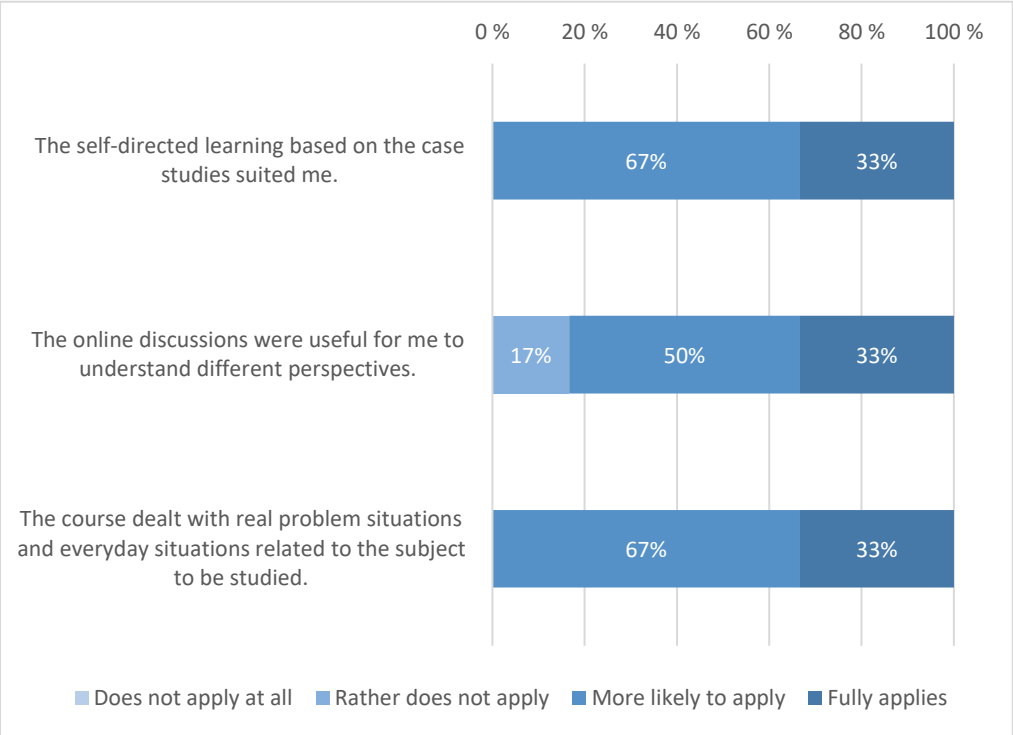

Figure 8: Case-based/problem-based learning [n = 6]

Moodle/e-Learning

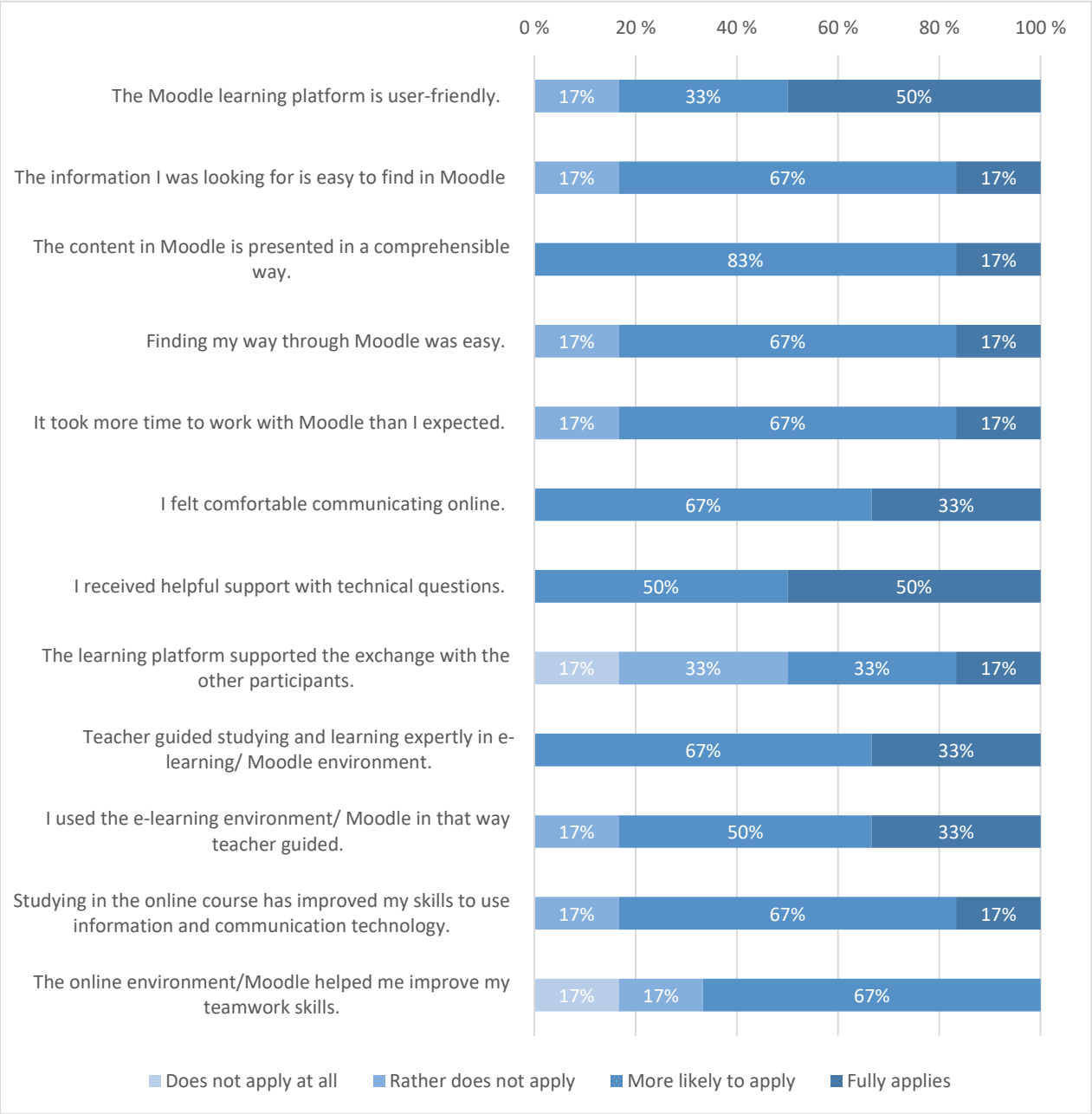

Figure 9: Moodle/e-Learning [n = 6]

3.3 Course expectations

Through the course, I have …

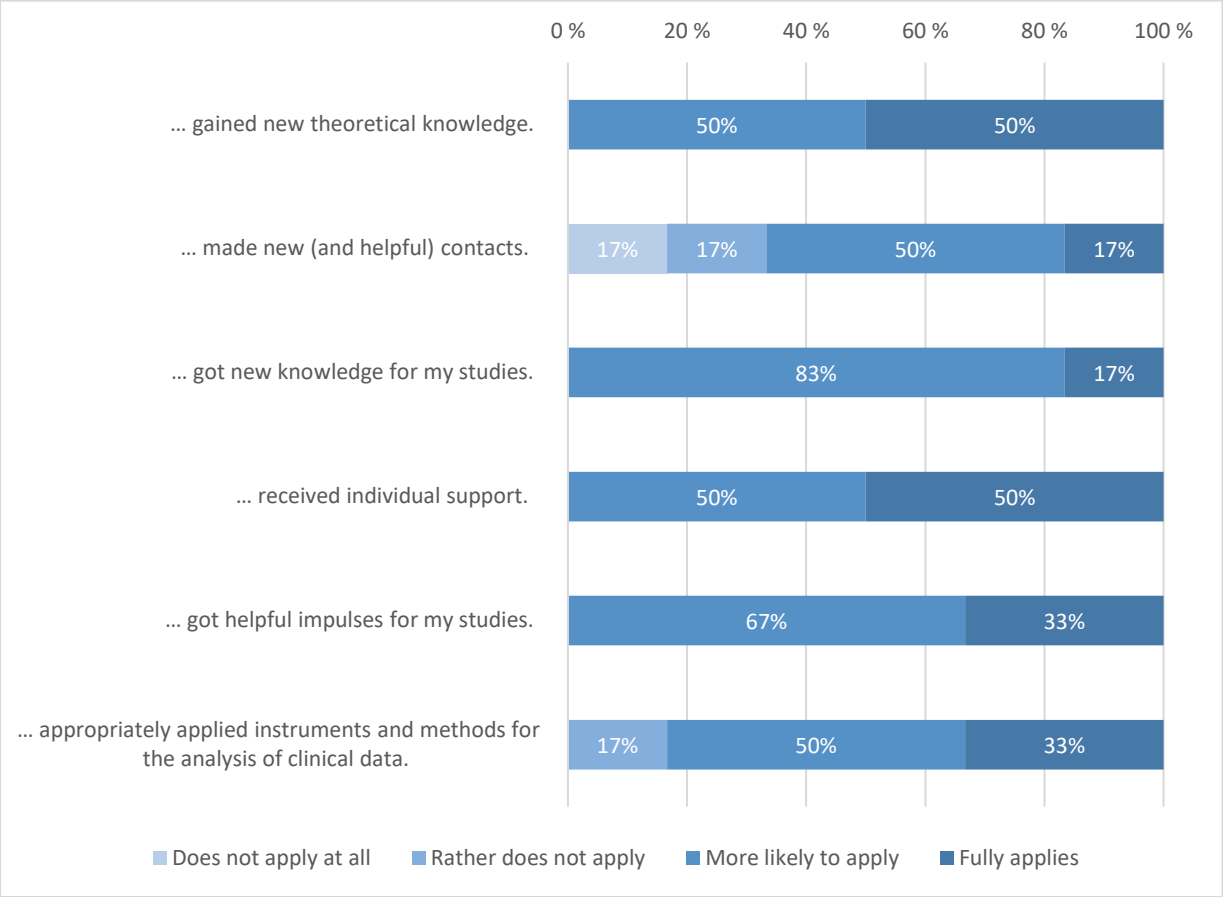

Figure 10: Course expectations [n = 6]

3.4 Experience from the course

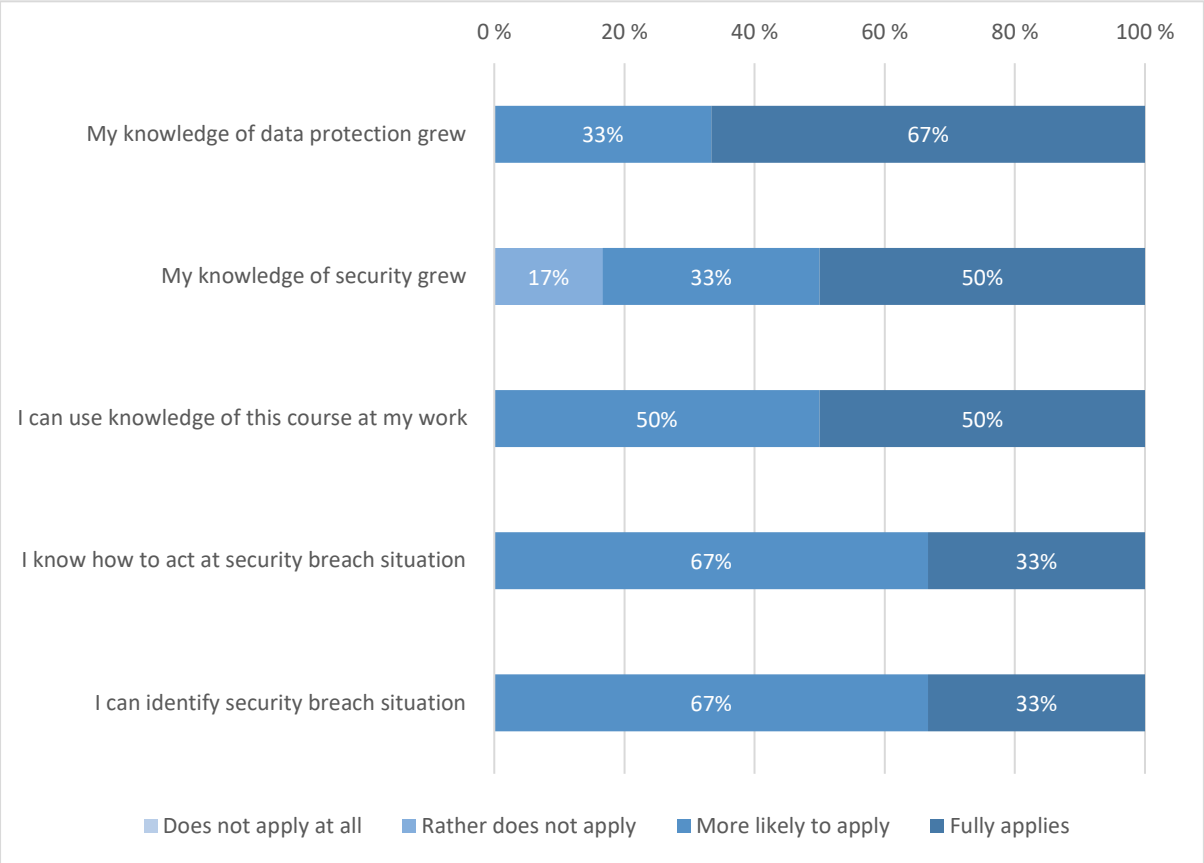

Figure 11: Experience with the course [n = 6]

3.5 Overall assessment

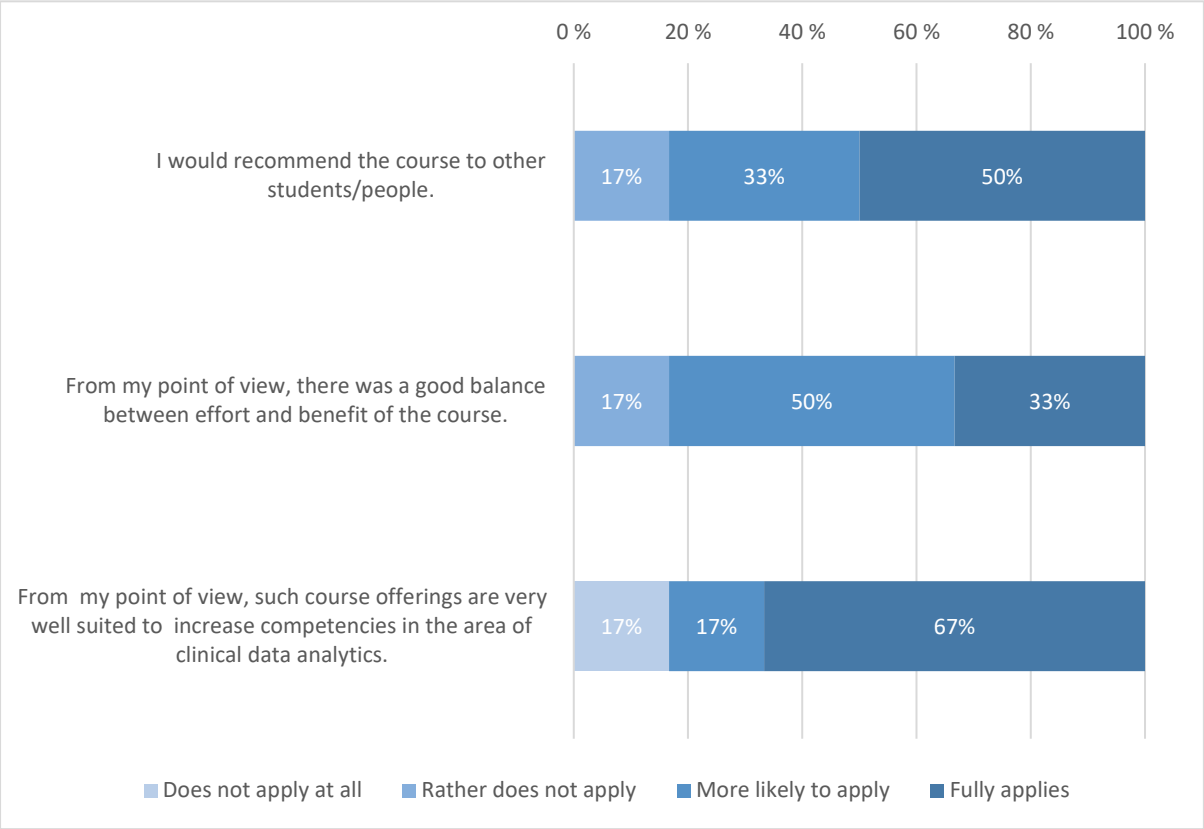

Figure 12: Overall assessment [n = 6]

How long did it take you to complete the self-learning material? (n = 6)

- 12
- 40
- 8
- 40
- 12
- 20

Mean 22

Which technical device did you use to work on the e-learning content? (n = 6)

- PC/laptop (n=5)
- tablet (n=1)

Comments (n = 2)

- Thank you for the course
  Thank you for the course! The topic of course was very interesting. At some point, implementation of the course was a little bit unclear, for the reason instructions changed a bit during the course. Anyway, big picture was nice and there were good lecturers.

Evaluation

Evaluation of the course Learning Healthcare in Action: Interoperability

Authors: Pedro Vieira-Marques; Ricardo Correia

University of Porto

Co-funded by the Erasmus+ Programme of the European Union

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1 Introduction

The course “Learning healthcare in action – Interoperability” will provide participants with a perspective of the broad spectrum of problems in the field of Health Information Systems interoperability, its implications in Healthcare and paths that promote coherent and safe information exchange.

The course aims to show participants how standards play an essential role in fostering interoperability. It will provide a hands-on approach, creating the opportunity for students to experience scenarios where information exchange occurs and putting them in the driver's seat while reaching for a solution.

The first run of this online course took place between 29 November 2021 to 23th Jannuary 2022. There were there phases to the course: Kick-Off Meeting, Self-learning and Virtual European Summer School (see figure 1).

Two surveys were conducted as part of the course, a pre-survey before the course started and a survey after the course was completed. The aim of the surveys was to determine the quality of the course in order to be able to make adjustments and obtain important findings for revising the course for further implementations. In the pre-evaluation, the expectations and previous knowledge of the participants were also queried in order to be able to react to the needs already during the course.

The results of the pre-evaluation are presented in chapter 2, and the results of the post-evaluation are presented in chapter 3. Pre-Evaluation Results

1.1 Experience, motivation and interests regarding the course

Interest in findings of current research

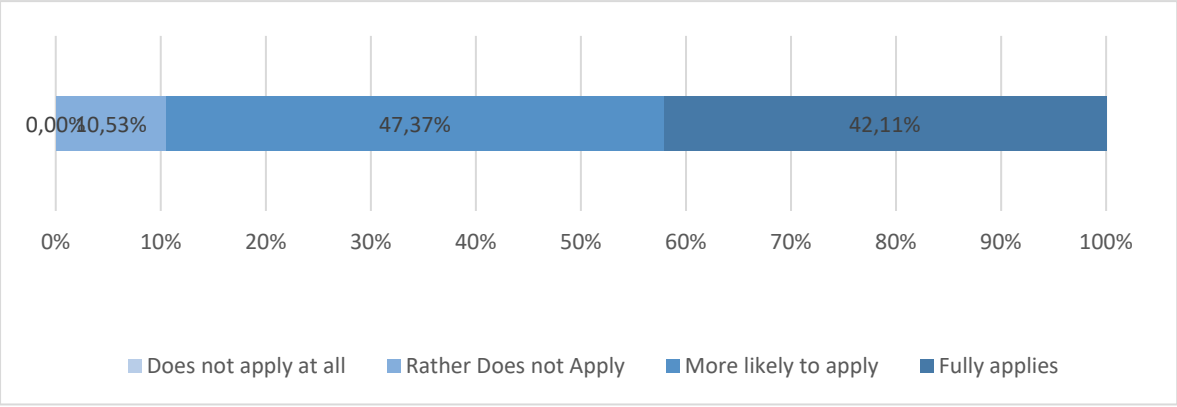


Figure 1: Interest in findings of current reseach [n=19]

Interest in learning new knowledge and/or new methods

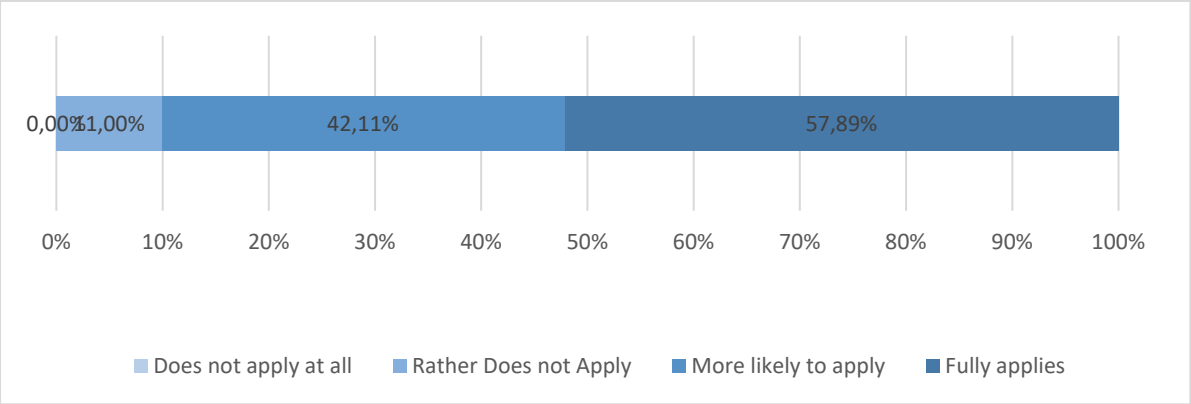


Figure 2: Interest in learning new knowledge and/or new methods [n=19]

Personal development

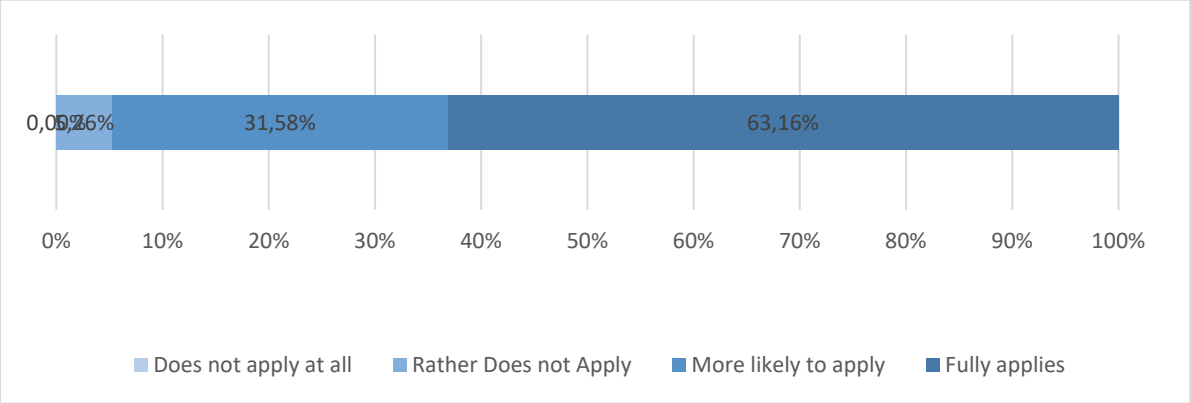


Figure 3: Personal development [n=19]

Desire for (international) exchange with other students

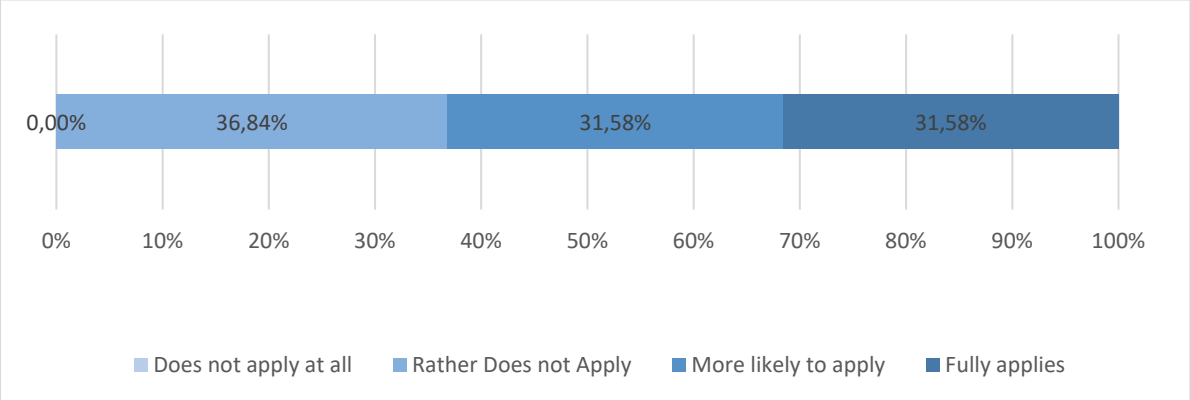


Figure 4: Desire for (international) exchange with other students [n=19]

Learn more about the topic of data analytics

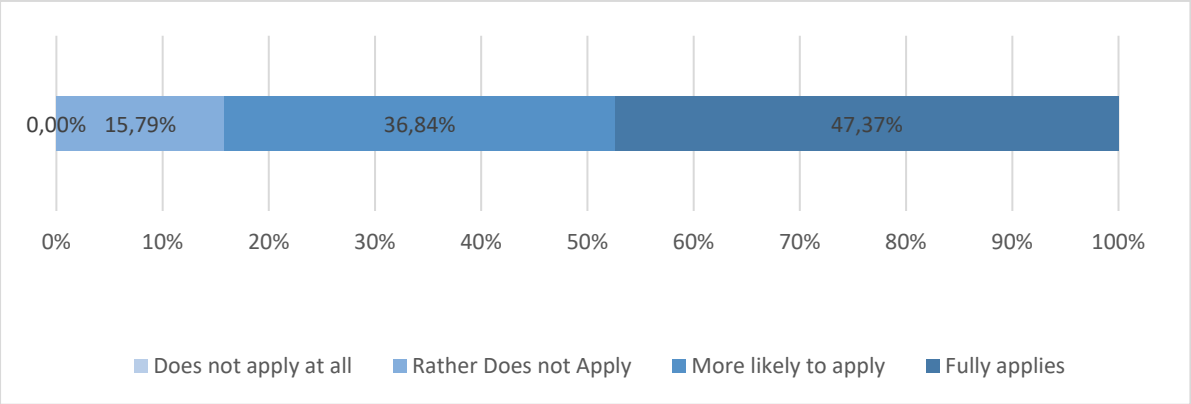


Figure 5: Learn more about the topic of Health Information systems Interoperability [n=19]

1.2 Course expectations

I expect from the course, …

… to gain new theoretical knowledge.

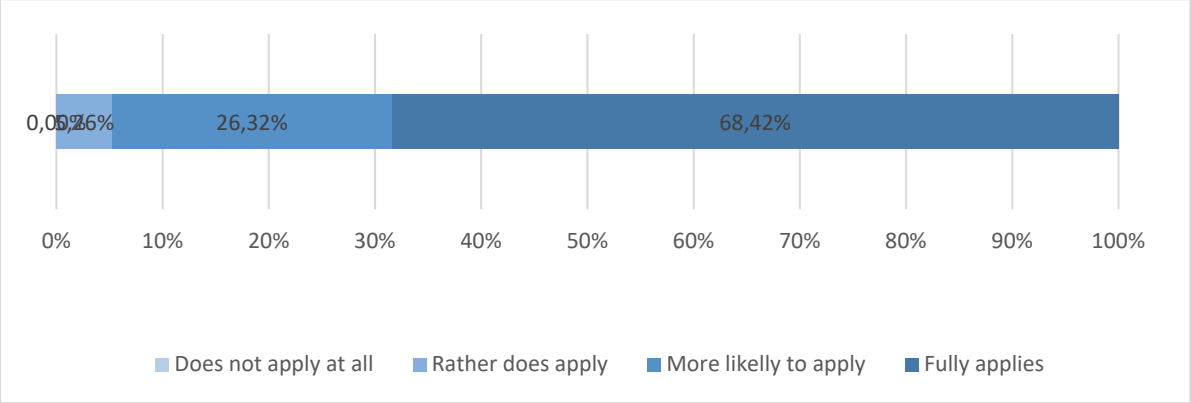


Figure 6: ... to gain new theoretical knowledge [n=19]

… to make new (and helpful) contacts.

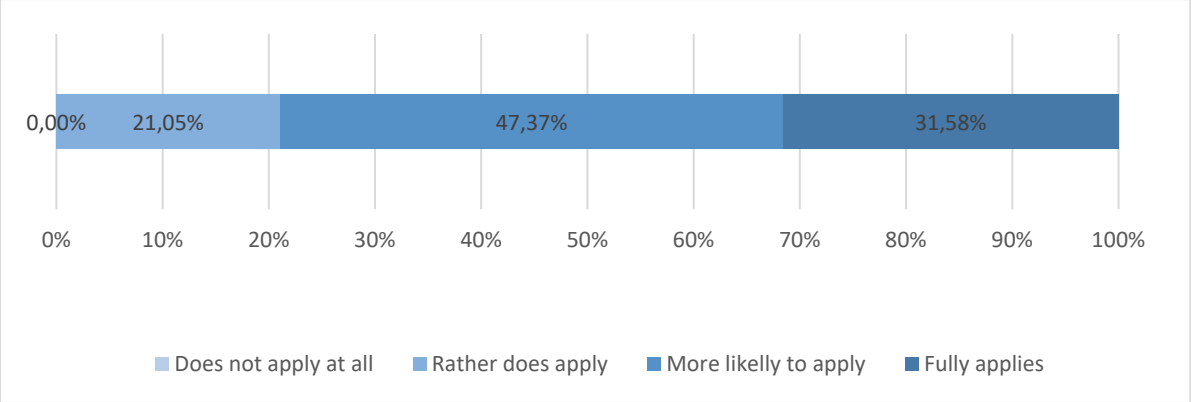


Figure 7: … to make new (and helpful) contacts [n=19]

… to get new knowledge for my studies.

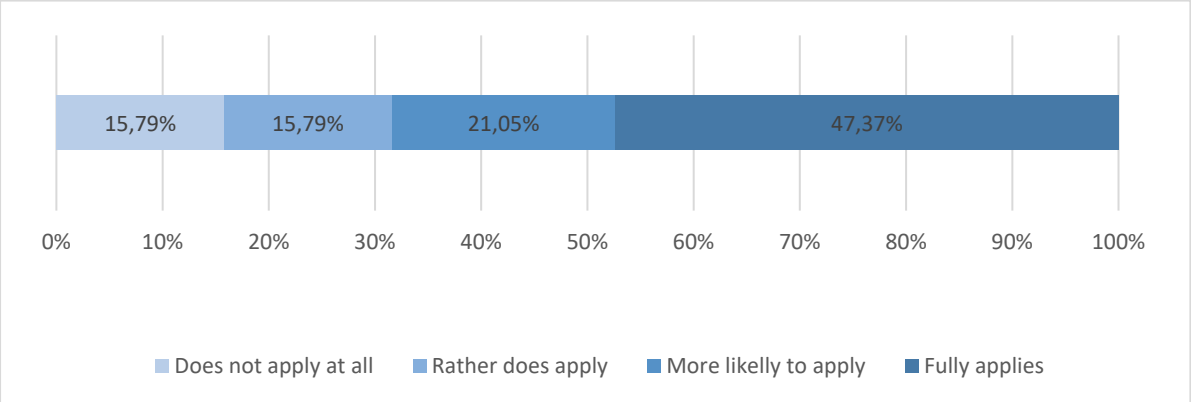


Figure 8: … to get new knowledge for my studies [n=19]

… to receive individual support.

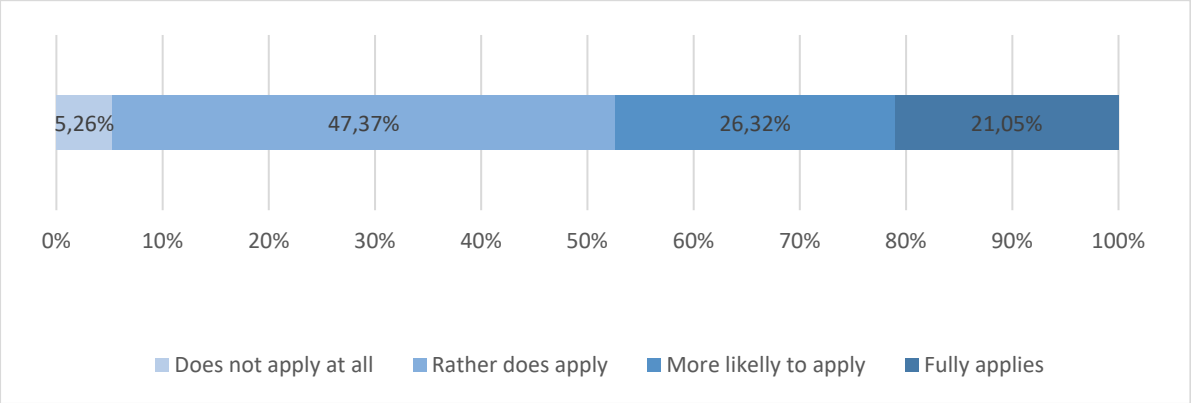


Figure 9: … to receive individual support [n=19]

… to get helpful impulses for my studies.

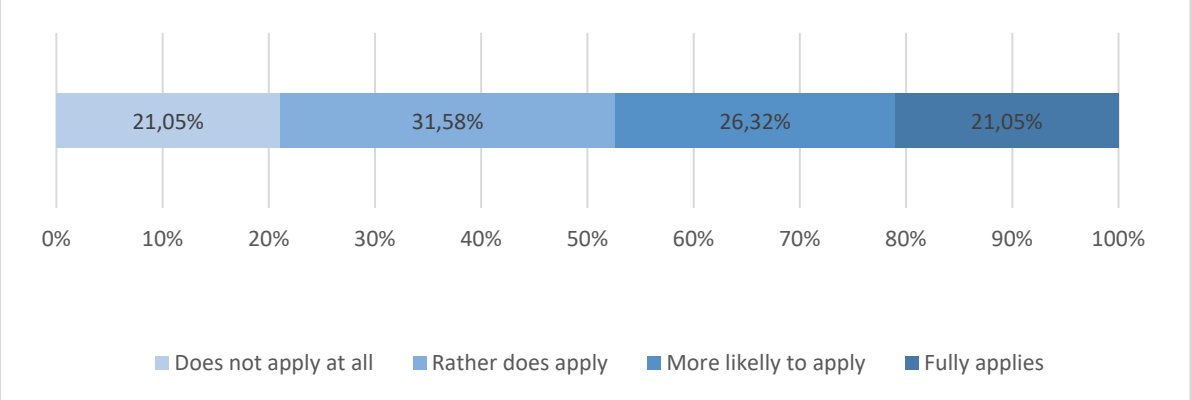


Figure 10: … to get helpful impulses for my studies [n=17]

… to be able to appropriately apply instruments and methods for addressing Health Information systems Interoperability Issues.

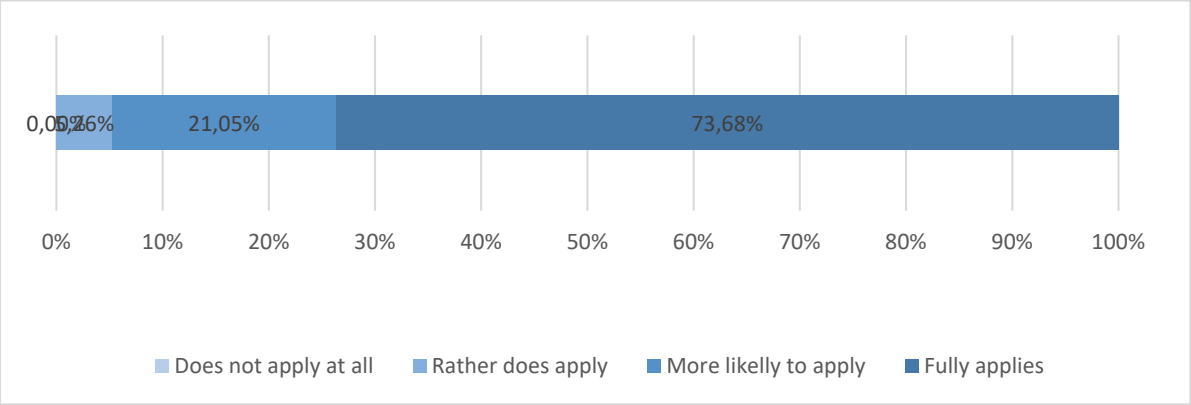


Figure 11: … to be able to appropriately apply instruments and methods for addressing Health Information systems Interoperability Issues [n=19]

1.3 Prior knowledge of the content of the course: Learning Healthcare in Action: Interoperability

I am able to characterise the mais obstacles to information exchange between Health Organisations and their Health Information Systems

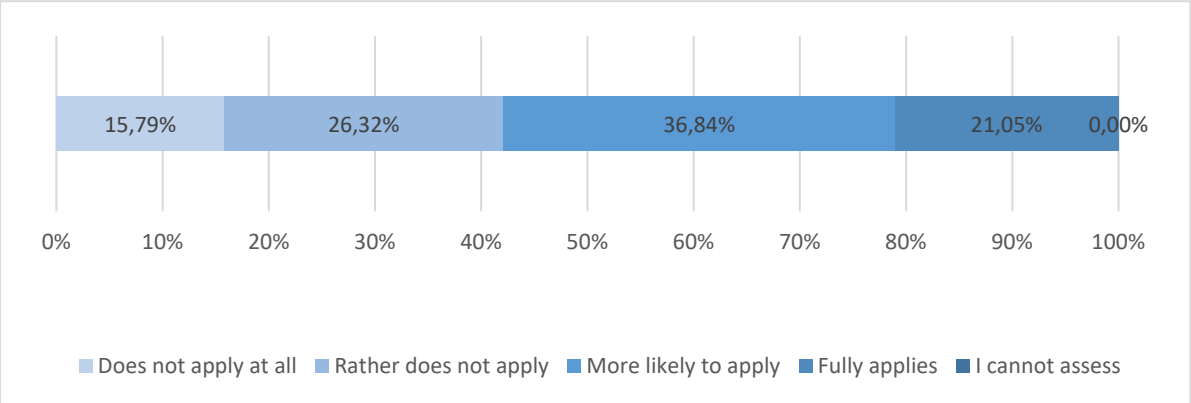


Figure 12: I am able to characterize the main obstacles to information exchange between Health Organisations and their Health Information Systems [n=19]

I can identify the main consequences to patients and health organisations originating from the lack of interoperability

.

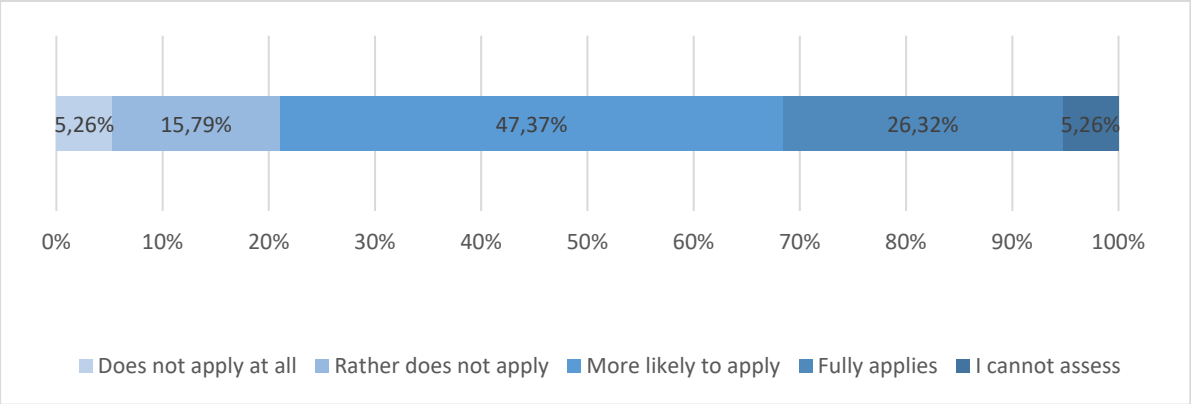


Figure 13: I can identify the main consequences to patients and health organisations originating from the lack of interoperability [n=19]

I am able to define the concept of interoperability in Healthcare.

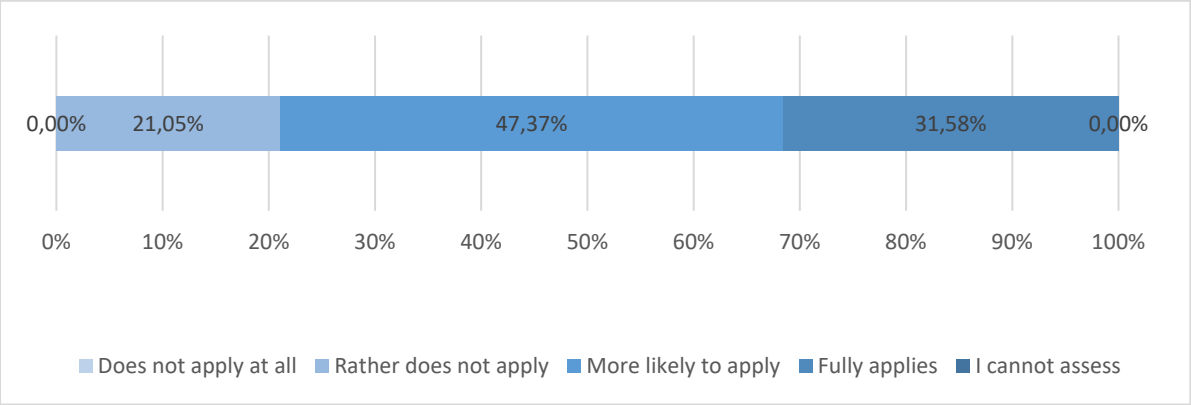


Figure 14: I am able to define the concept of interoperability in Healthcare [n=19]

I can identify the different levels of interoperability.

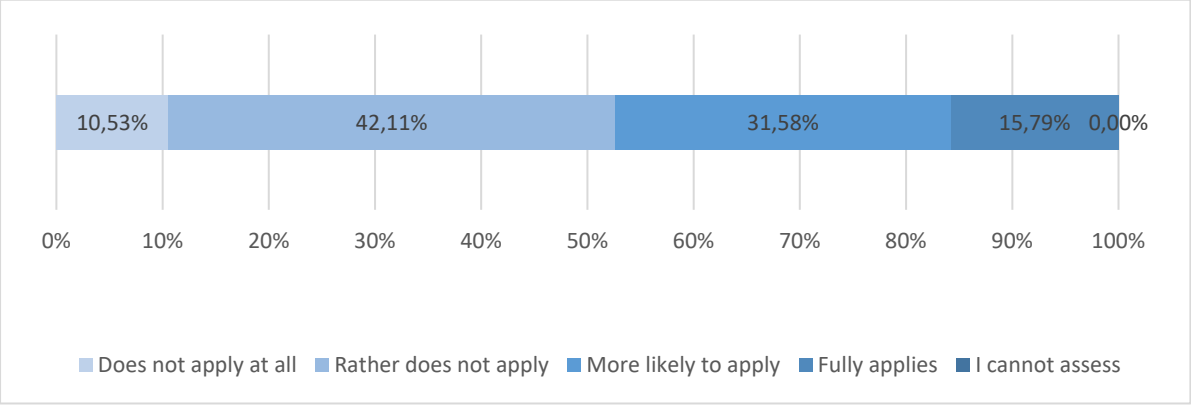


Figure 15: I can identify the different levels of interoperability [n=19]

I am able to identify the main standards used in health interoperability.

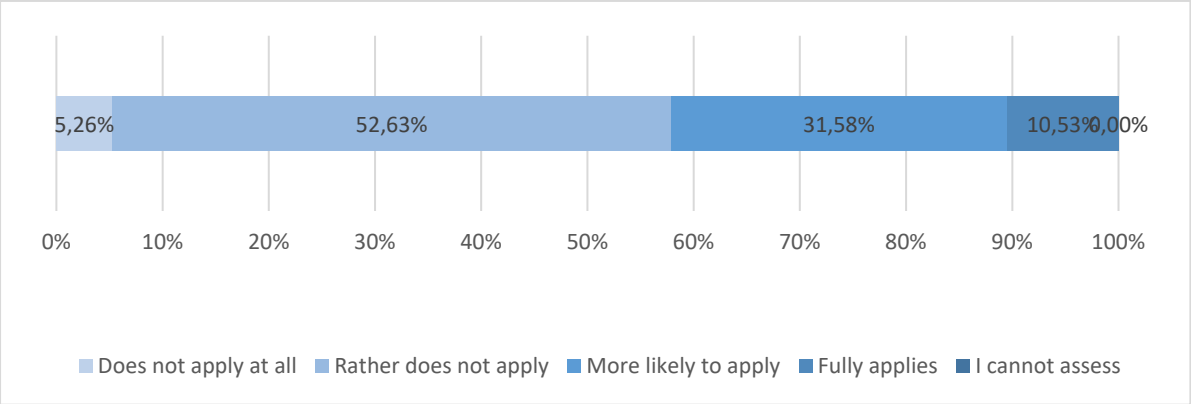


Figure 16: I am able to identify the main standards used in health interoperability [n=19]

I am able to summarize the main differences among the different standards.

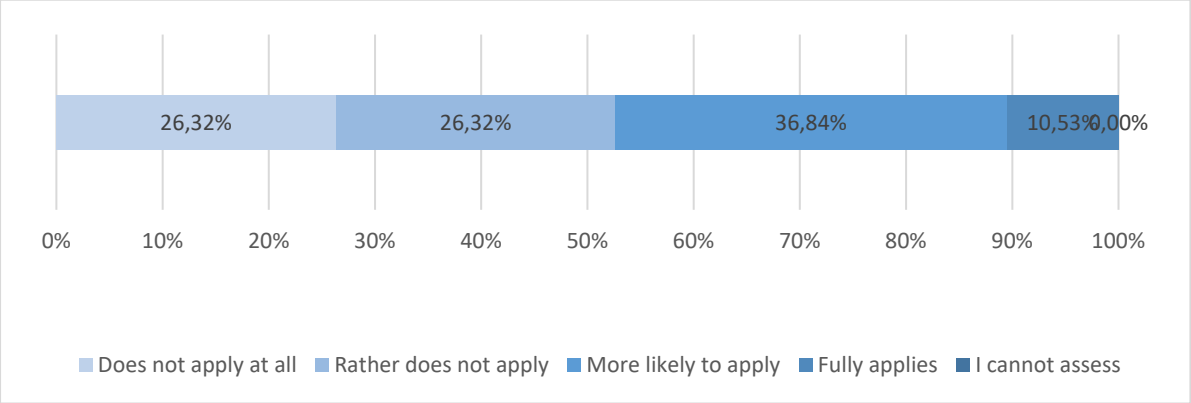


Figure 17: I am able to summarize the main differences among the different standards [n=19]

I know what HL7 means

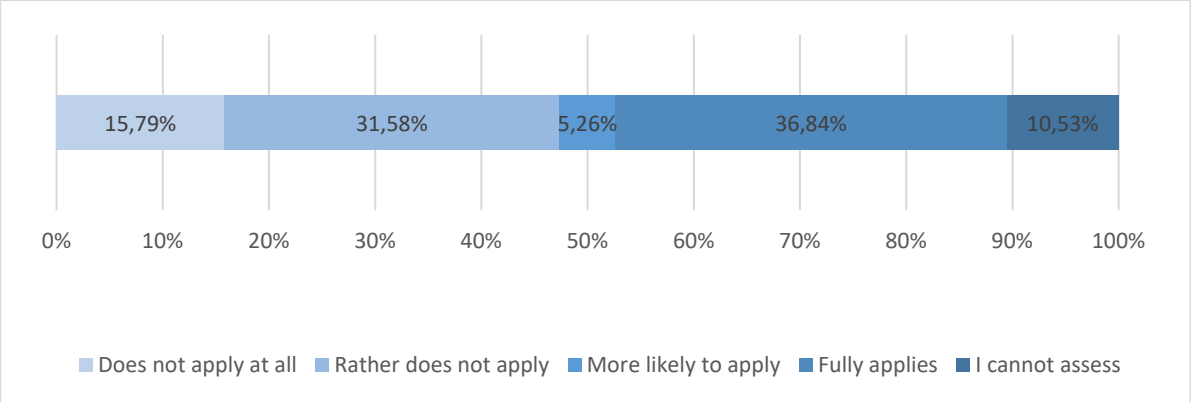


Figure 18: I know what HL7 means [n=19]

I can describe the main concepts of HL7 v2 and how it works.

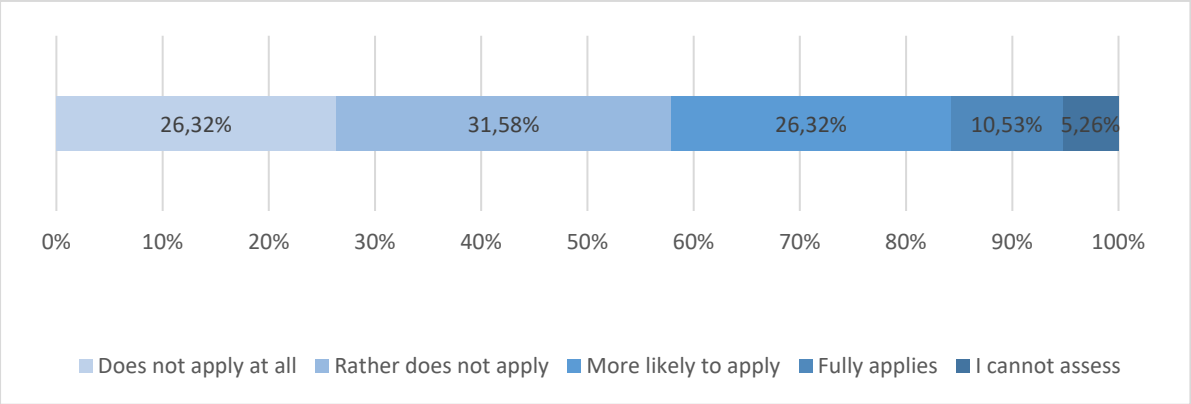


Figure 19: I can describe the main concepts of HL7 v2 and how it works [n=19]

I know what FHIR means.

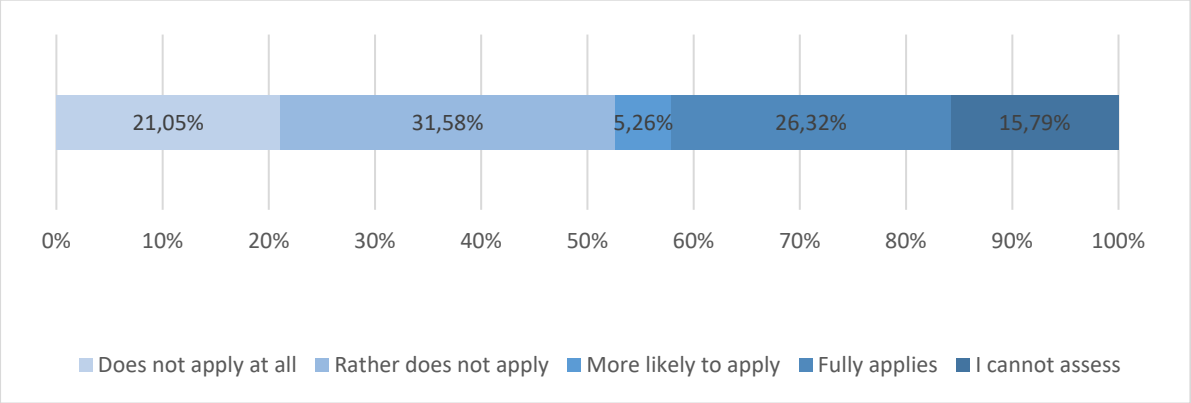


Figure 20: I know what FHIR means [n=16]

I can describe the main concepts of FHIR and how it works.

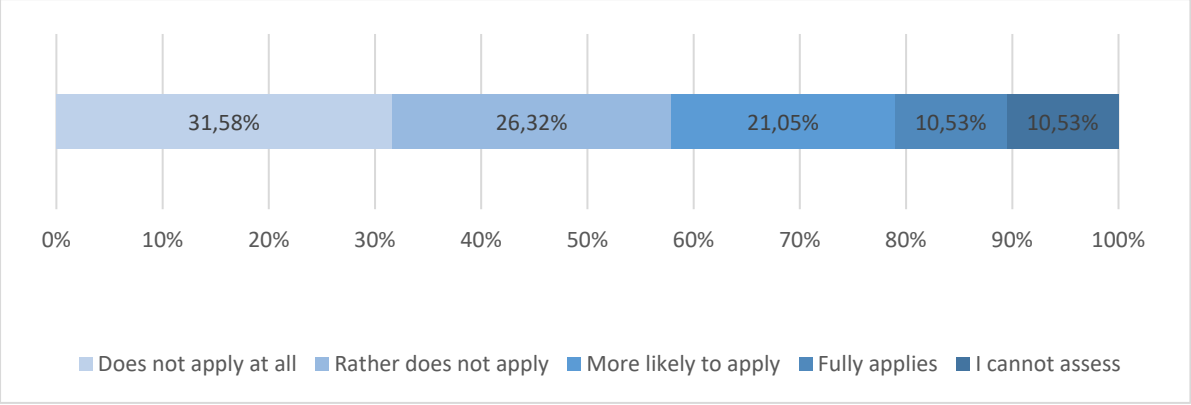


Figure 21: I can describe the main concepts of FHIR and how it works [n=19]

I know what openEHR means.

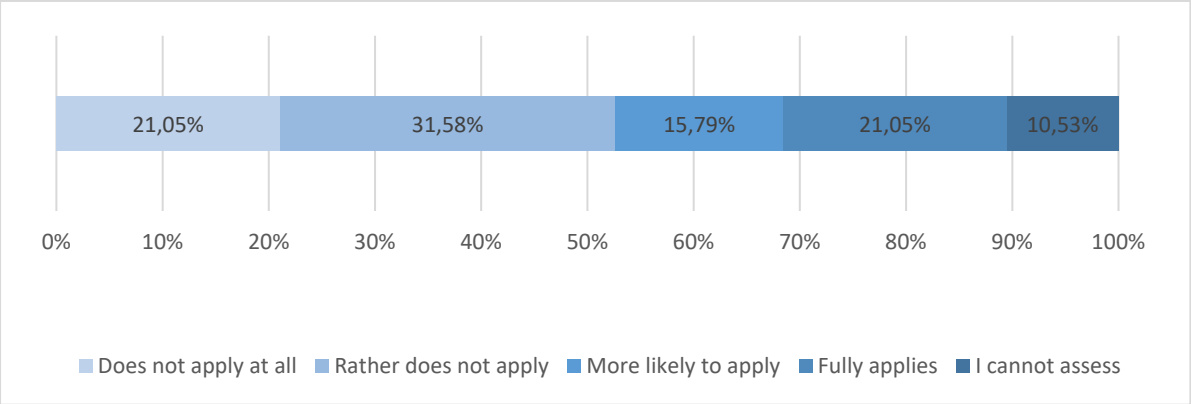


Figure 22: I know what openEHR means [n=19]

I can describe the main concepts of openEHR and how it works.

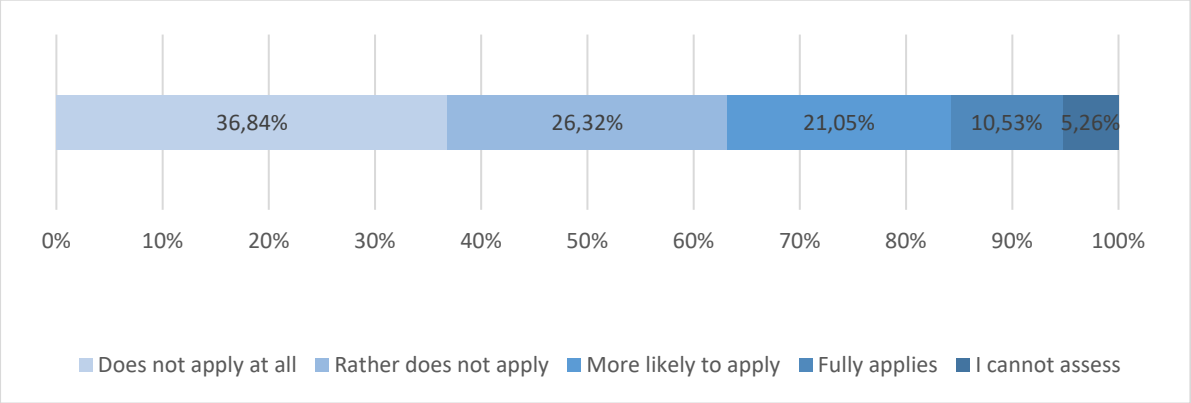


Figure 23: I can describe the main concepts of openEHR and how it works [n=19]

I know what SNOMED means.

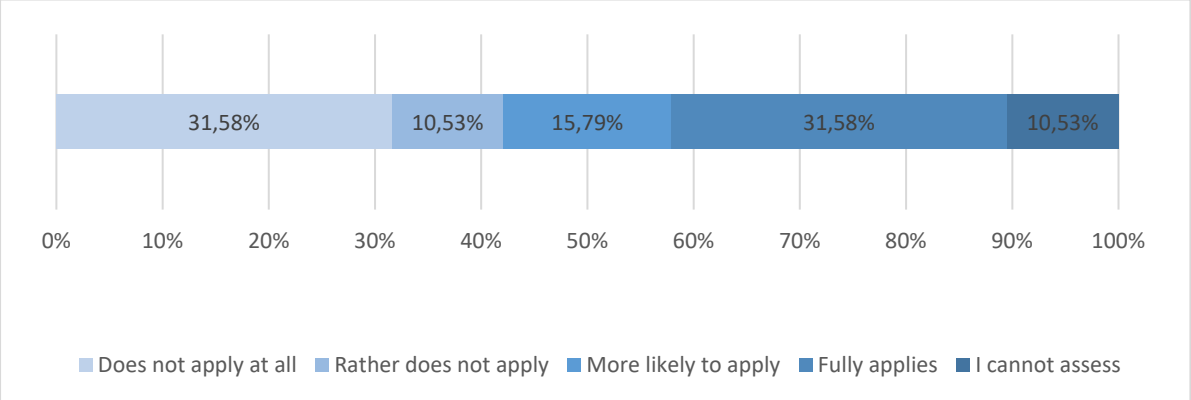


Figure 24: I know what SNOMED means [n=16]

I can understand code systems an how they work.

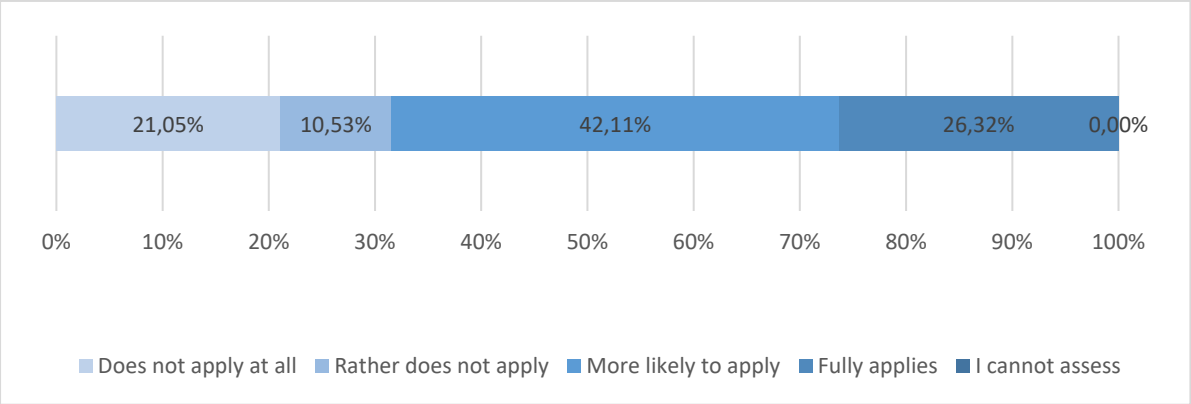


Figure 25: I can understand code systems an how they work [n=16]

I can associate the different standards to different levels of interoperability.

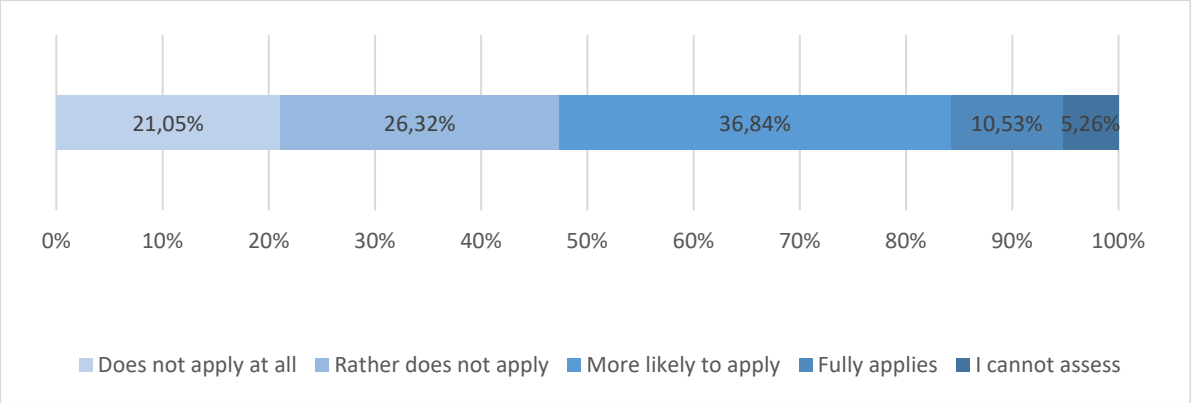


Figure 26: I can associate the different standards to different levels of interoperability [n=16]

1.4 Personal information

Age

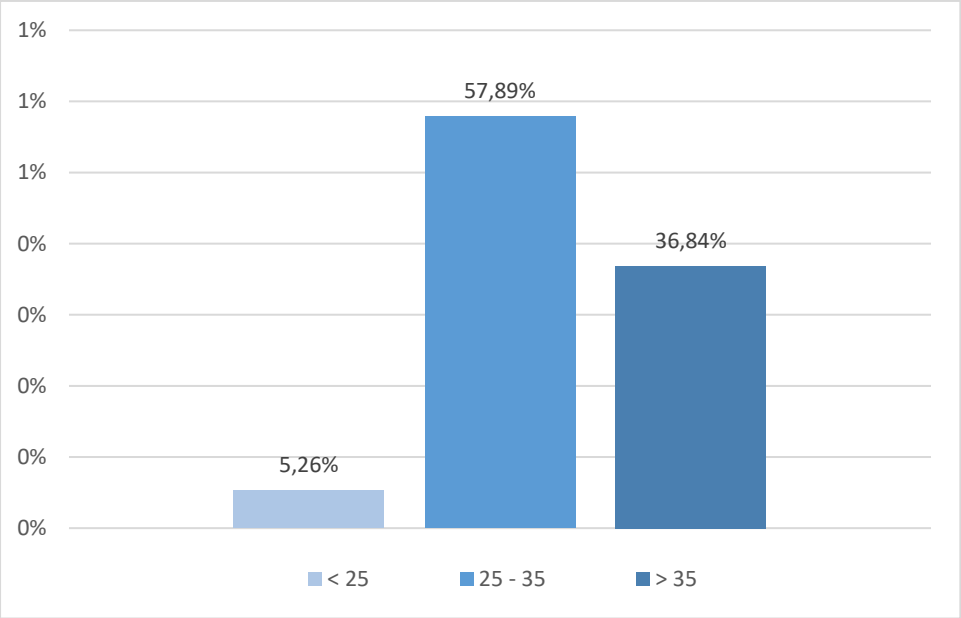


Figure 27: Age [n=19]

Gender

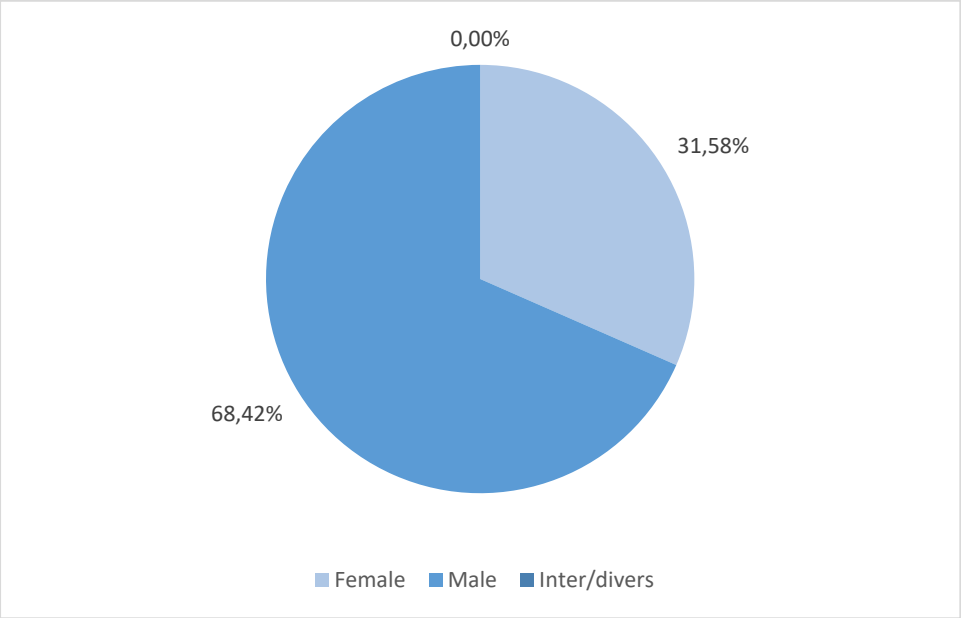


Figure 28: Gender [n=19]

University

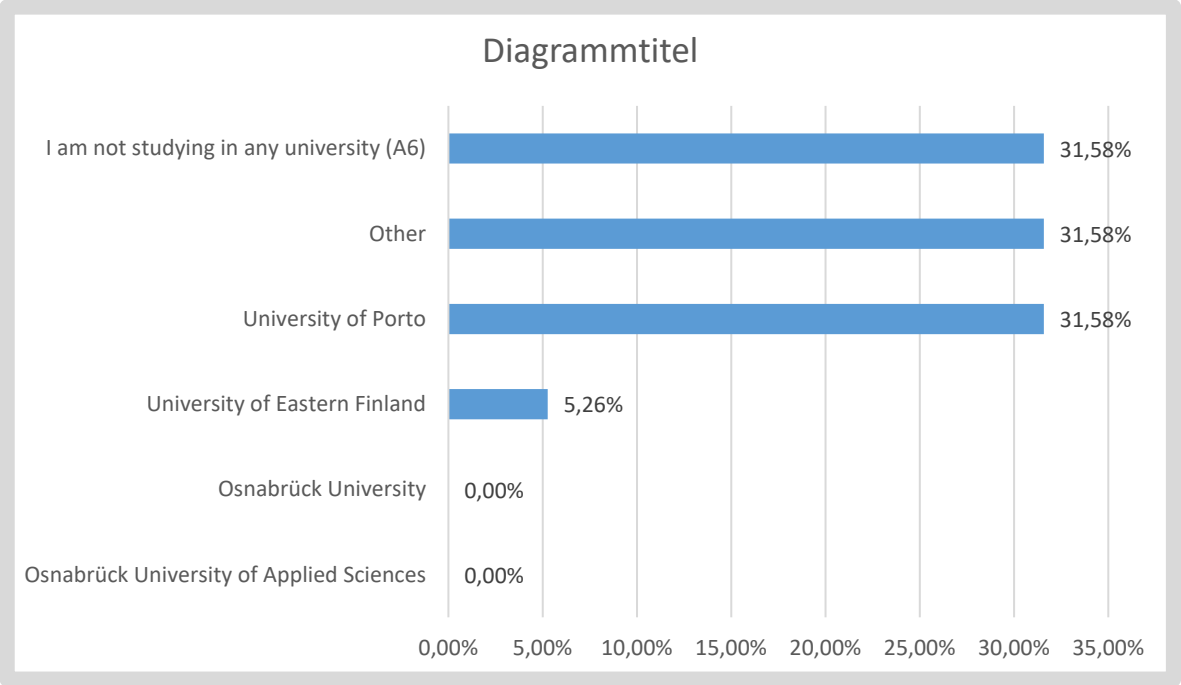


Figure 29: University [n=19]

Study degree

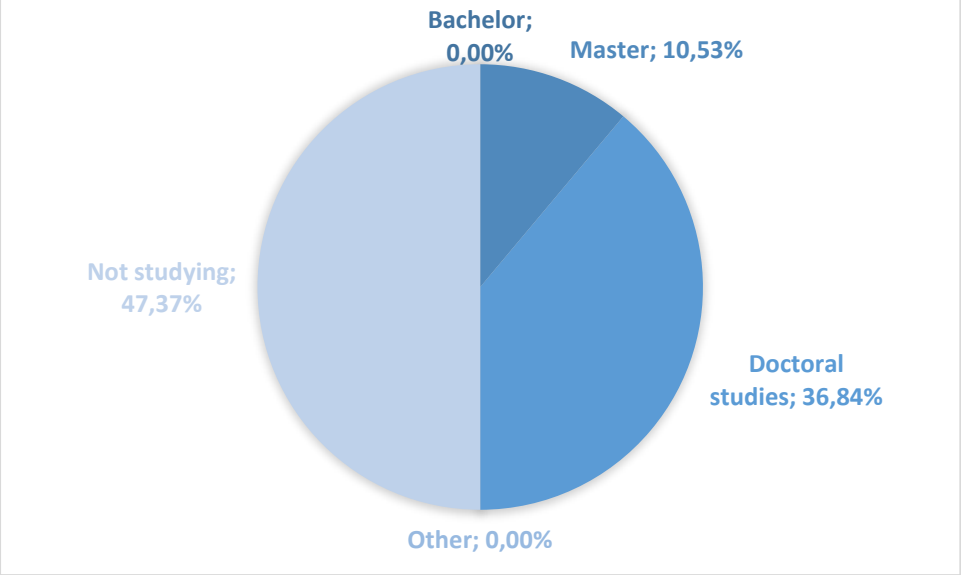


Figure 30: Study degree [n=19]

Field of study

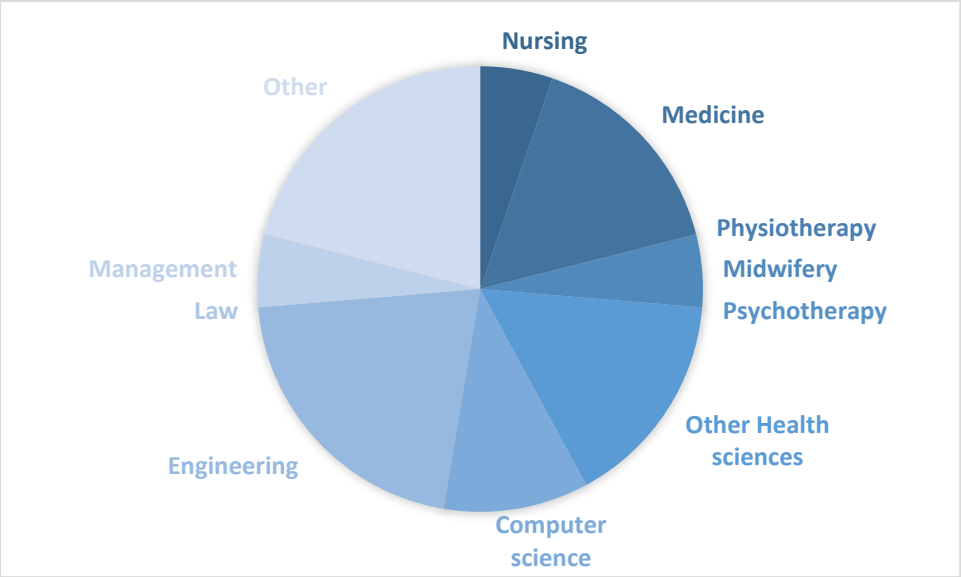
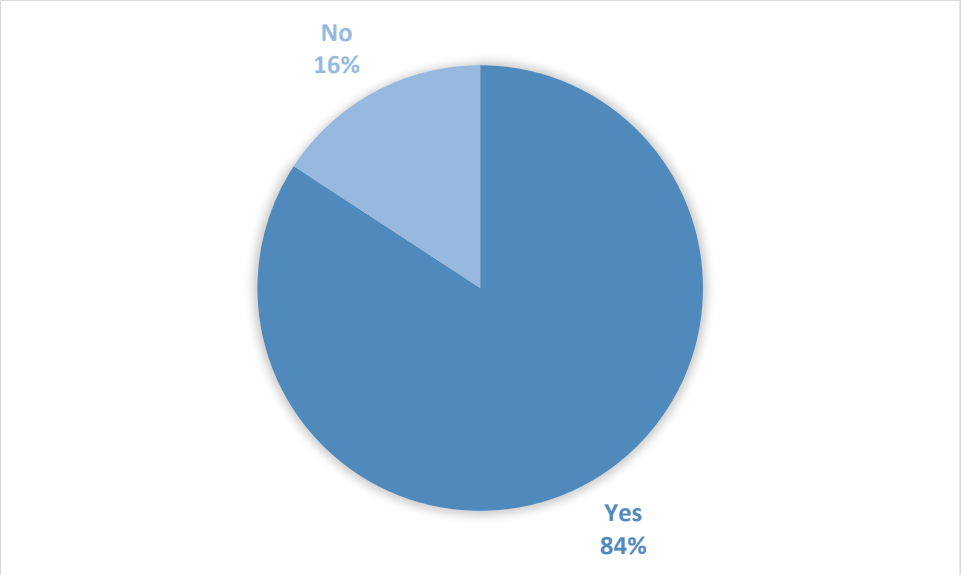


Figure 31: Field of study [n=19]

Have you had participated previously in distance learning courses (besides any forced by the restriction of pandemics)?



2 Post-Evaluation Results

2.1 Course participation

The instructors responded well to the different needs of the participants.

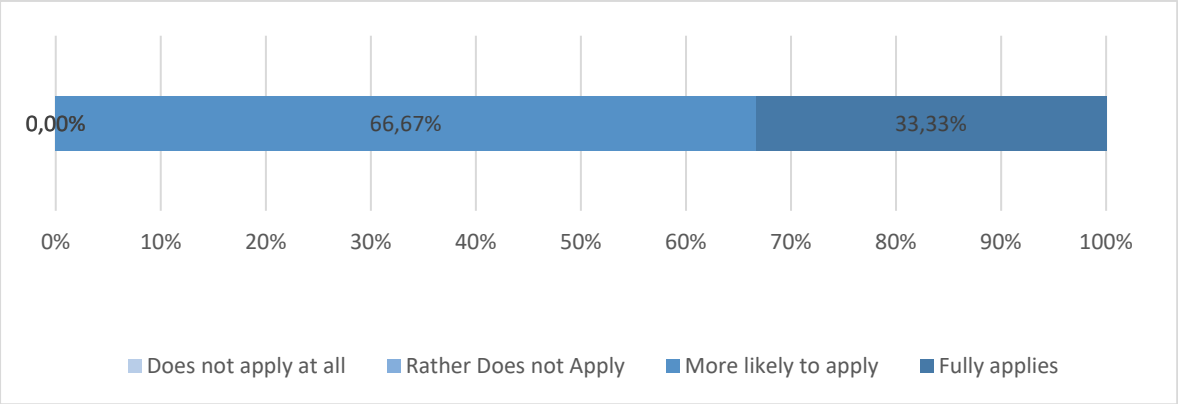


Figure 32: The instructors responded well to the different needs of the participants [n=3]

The instructors ensured that participants remained active and engaged in a productive dialogue.

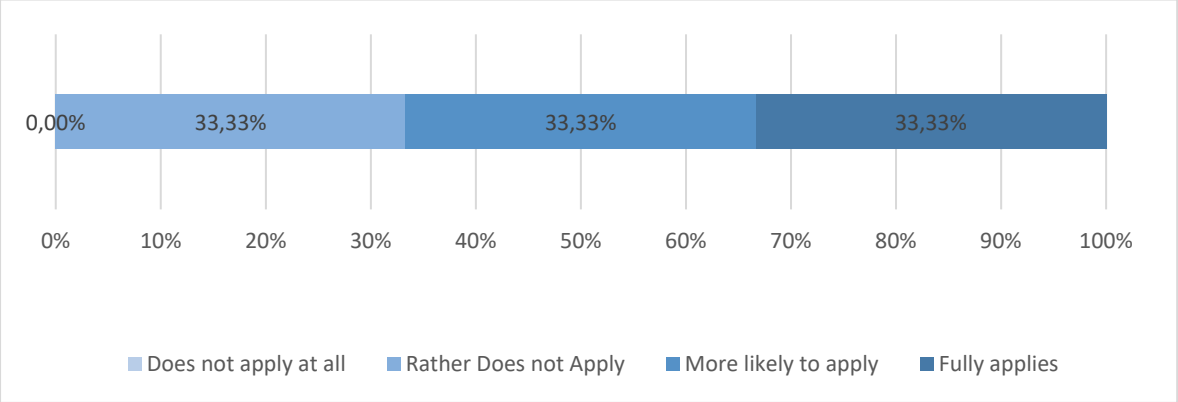


Figure 33: The instructors ensured that participants remained active and engaged in a productive dialogue [n=3]

The level of difficulty of the course was appropriate.

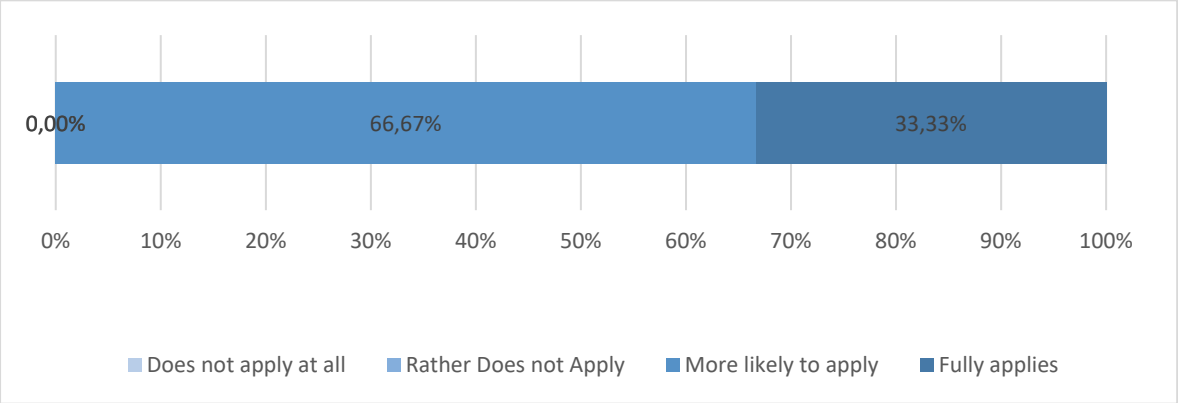


Figure 34: The level of difficulty of the course was appropriate [n=3]

The amount of content was appropriate.

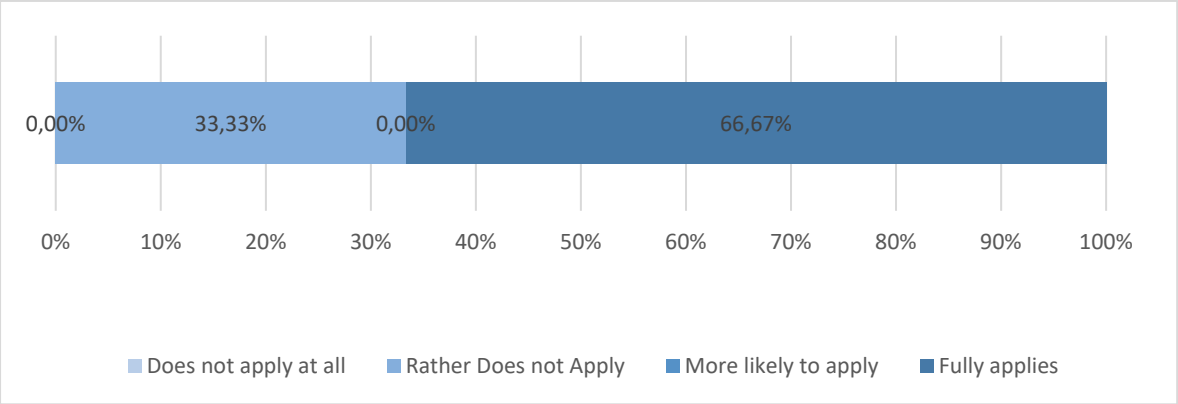


Figure 35: The amount of content was appropriate [n=3]

The learning objectives of the course were clear.

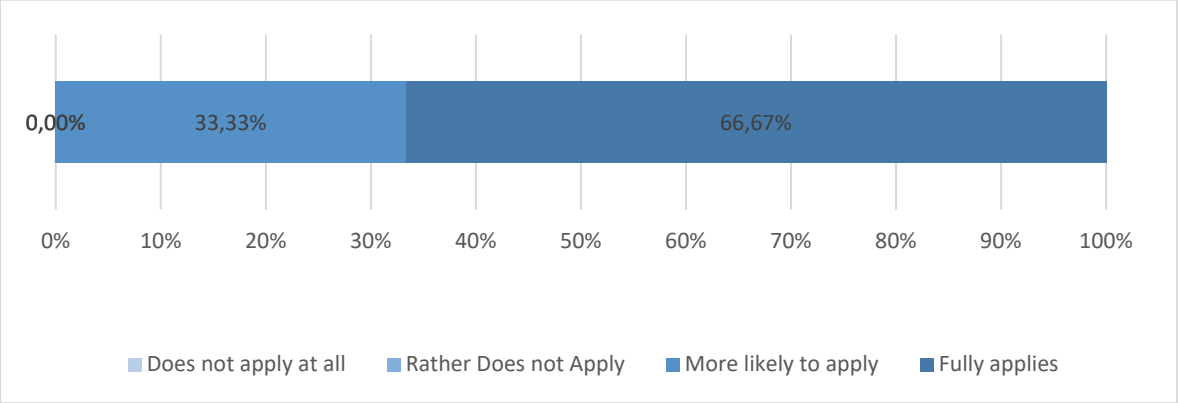


Figure 36: The learning objectives of the course were clear [n=3]

Learning objectives set for the course were realistic.

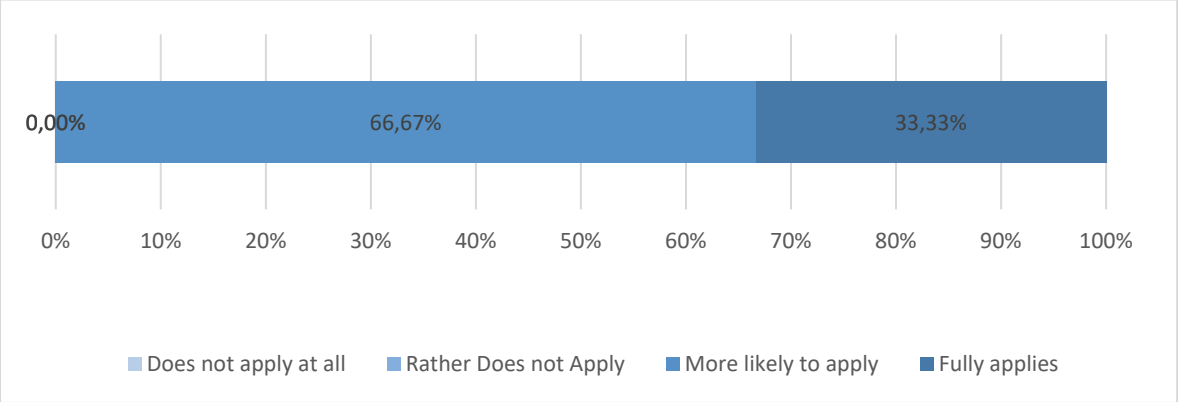


Figure 37: Learning objectives set for the course were realistic [n=3]

I set my own learning objectives for this course.

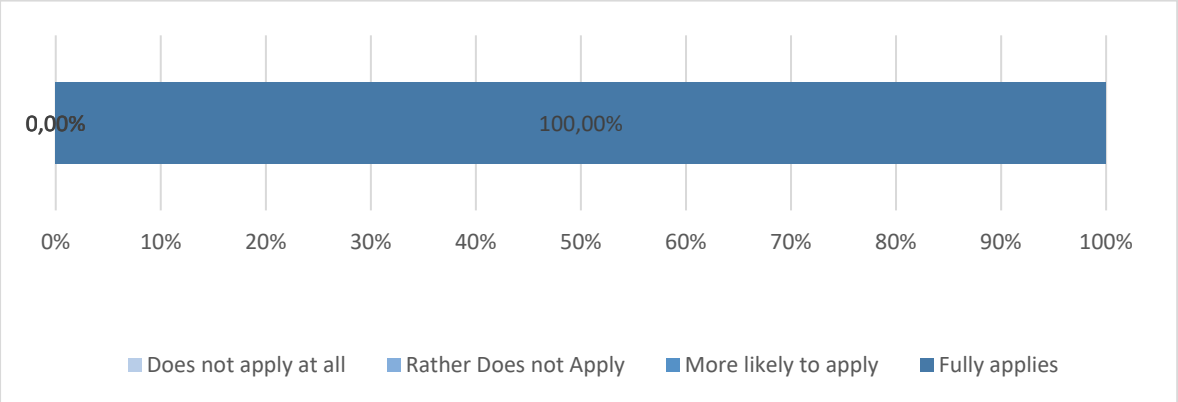


Figure 38: I set my own learning objectives for this course [n=3]

I reflected my own learning objectives to the course learning objectives.

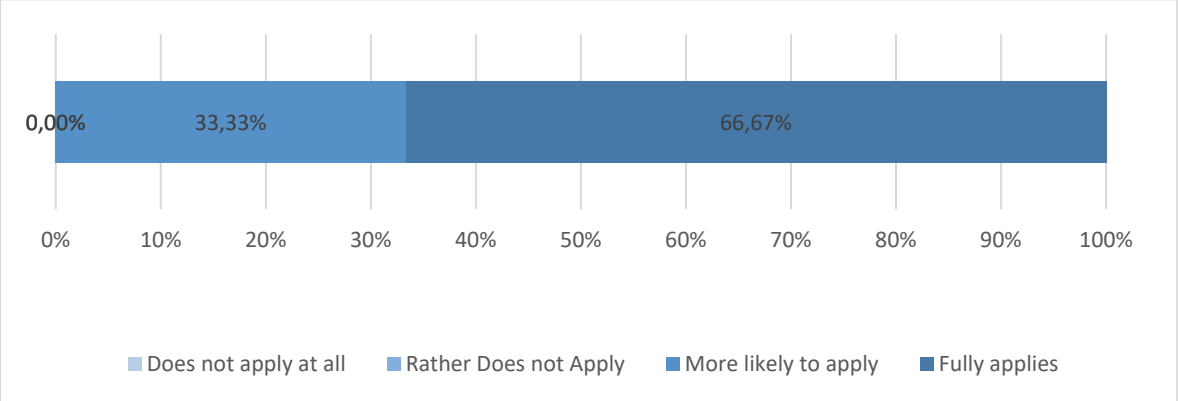


Figure 39: I reflected my own learning objectives to the course learning objectives [n=3]

I had the opportunity to reflect on what I have learned.

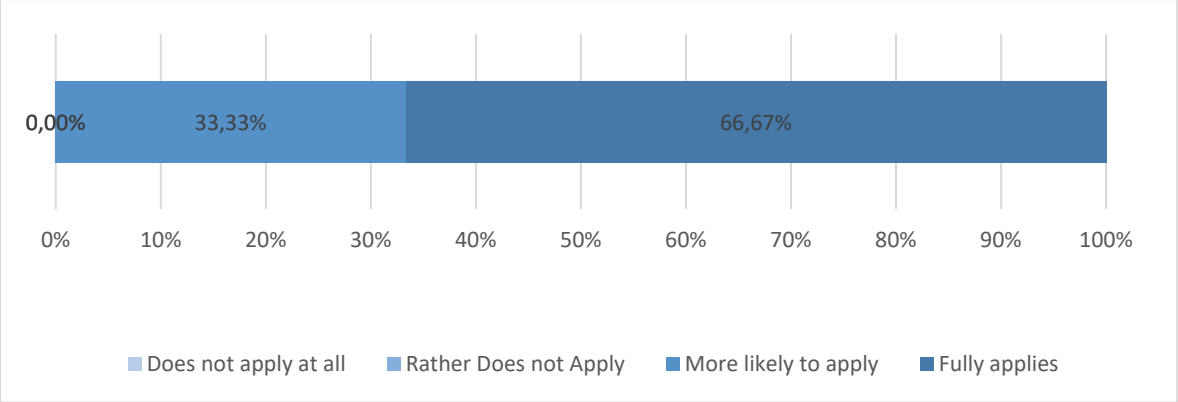


Figure 40: I had the opportunity to reflect on what I have learned [n=3]

2.2 Evaluation of the personal benefit and practical relevance

Contents and learning material

Attending the course was worthwhile for me personally.

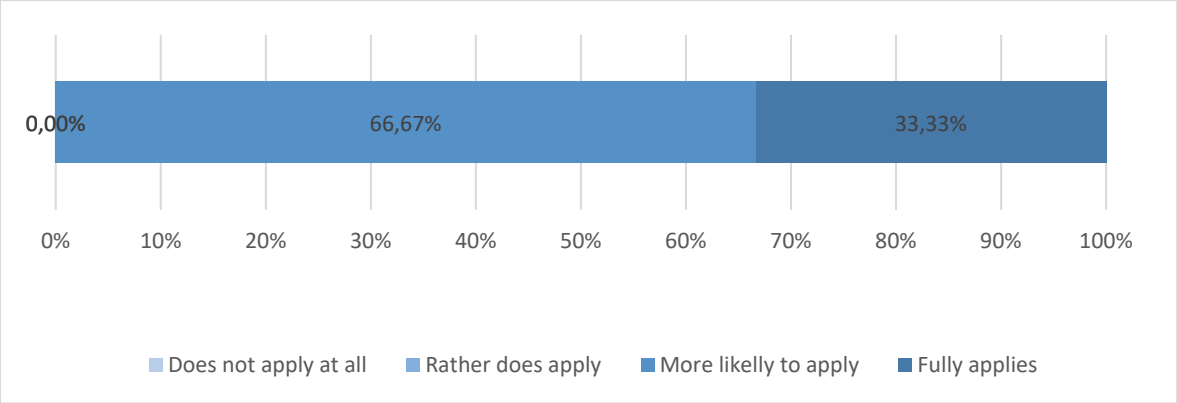


Figure 41: Attending the course was worthwhile for me personally [n=3]

I was aware of central course contents.

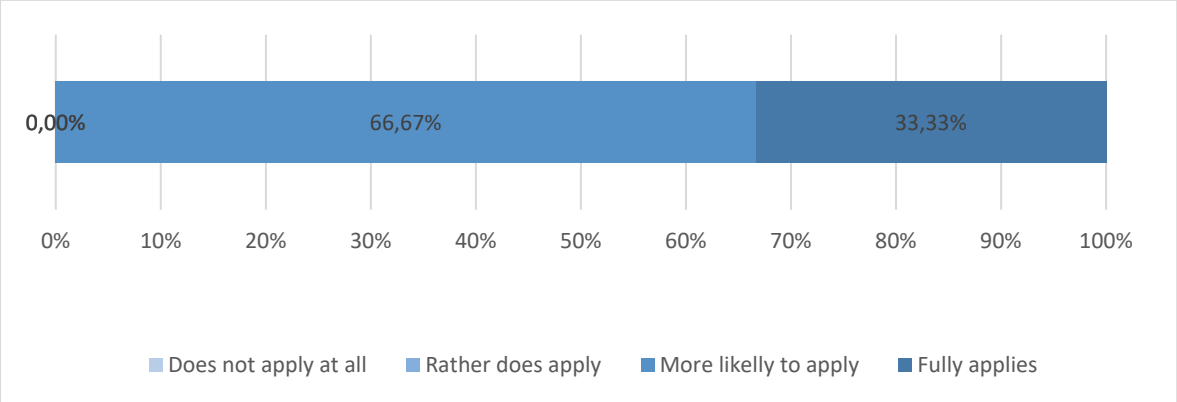


Figure 42: I was aware of central course contents [n=3]

My understanding of the course topic has evolved through participation.

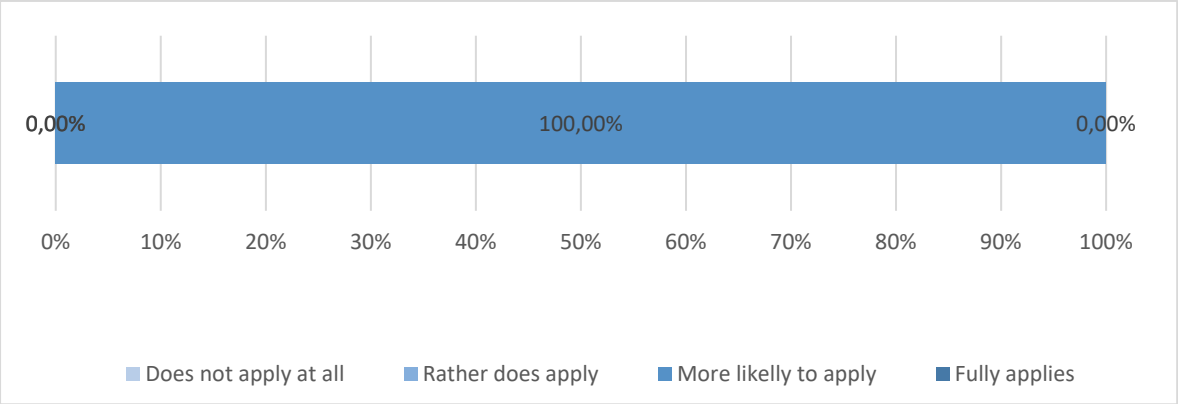


Figure 43: My understanding of the course topic has evolved through participation [n=3]

The relation between theory and practice was shown.

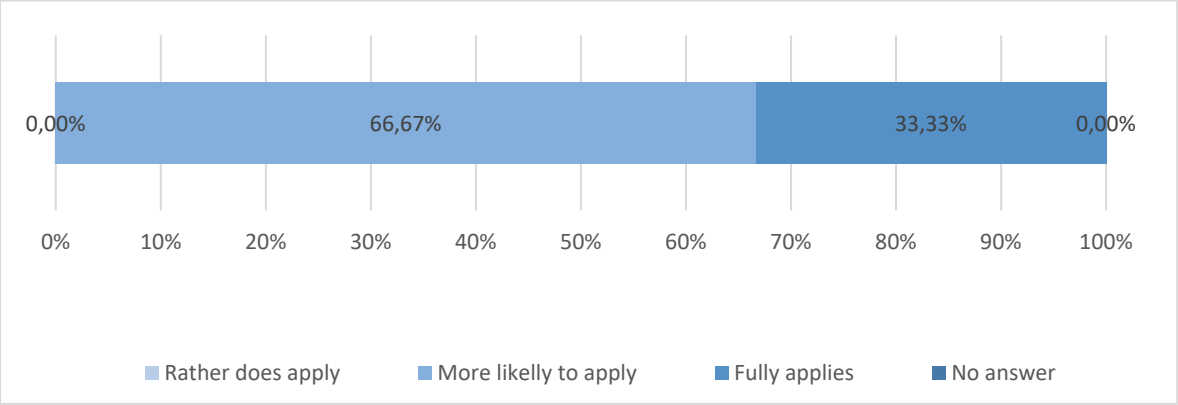


Figure 44: The relation between theory and practice was shown [n=3]

The course content and learning materials supported me in deep learning.

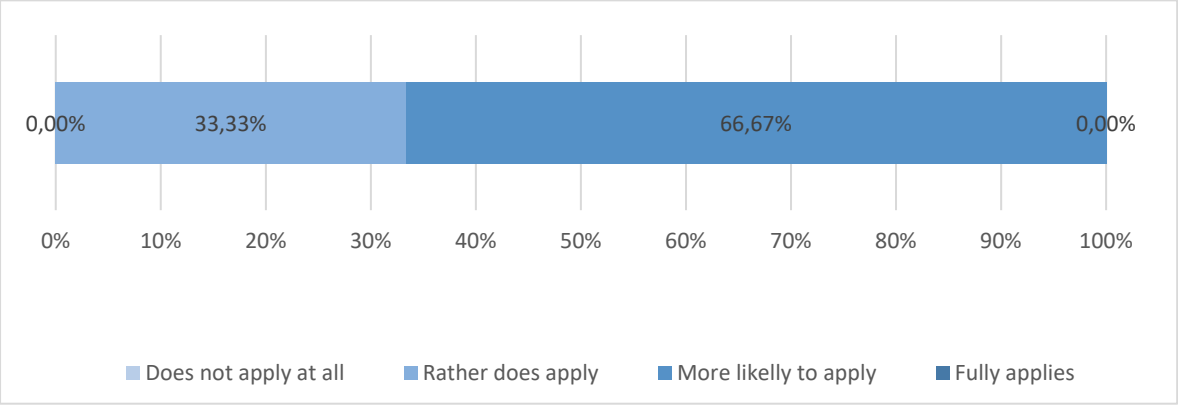


Figure 45: The course content and learning materials supported me in deep learning [n=3]

The contents of the course were appropriate compared to my previous knowledge.

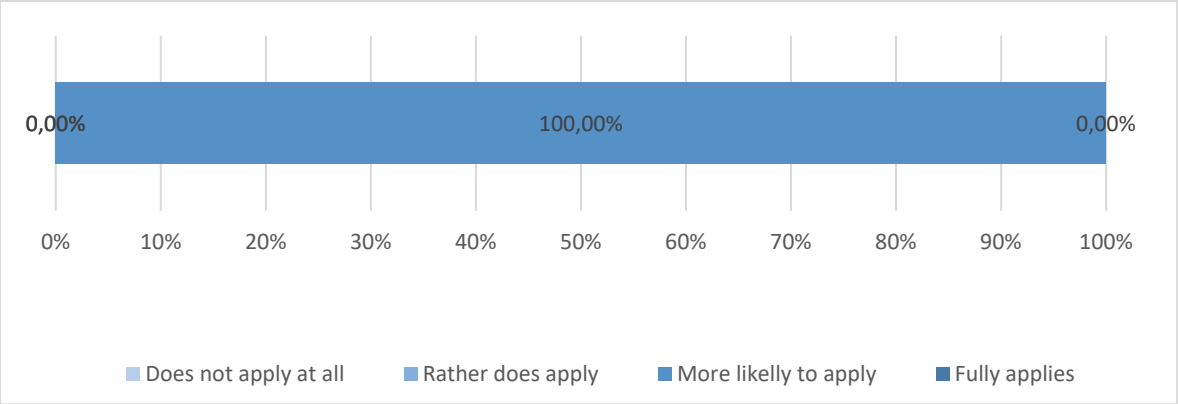


Figure 46: The contents of the course were appropriate compared to my previous knowledge [n=3]

The level of the course was appropriate to my previous knowledge.

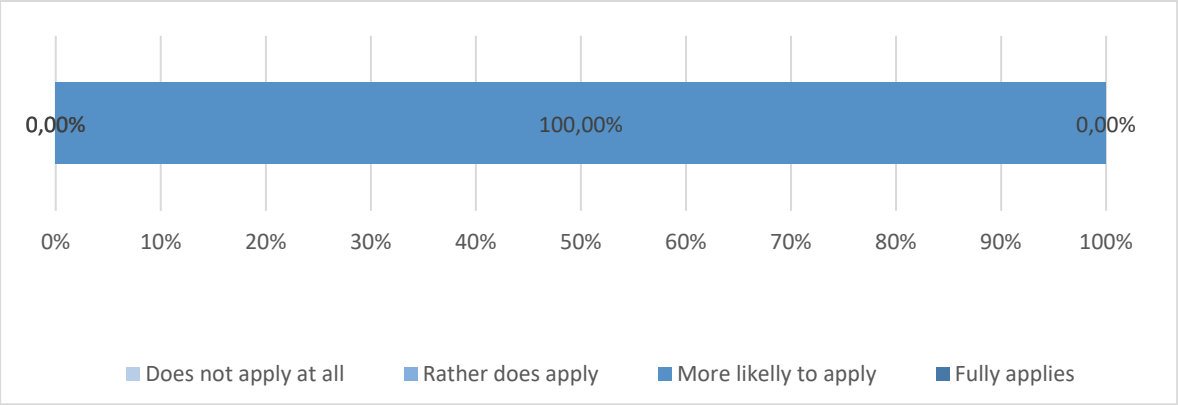


Figure 47: The level of the course was appropriate to my previous knowledge [n=3]

I was able to take advantage of what I have learned earlier about this topic.

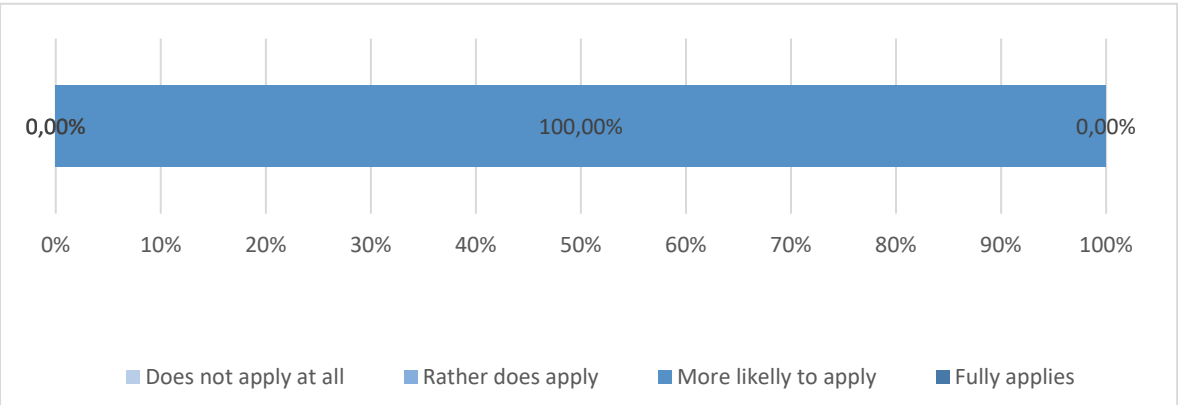


Figure 48: I was able to take advantage of what I have learned earlier about this topic [n=3]

I think I will still be able to report what I learned some time after the course was offered.

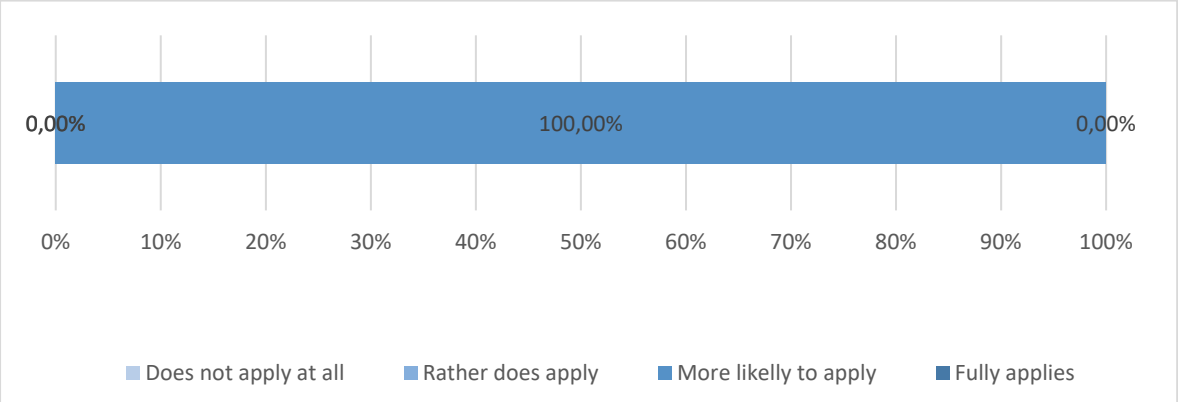


Figure 49: I think I will still be able to report what I learned some time after the course was offered [n=3]

Learning process and teaching methods

The teaching methods suited well to the learning objectives set for the course.

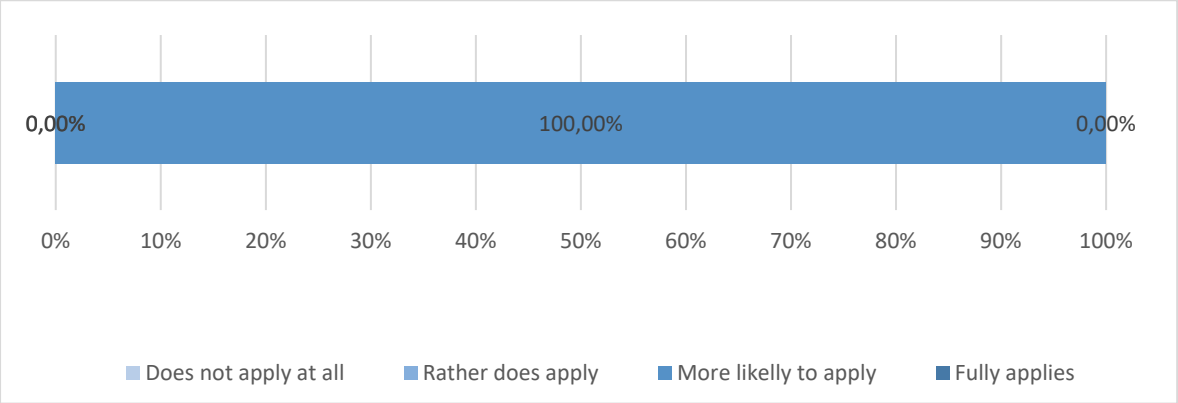


Figure 50: The teaching methods suited well to the learning objectives set for the course [n=3]

Course planning proved teacher´s expertise of the teaching methods and learning.

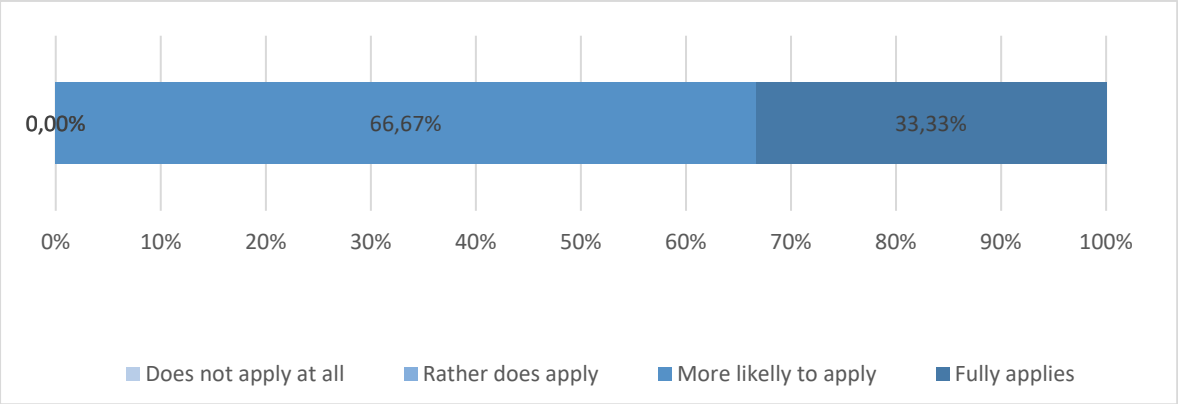


Figure 51: Course planning proved teacher´s expertise of the teaching methods and learning [n=3]

I took responsibility for my own learning, I was active and motivated.

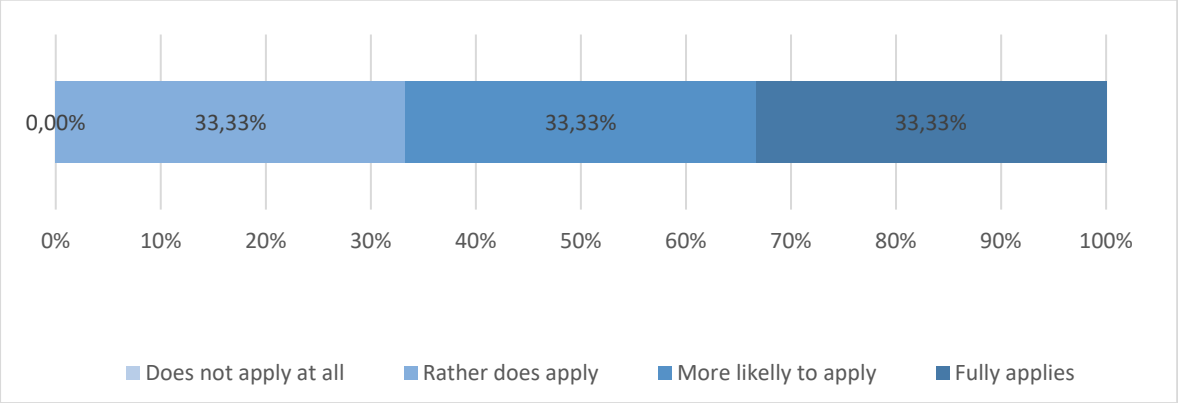


Figure 52: I took responsibility for my own learning, I was active and motivated [n=3]

I pointed out my motivation to understand and develop my own learning in the course.

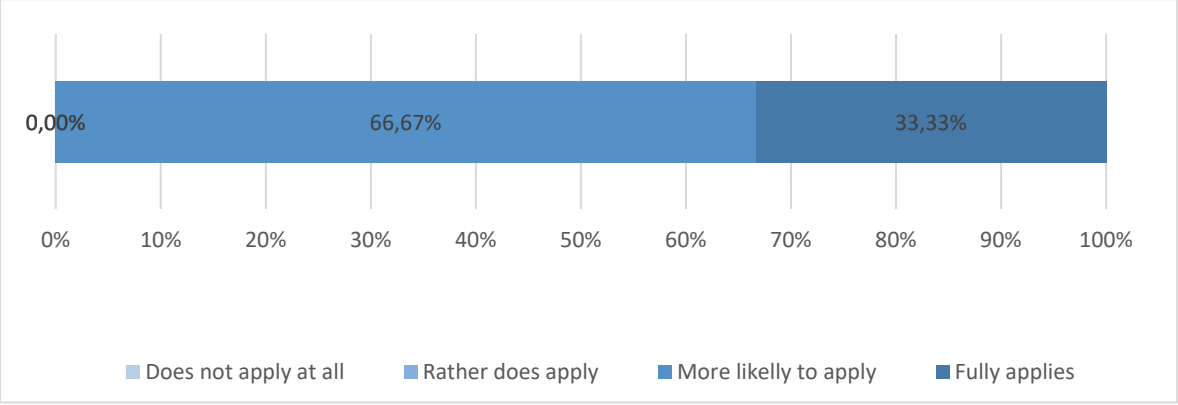


Figure 53: I pointed out my motivation to understand and develop my own learning in the course [n=3]

Self-learning phase

The scope of the self-learning phase was appropriate.

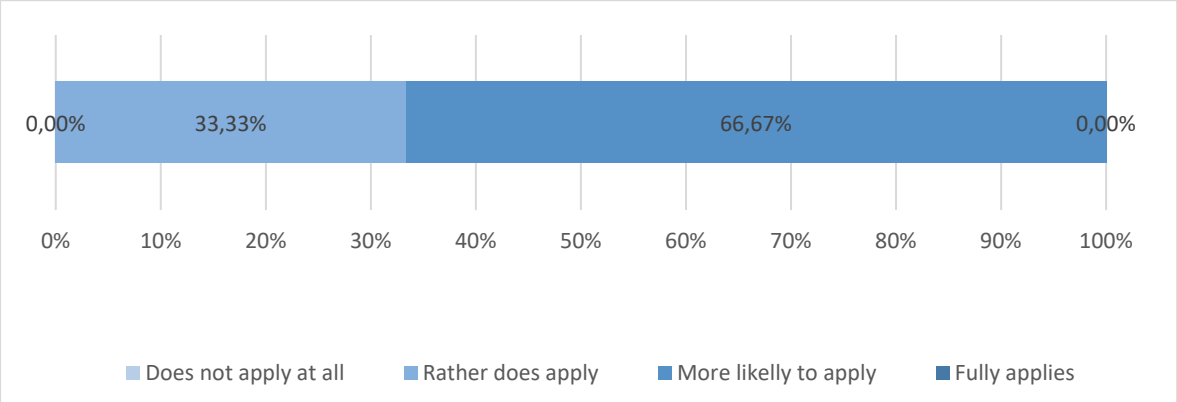


Figure 54: The scope of the self-learning phase was appropriate [n=3]

The tasks were understandable.

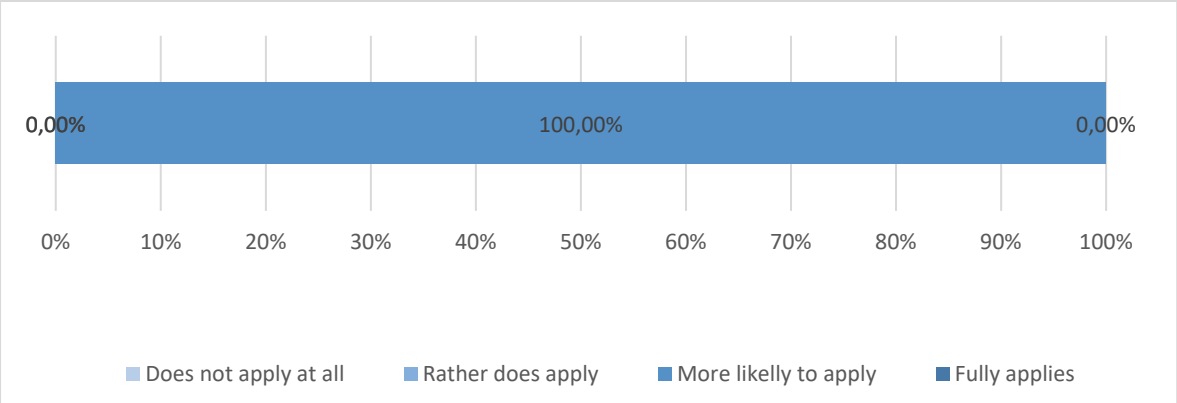


Figure 55: The tasks were understandable [n=3]

The time frame for completing the assignments was reasonable.

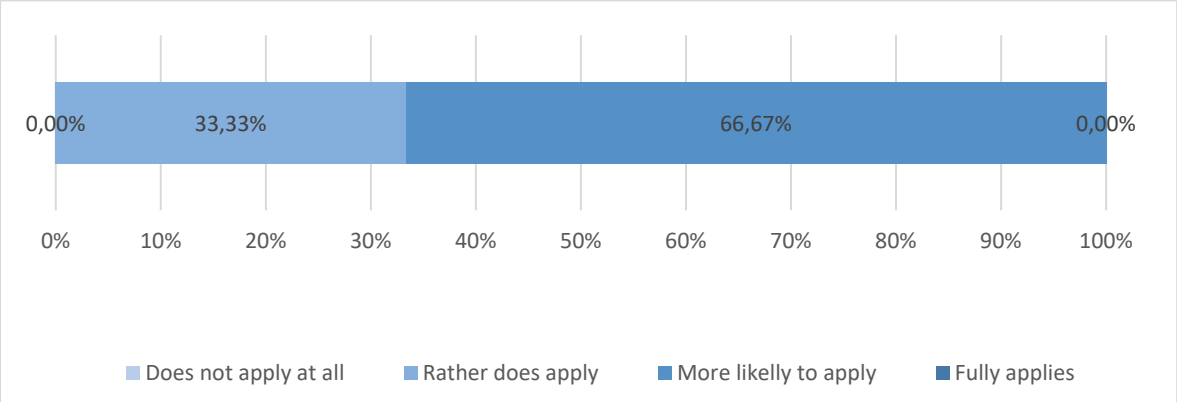


Figure 56: The time frame for completing the assignments was reasonable [n=3]

Case-based/problem-based learning

The self-directed learning based on the case studies suited me.

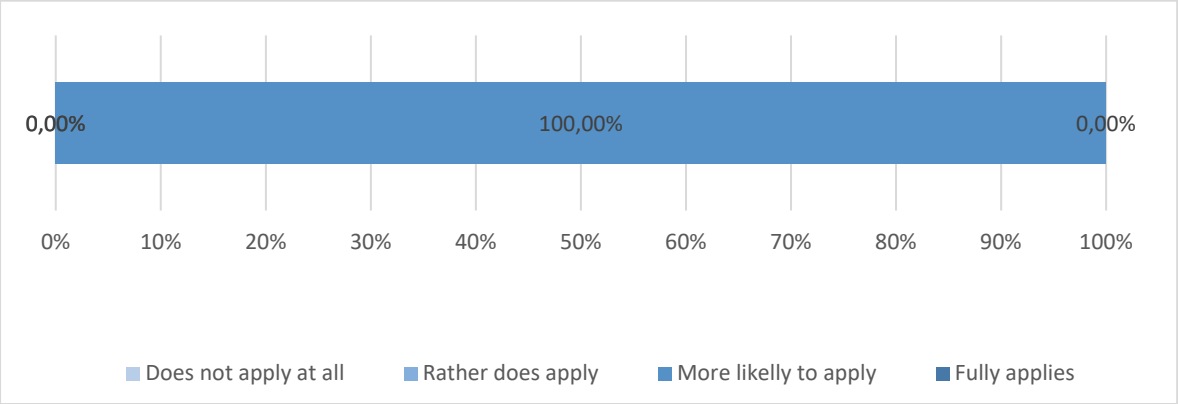


Figure 57: The self-directed learning based on the case studies suited me [n=3]

The online discussion ware useful for me to understand different perspectives.

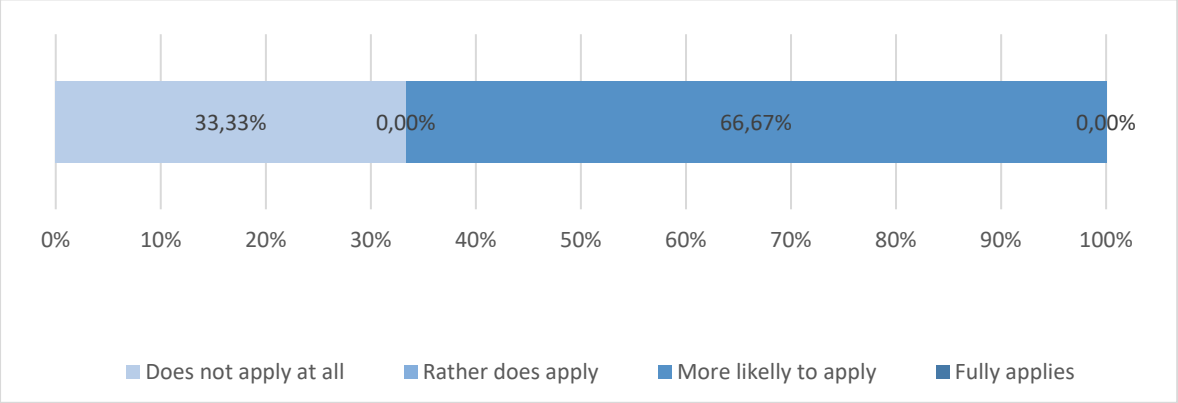


Figure 58: The online discussion ware useful for me to understand different perspectives [n=3]

The course dealt with real problem situations and everyday situations related to the subject to be studied.

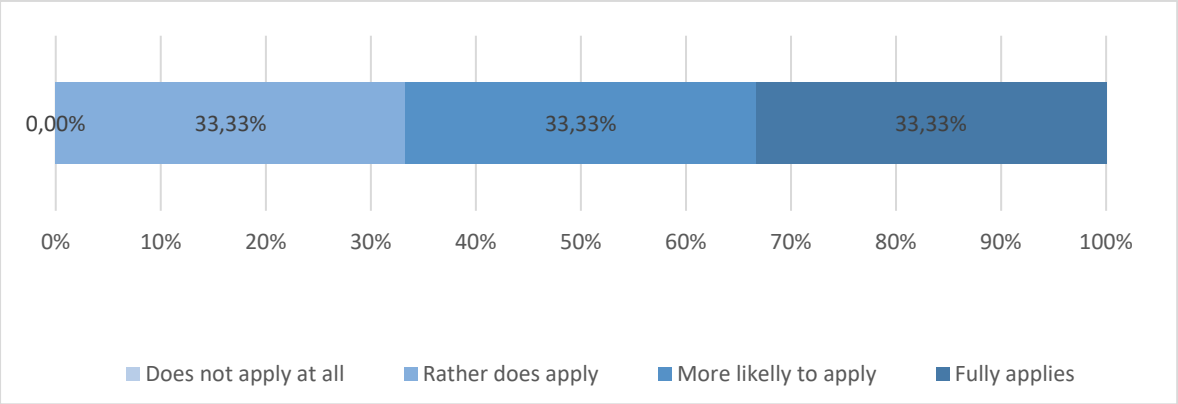


Figure 59: The course dealt with real problem situations and everyday situations related to the subject to be studied [n=3]

I researched and used various sources to answer the learning objectives.

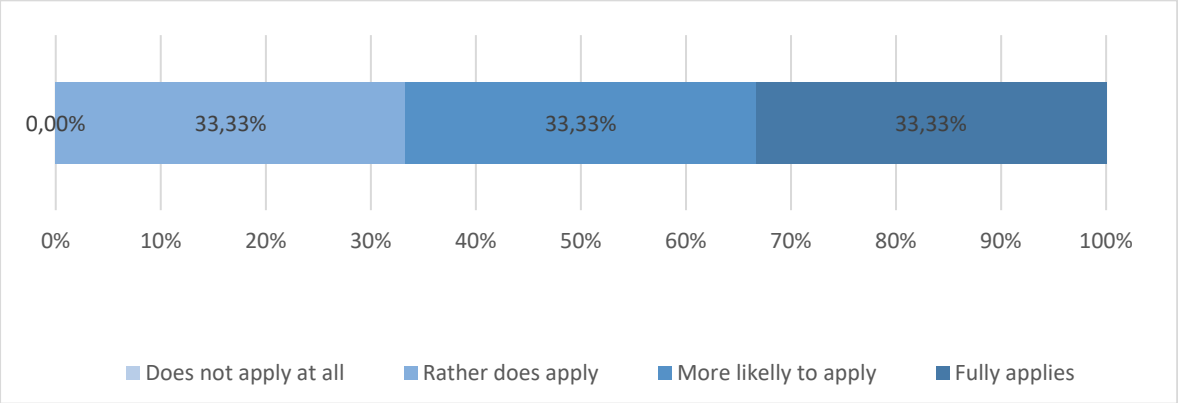


Figure 60: I researched and used various sources to answer the learning objectives [n=3]

Moodle/e-Learning

The Moodle learning platform is user-friendly.

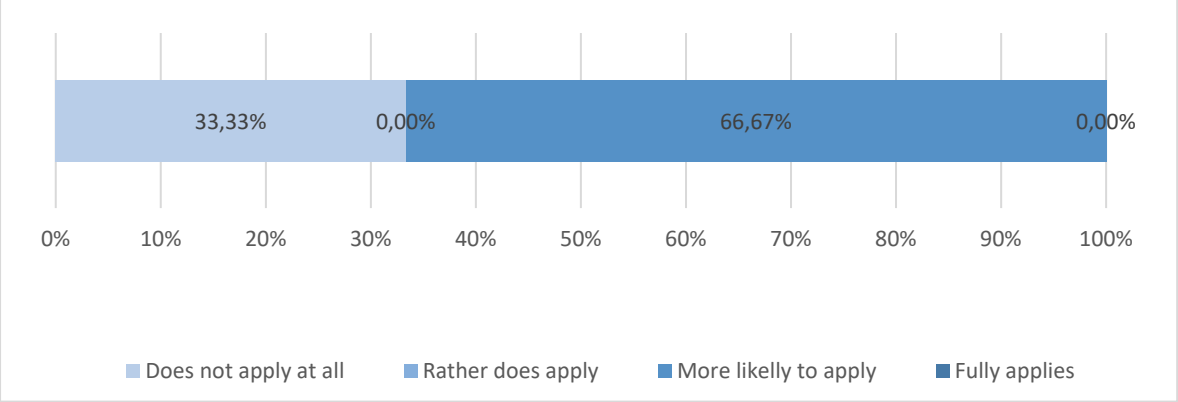


Figure 61: The Moodle learning platform is user-friendly [n=3]

The information I was looking for is easy to find in Moodle.

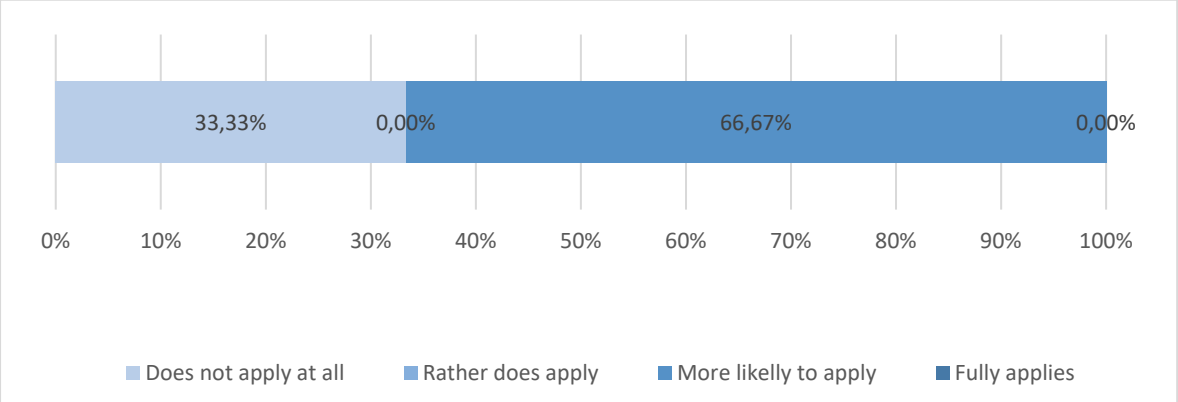


Figure 62: The information I was looking for is easy to find in Moodle [n=3]

The content in Moodle is presented in a comprehensible way.

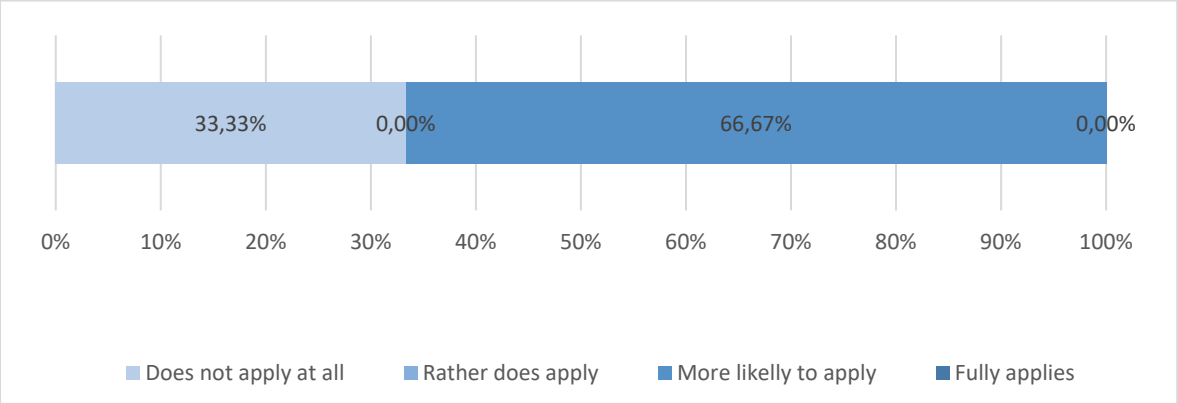


Figure 63: The content in Moodle is presented in a comprehensible way [n=3]

Finding my way through Moodle was easy.

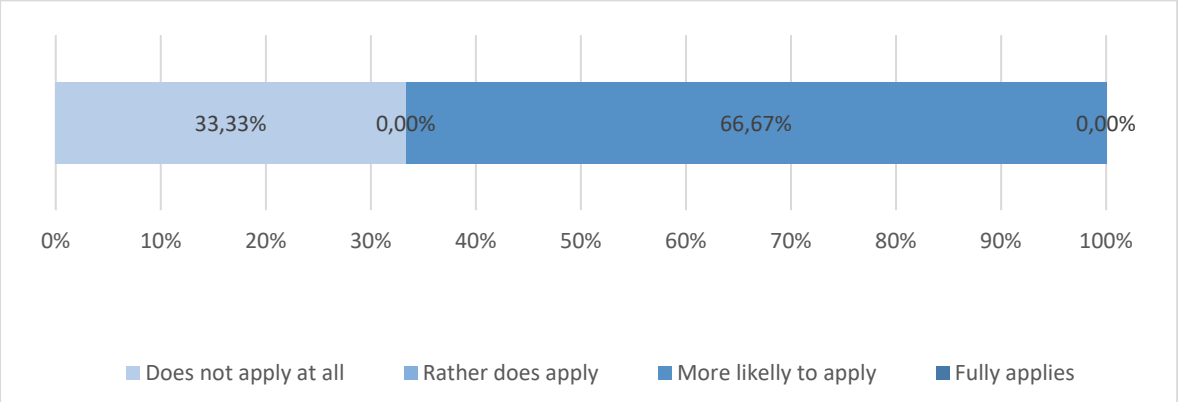


Figure 64: Finding my way through Moodle was easy [n=3]

It took more time to work with Moodle than I expected.

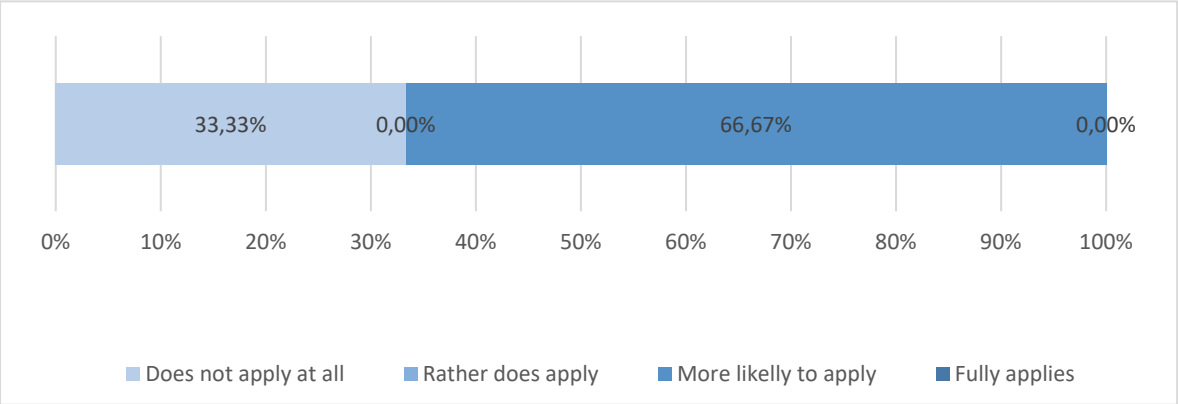


Figure 65: It took more time to work with Moodle than I expected [n=3]

I felt comfortable communicating online.

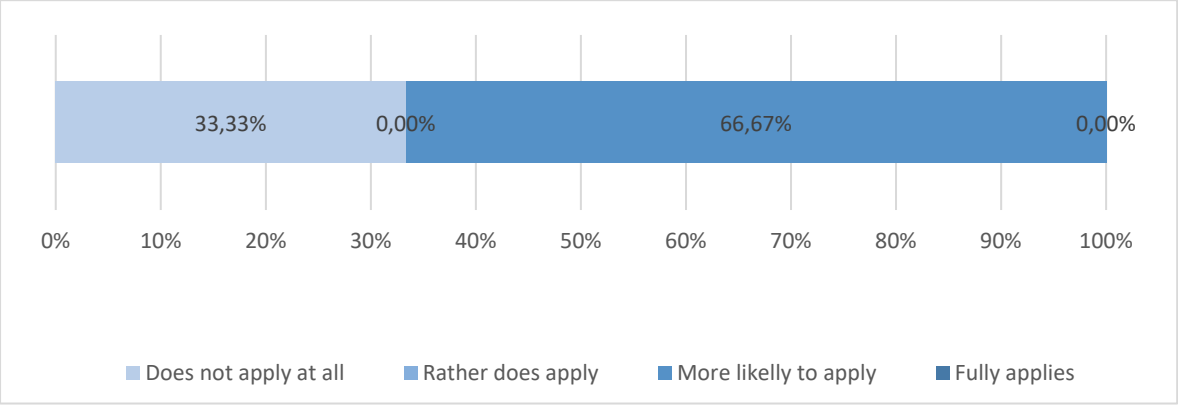


Figure 66: I felt comfortable communicating online [n=3]

I received helpful support with technical questions.

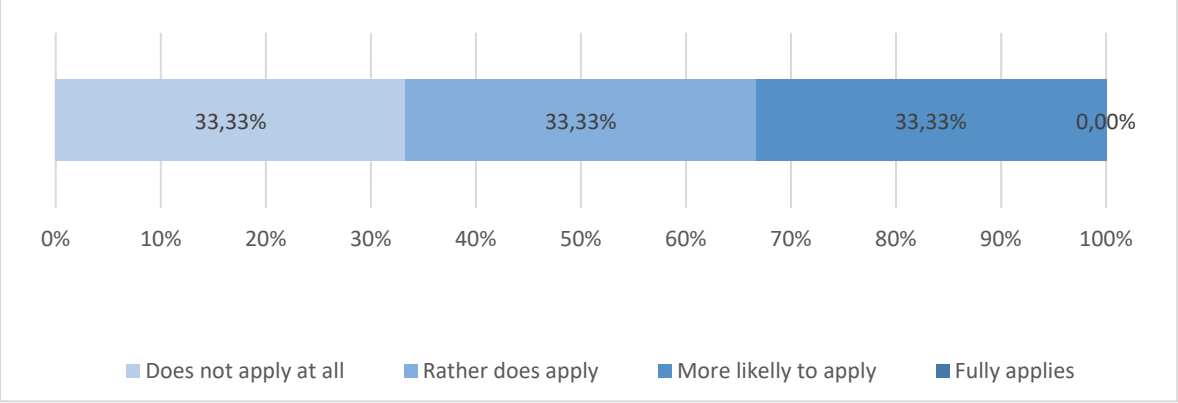


Figure 67: I received helpful support with technical questions [n=3]

The learning platform supported the exchange with the other participants.

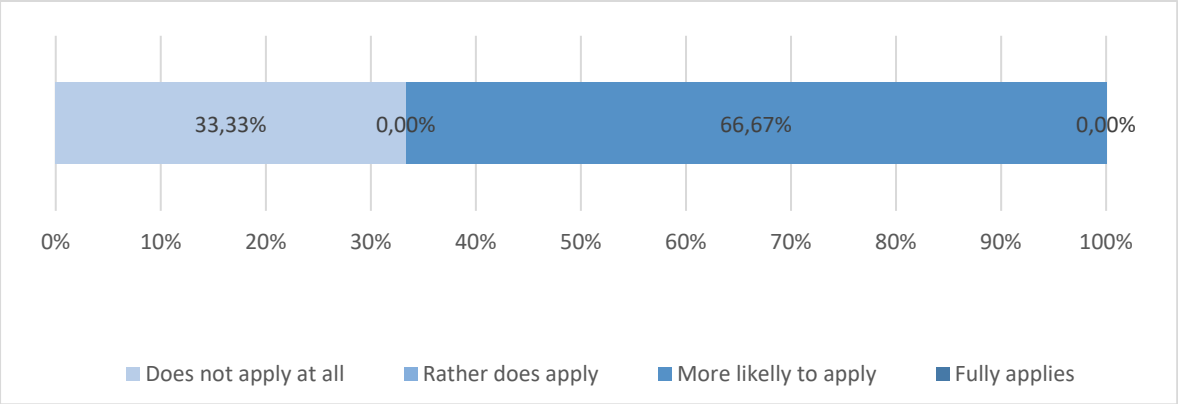


Figure 68: The learning platform supported the exchange with the other participants [n=3]

The teacher guided studying and learning expertly in e-learning/Moodle environment.

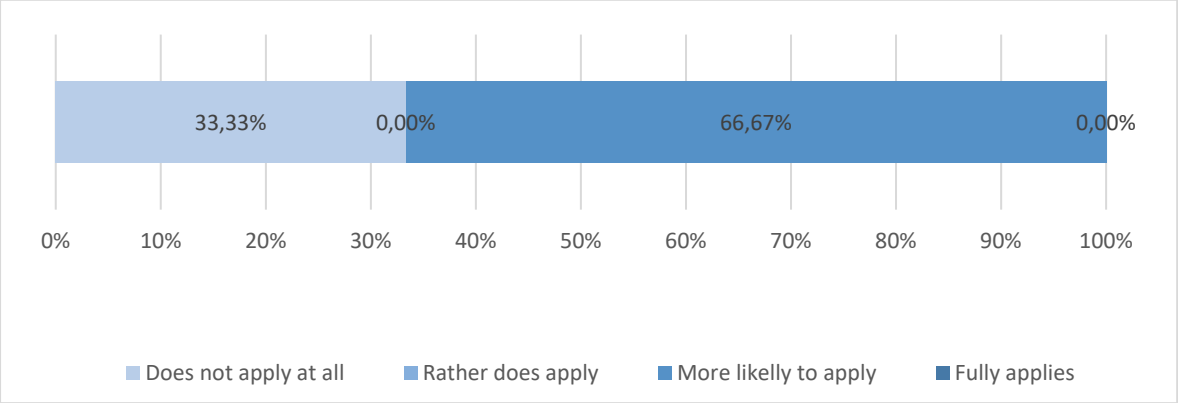


Figure 69: The teacher guided studying and learning expertly in e-learning/Moodle environment [n=3]

I used the e-learning environment/Moodle in that way the teacher guided.

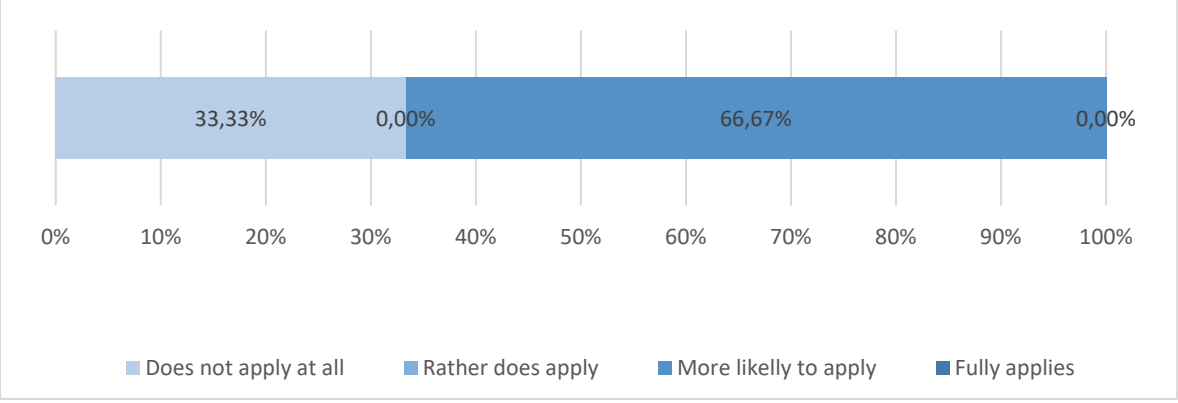


Figure 70: I used the e-learning environment/Moodle in that way the teacher guided [n=3]

Studying in the online course has improved my skills to use information and communication technology.

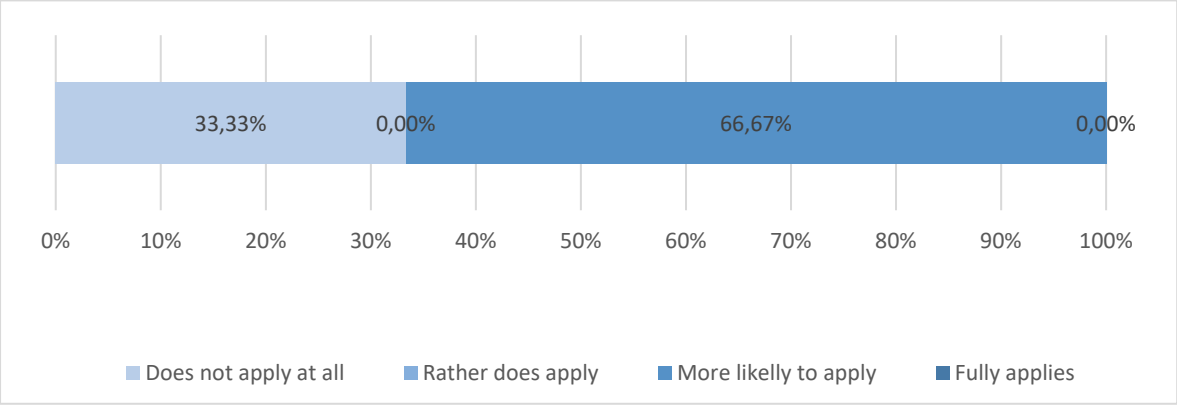


Figure 71: Studying in the online course has improved my skills to use information and communication technology [n=3]

The online environment/Moodle helped me to improve my teamwork skills.

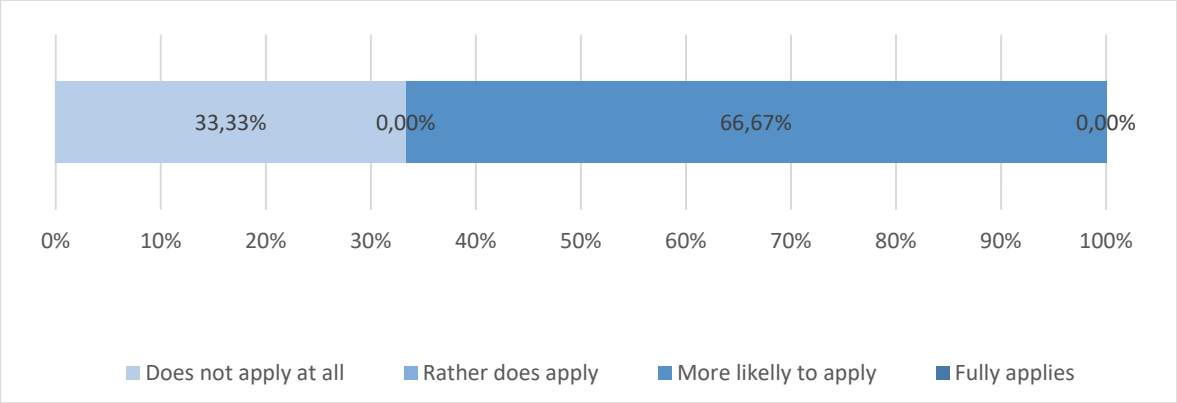


Figure 72: The online environment/Moodle helped me to improve my teamwork skills [n=3]

2.3 Course expectations

Through the course, I have …

… gained new theoretical knowledge

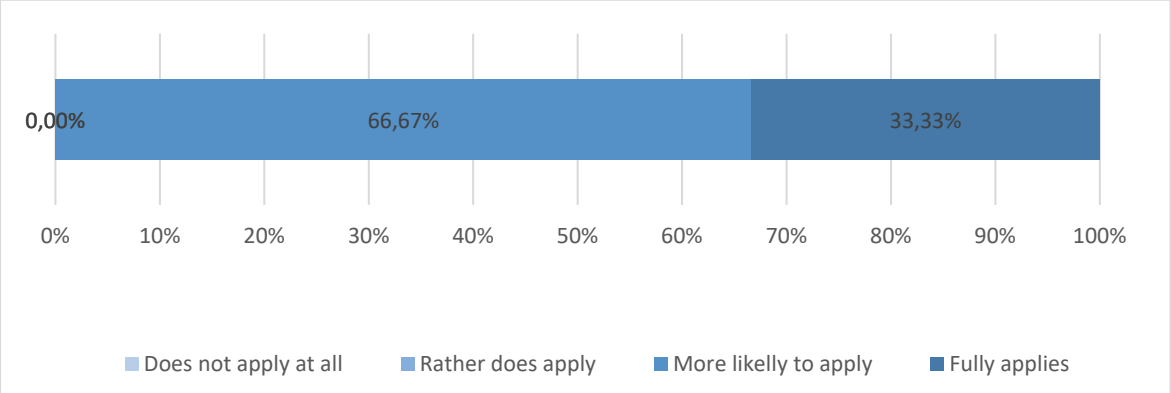


Figure 73: … gained new theoretical knowledge [n=3]

… made new (and helpful) contacts.

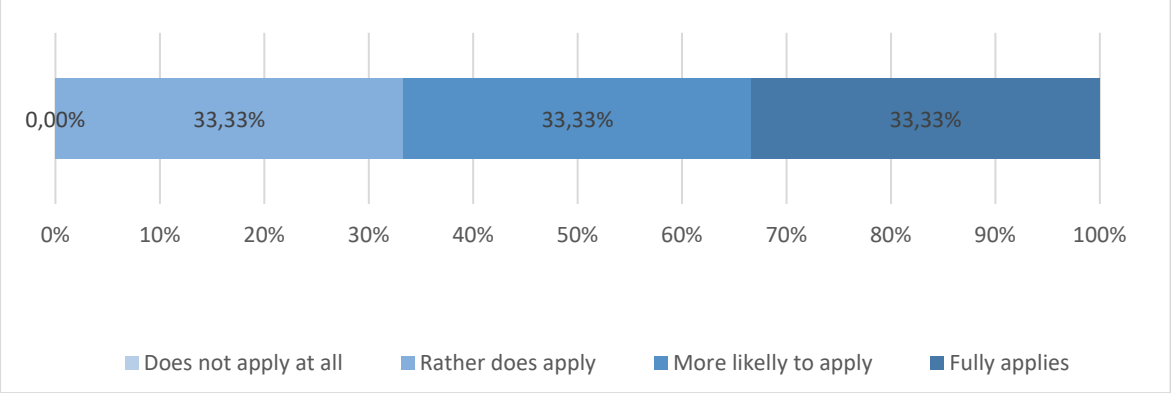


Figure 74: … made new (and helpful) contacts [n=3]

… gained new knowledge for my studies.

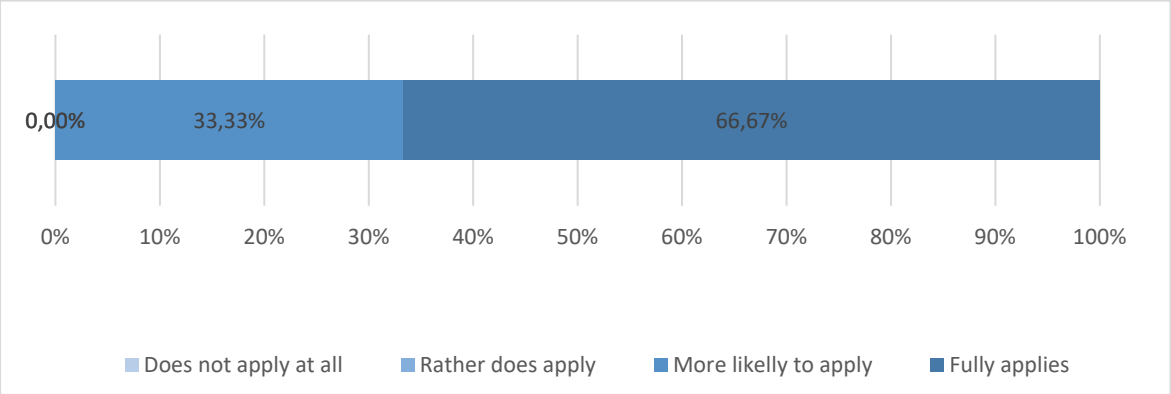


Figure 75: … gained new knowledge for my studies [n=3]

… received individual support.

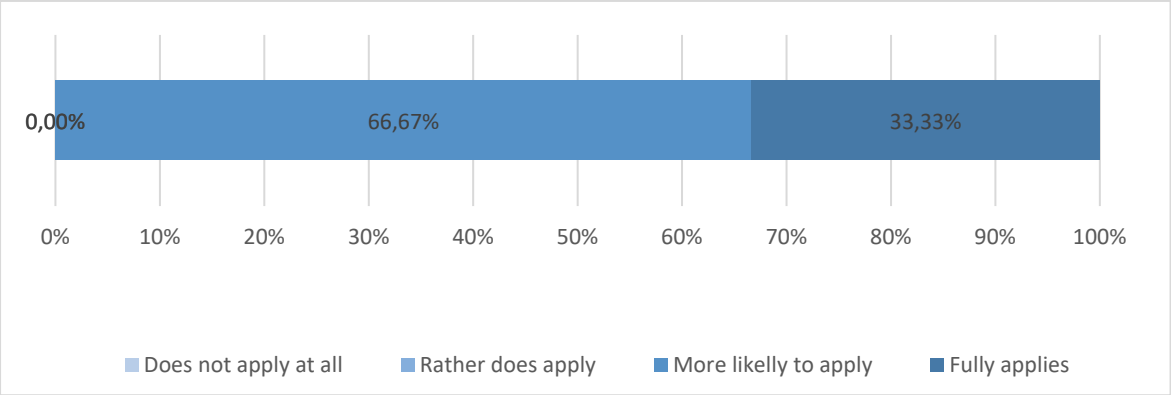


Figure 76: … received individual support [n=3]

… got helpful impulses for my studies.

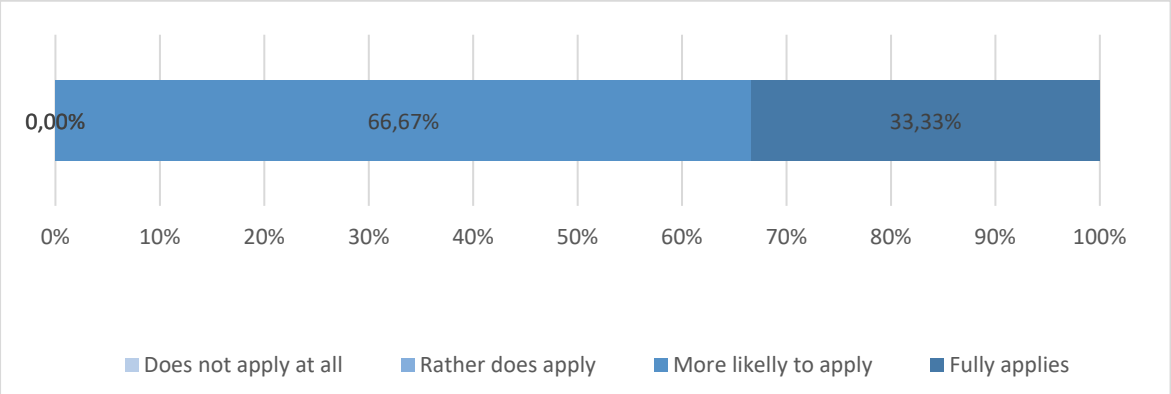


Figure 77: … got helpful impulses for my studies [n=3]

2.4 Experience with the course

… appropriately acquired instruments and methods to better address Health Information Systems Interoperability issues.

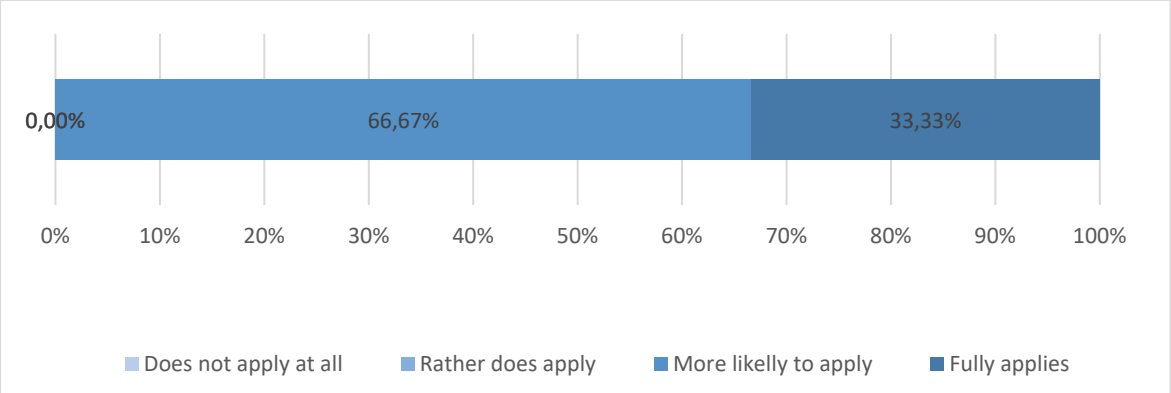


Figure 78: … appropriately acquired instruments and methods to better address Health Information Systems Interoperability issues [n=3]

I am able to characterise the mais obstacles to information exchange between Health Organisations and their Health Information Systems.

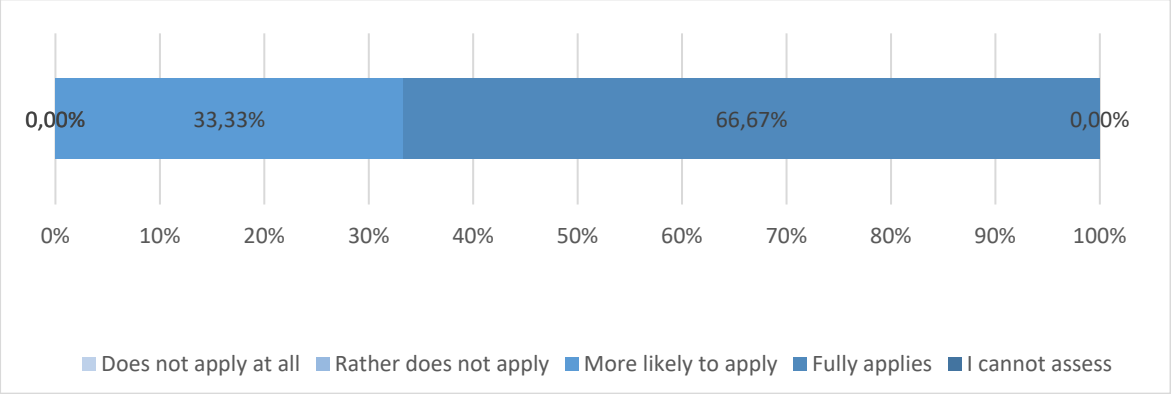


Figure 79: I am able to characterise the mais obstacles to information exchange between Health Organisations and their Health Information Systems [n=3]

I can identify the main consequences to patients and health organisations originating from the lack of interoperability].

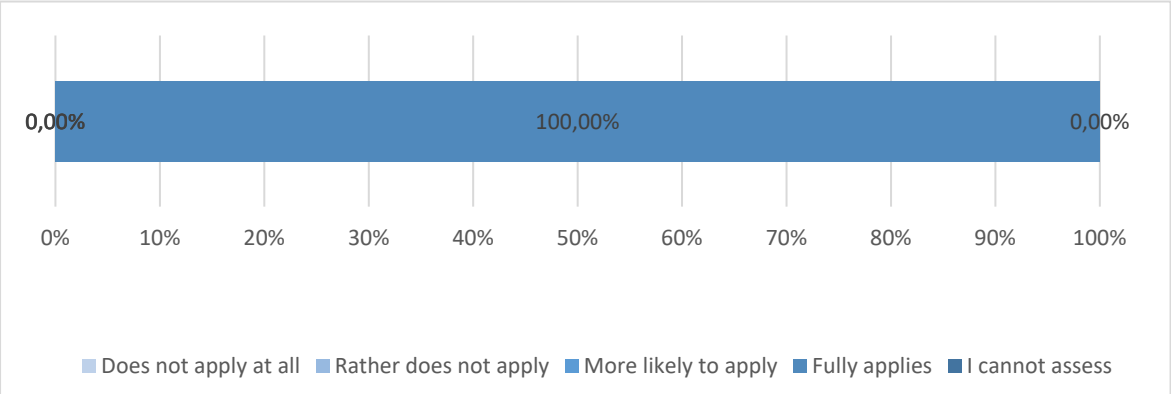


Figure 80: I can identify the main consequences to patients and health organisations originating from the lack of interoperability] [n=3]

I am able to define the concept of interoperability in Healthcare.

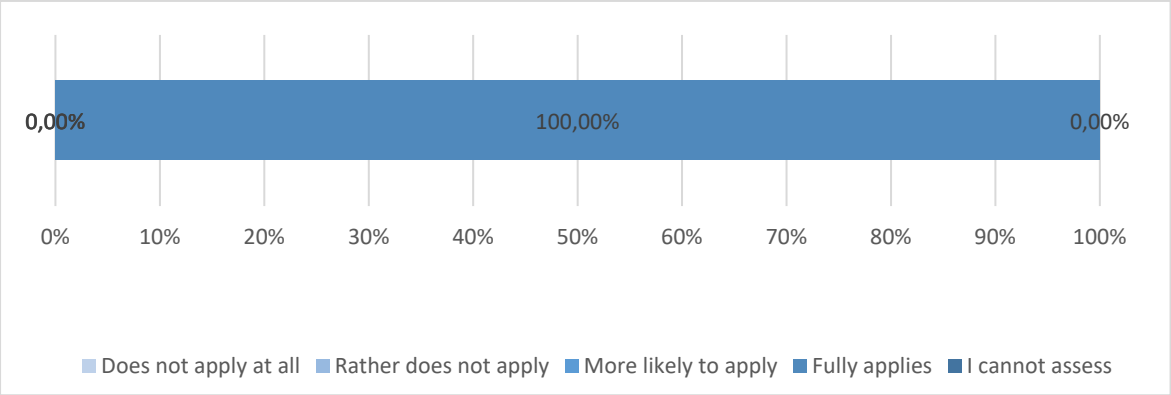


Figure 81: I am able to define the concept of interoperability in Healthcare [n=3]

I can identify the different levels of interoperability.

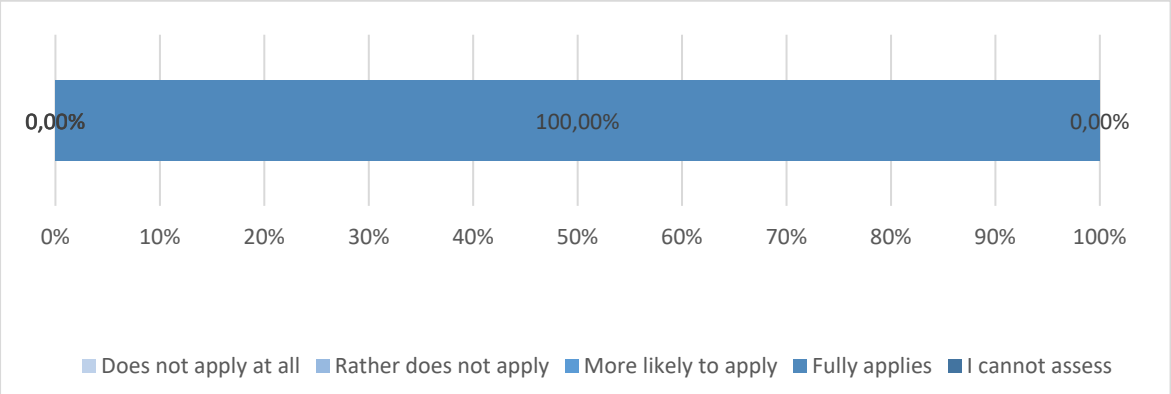


Figure 82: I can identify the different levels of interoperability [n=3]

I am able to identify the main standards used in health interoperability

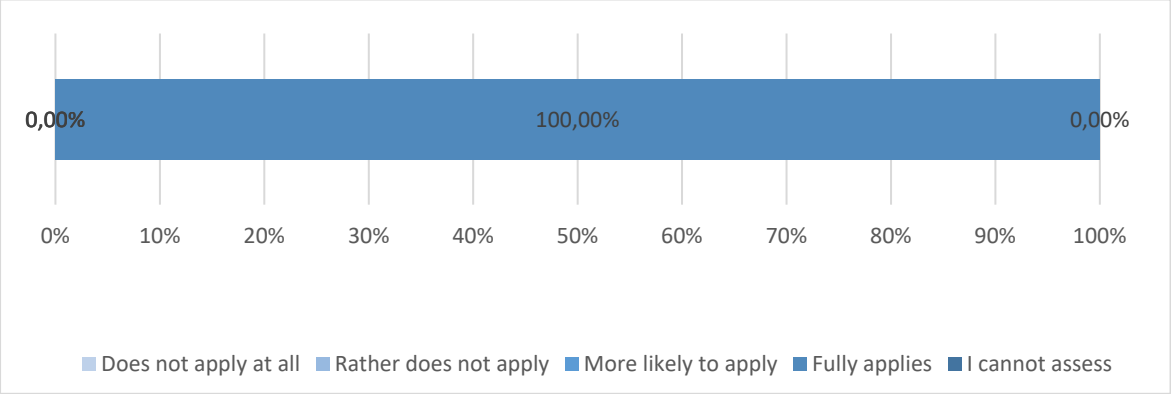


Figure 83: I am able to identify the main standards used in health interoperability [n=3]

I am able to summarize the main differences among the different standards.

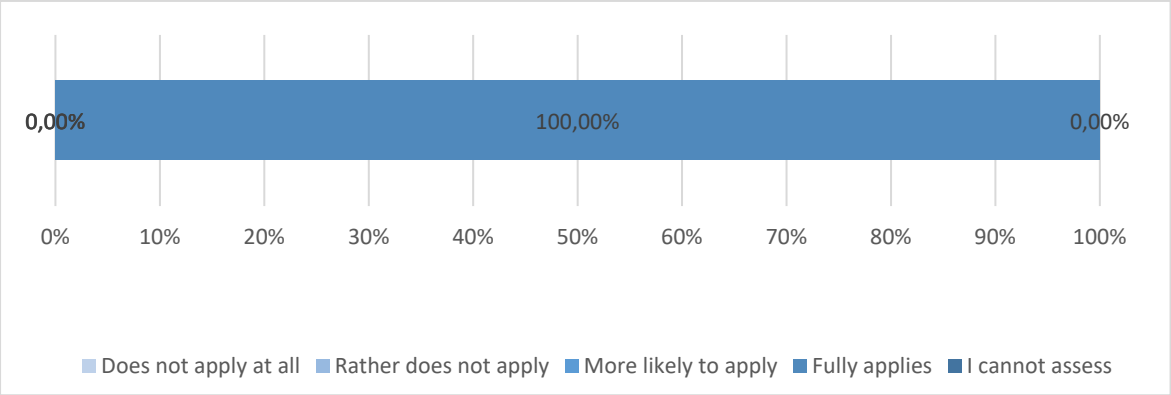


Figure 84: I am able to summarize the main differences among the different standards. [n=3]

I know what HL7 means.

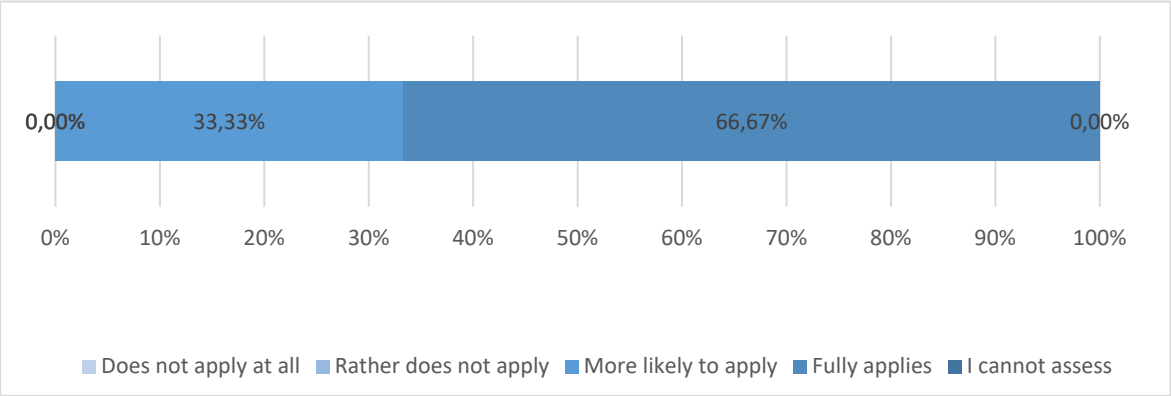


Figure 85: I know what HL7 means [n=3]

I can describe the main concepts of HL7 v2 and how it works.

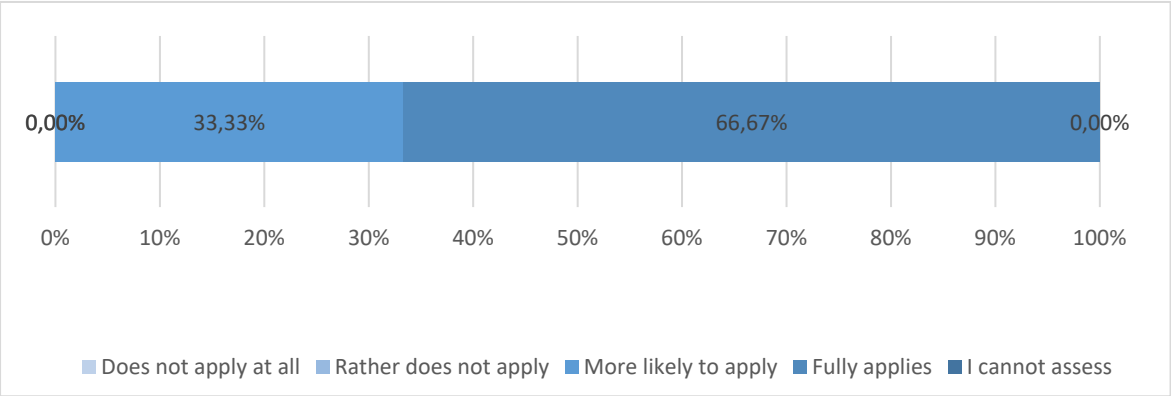


Figure 86: I can describe the main concepts of HL7 v2 and how it works [n=3]

I know what FHIR means.

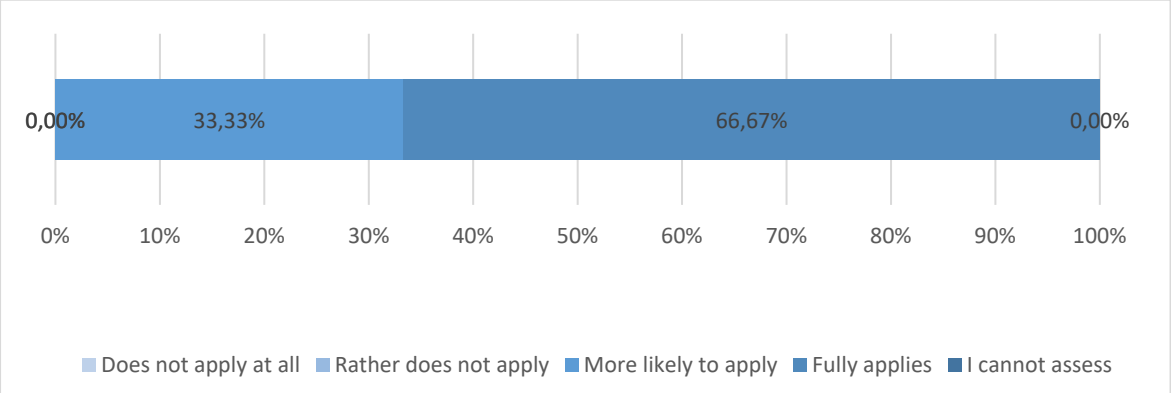


Figure 87: I know what FHIR means [n=3]

I can describe the main concepts of FHIR and how it works.

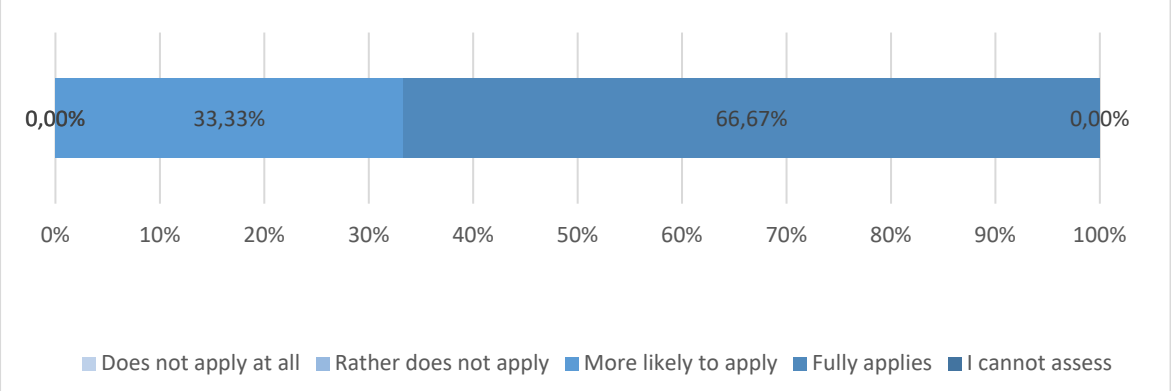


Figure 88: I can describe the main concepts of FHIR and how it works [n=3]

I know what openEHR means.

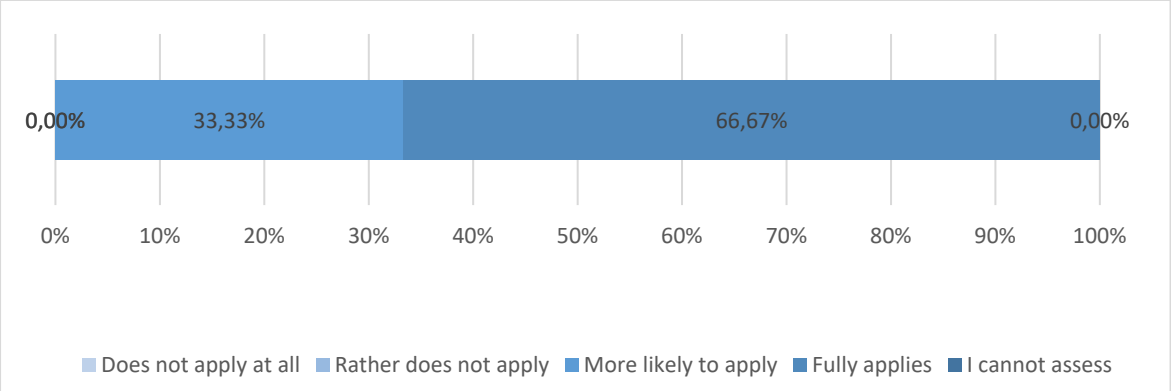


Figure 89: I know what openEHR means [n=3]

I can describe the main concepts of openEHR and how it works].

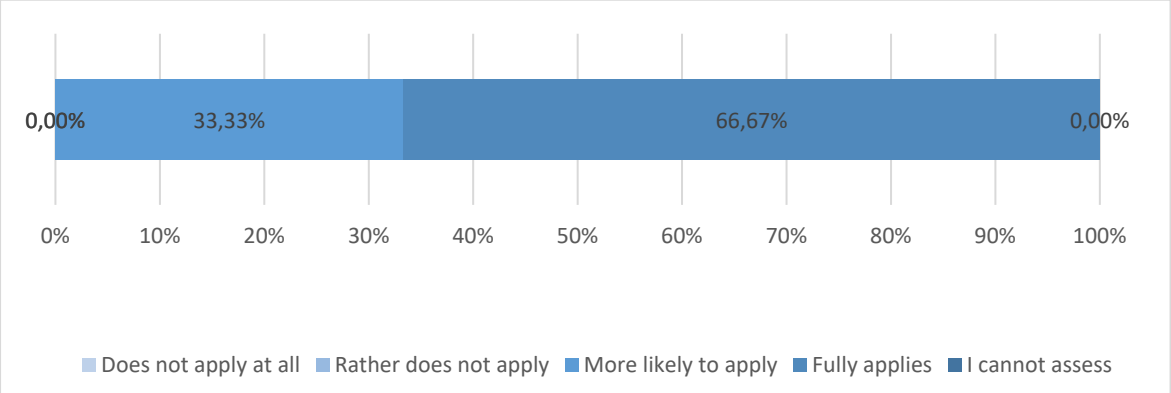


Figure 90: I can describe the main concepts of openEHR and how it works] [n=3]

I know what SNOMED means.

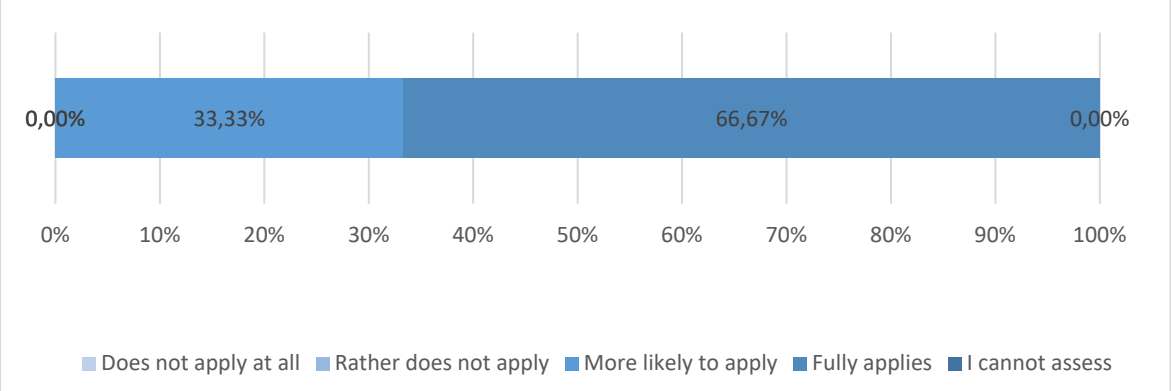


Figure 91: I know what SNOMED means [n=3]

I can understand code systems an how they work.

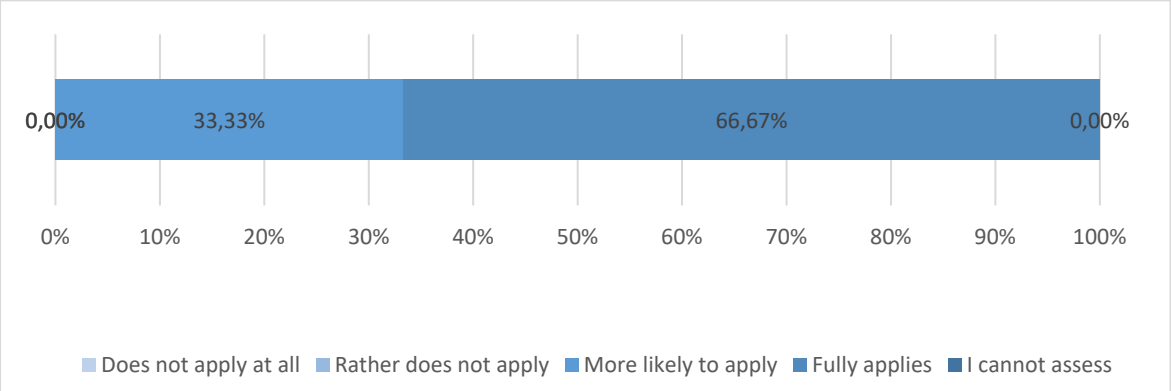


Figure 92: I can understand code systems an how they work [n=3]

I can associate the different standards to different levels of interoperability.

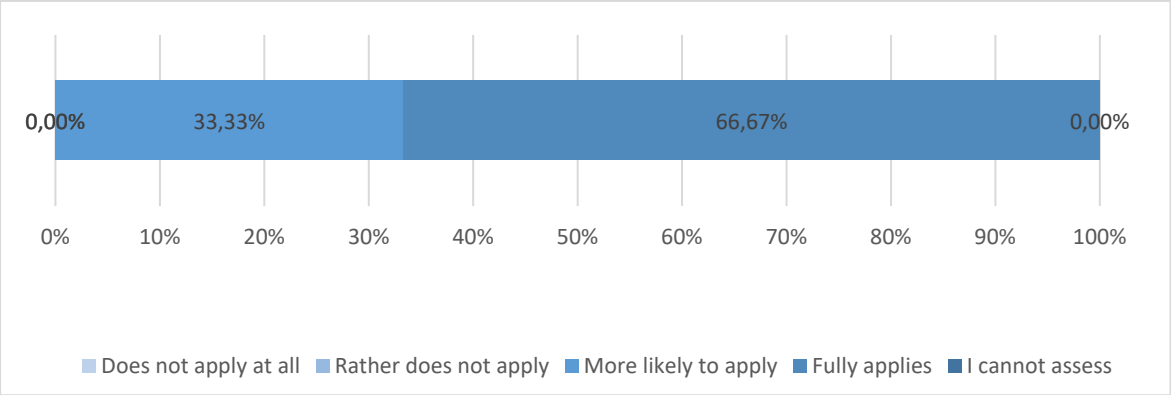


Figure 93: I can associate the different standards to different levels of interoperability [n=3]

2.5 Overall assessment

I would recommend the course to other students/professionals.

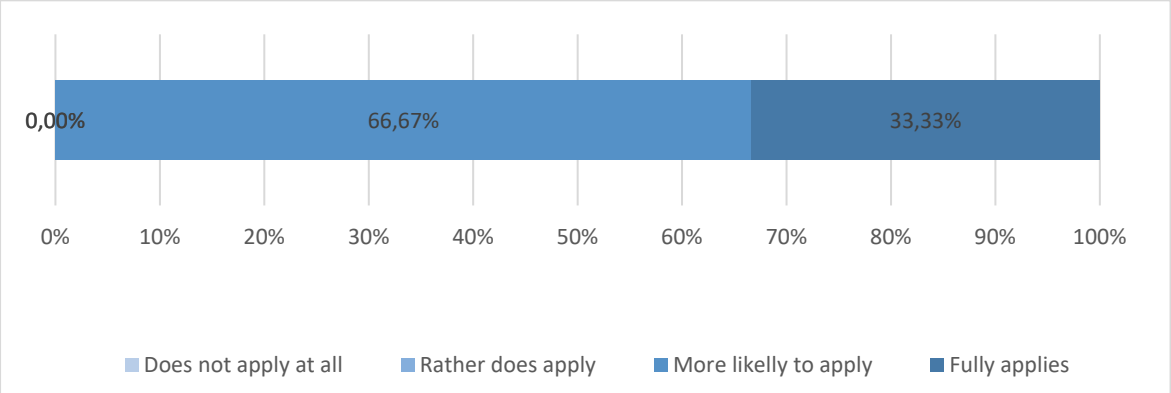


Figure 94: I would recommend the course to other students/professionals [n=3]

From my point of view, there was a good balance between effort and benefit of the course.

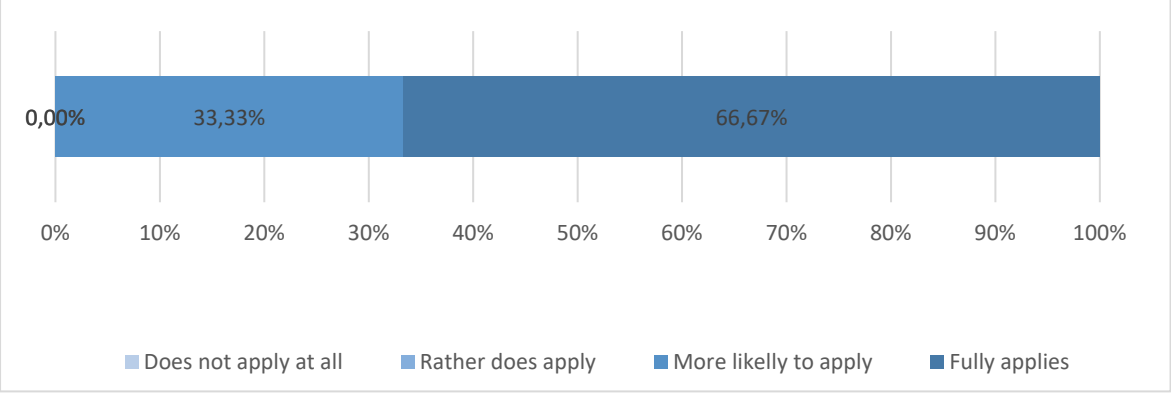


Figure 95: From my point of view, there was a good balance between effort and benefit of the course [n=3]

From my point of view, such course offerings are very well suited to increase competencies in the area of clinical data analytics.

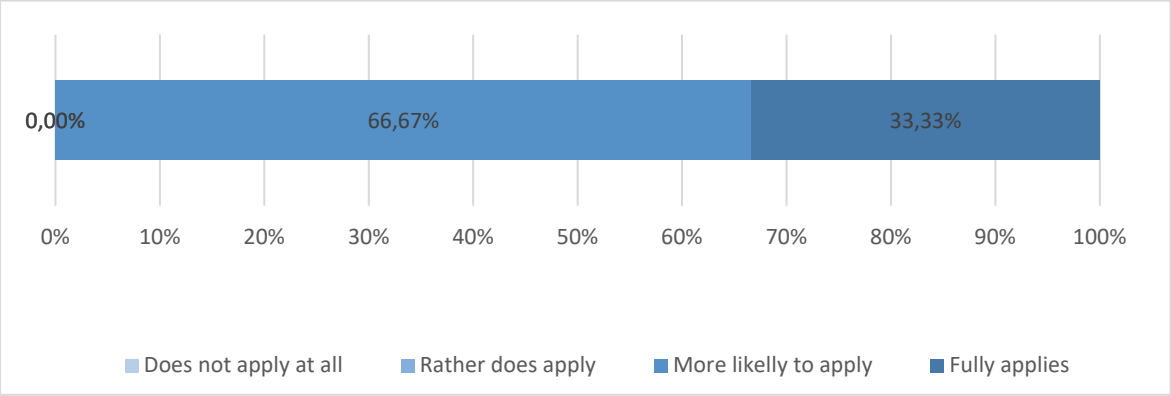
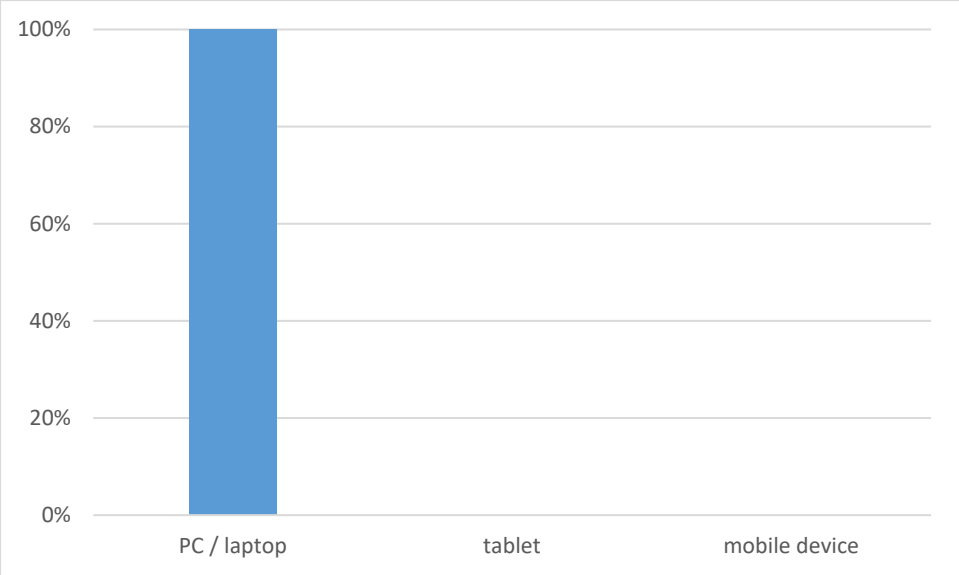


Figure 96: From my point of view, such course offerings are very well suited to increase competencies in the area of clinical data analytics [n=3]

Which technical device did you use to work on the e-learning content?



3 Appendix: questionnaires

Evaluation

Evaluation of the Online courses

Authors: Johanna Ikonen, Tiina Jokinen, Ulla-Mari Kinnunen, Kaija Saranto

University of Eastern Finland

Co-funded by the Erasmus+ Programme of the European Union

Table of contents

1 Introduction

In this paper are the results of evaluation in online courses at eHealth4all@EU project. The paper is part of the evaluation of the project.

The base of the evaluation has been created from main themes of the program guide of Erasmus+ and the aims of eHealth4all@EU. The figure below presents these themes (Figure 1). Main themes are “inclusion and diversity”, “digital dimension”, and “environmental sustainability”. The evaluation considers these main themes and the aims of the project like problem-based learning, inter-professional education, and eHealth.

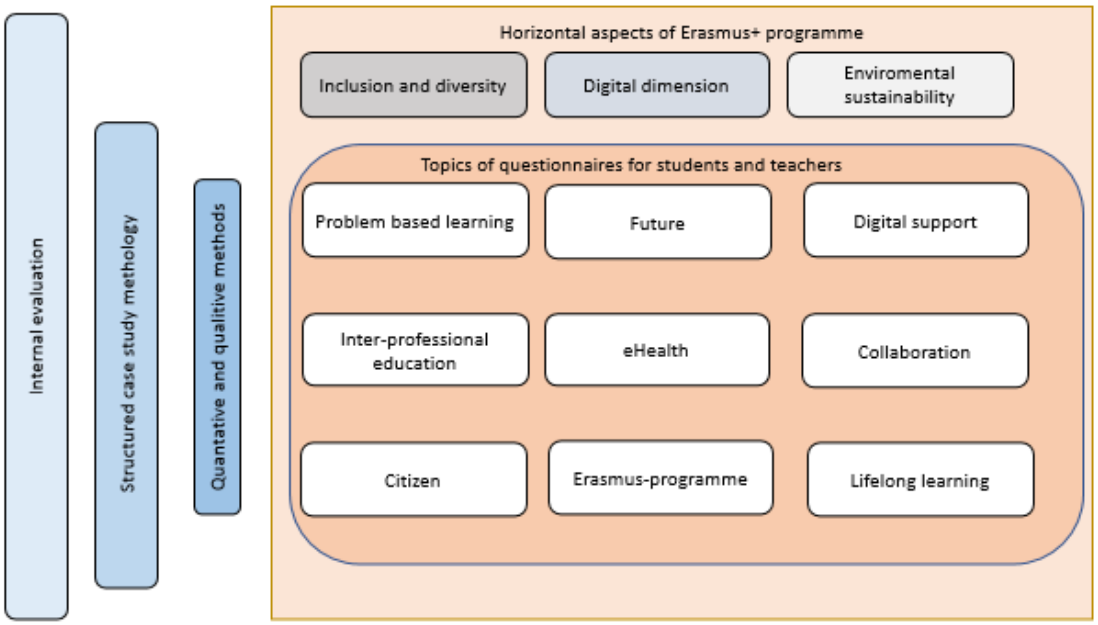


Figure 1: The Topics of questionnaires

There were three online courses during the project. Topics of these courses were “Clinical data analytics”, “Data protection and security” and “Interoperability”. Students and teachers responded surveys after every online course. There were separate surveys for students and teachers. Both surveys included same themes, but the questions were different.

This paper includes three parts. At the first part students’ responses are presented (n = 8) (Chapter 2). Second part includes teachers’ responses (n = 2) (Chapter 3), and the last part combines students’ and teachers’ responses (n = 10) (Chapter 4). Exception is the question “These studies will support me at the labour market” was only for students.

This paper includes only the results of these surveys. The analysis is presented at the report of evaluation. The questionnaires have been enclosed at the end of this paper as appendixes.

Open answers are summarized, and some parts of responses are hidden by XX to protect respondent anonymity.

2 Students

2.1 Background

Age (n=8)

Mean 44,5 years

Gender

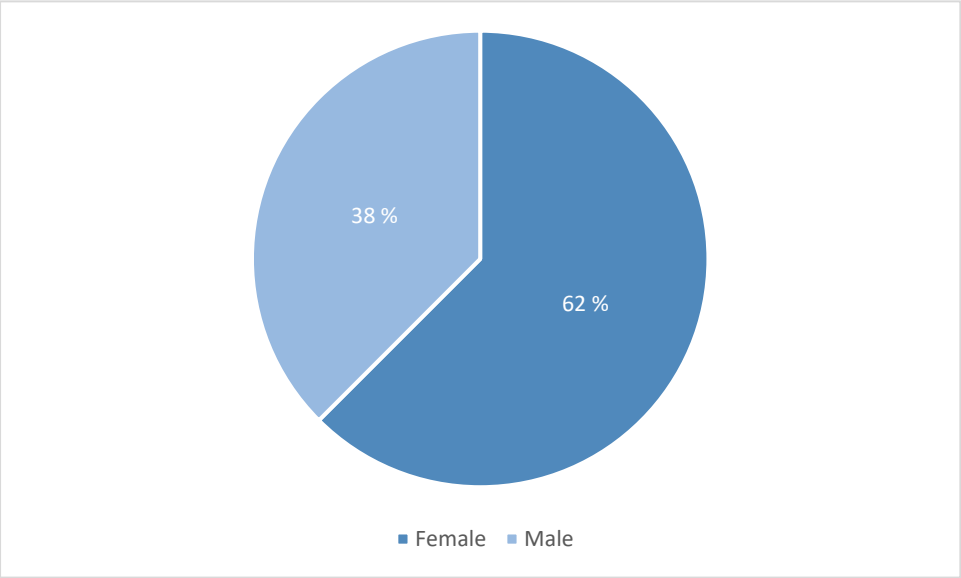


Figure 2: Gender [n = 8]

Mother tongue

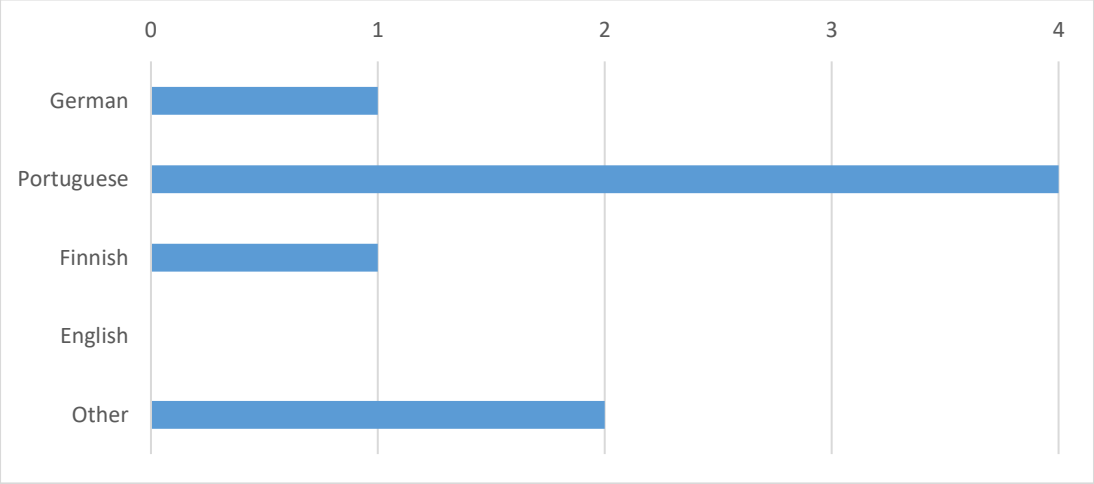


Figure 3: Mother tongue [n = 8]

Education (n=8)

Figure 4: Education [n = 8]

Current degree level

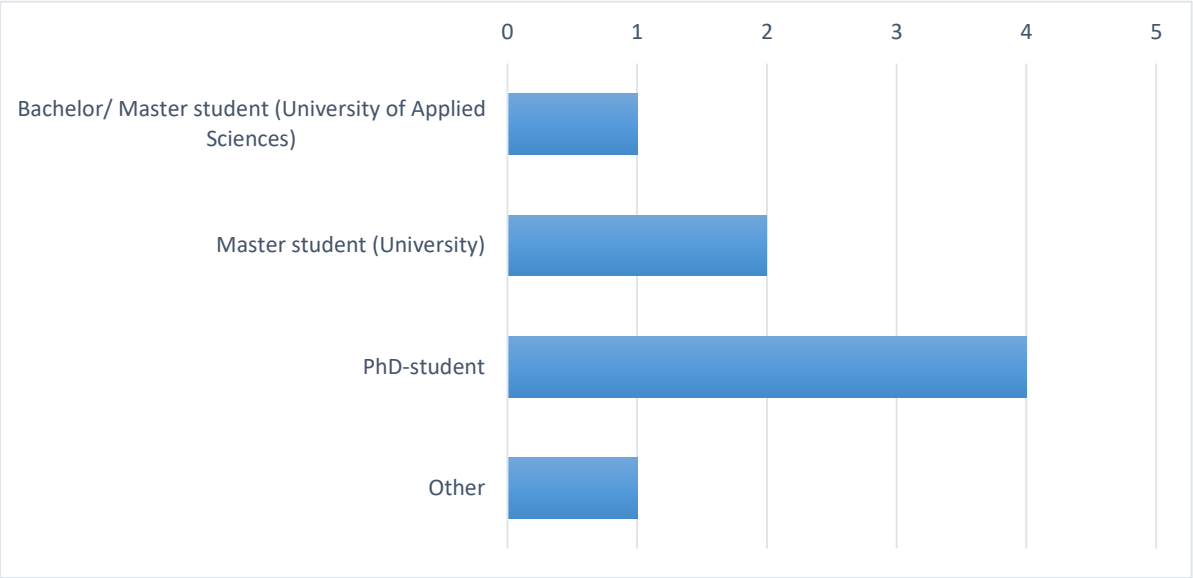


Figure 5: Current degree level [n = 8]

Questions related to background

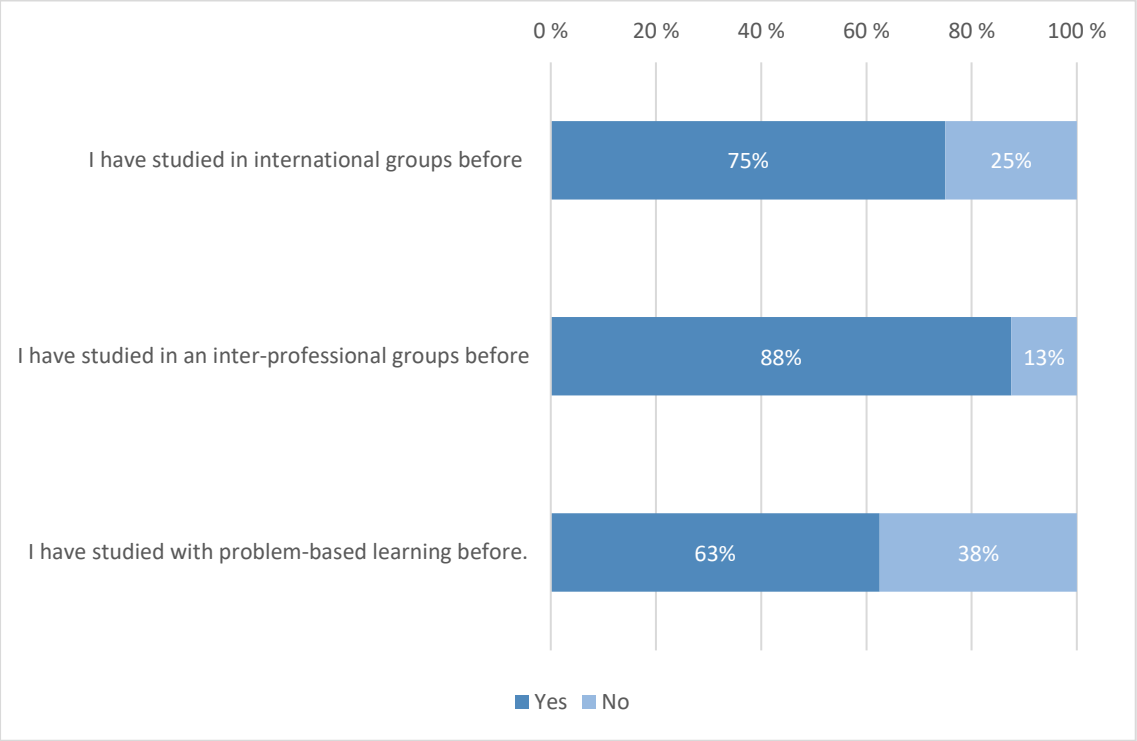


Figure 6: Study background [n = 8]

Reasons to study eHealth related issues (n=7)
- Work in the field
- Studies in the field
- Personal interests

Students own learning goals (n=7)
- To develop my knowledge in eHealth

Students heard about the course from… (n=8)
- university
- work
- Facebook/Linkedin
- friend

2.2 Questions related to learning and problem-based learning (PBL)

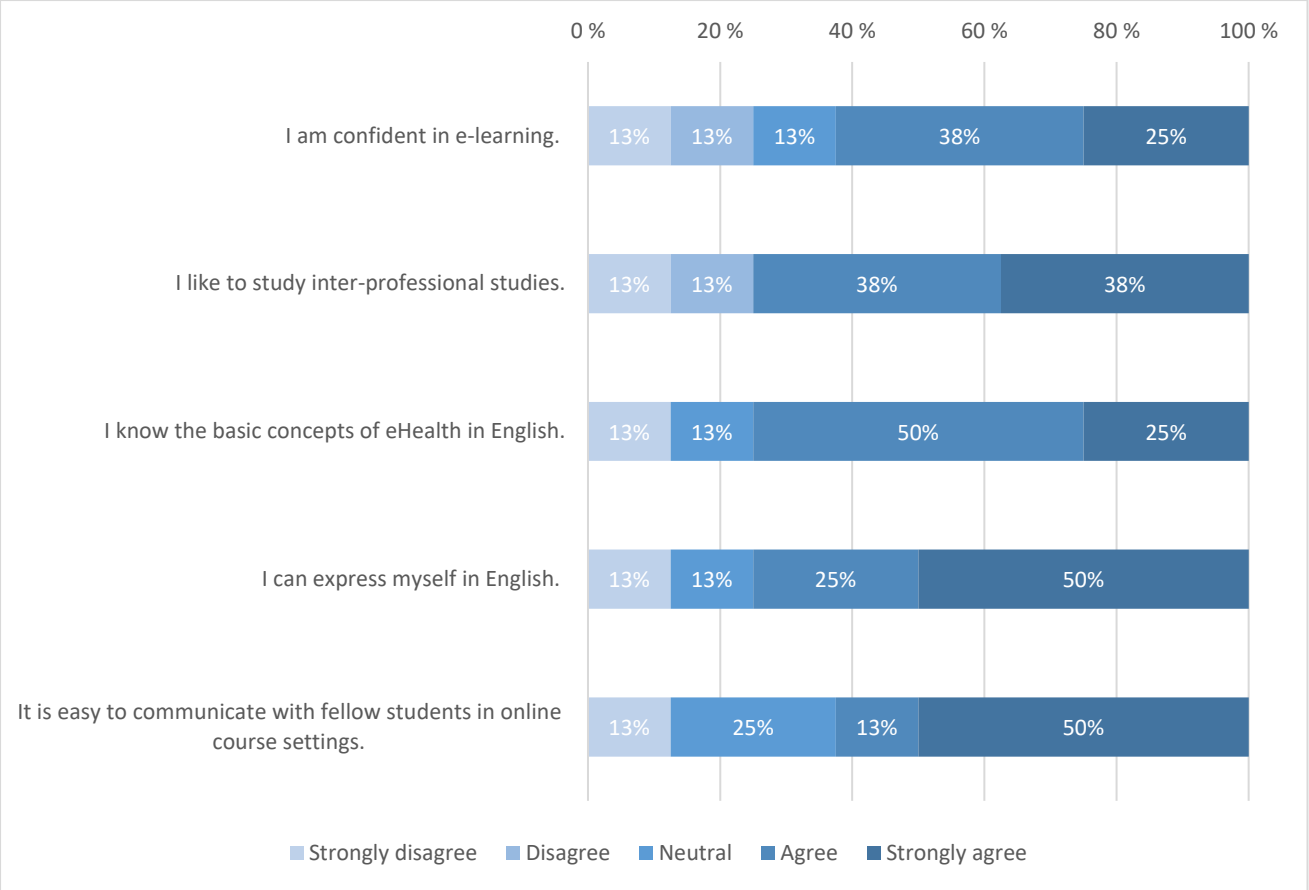


Figure 7: Questions related to learning [n = 8]

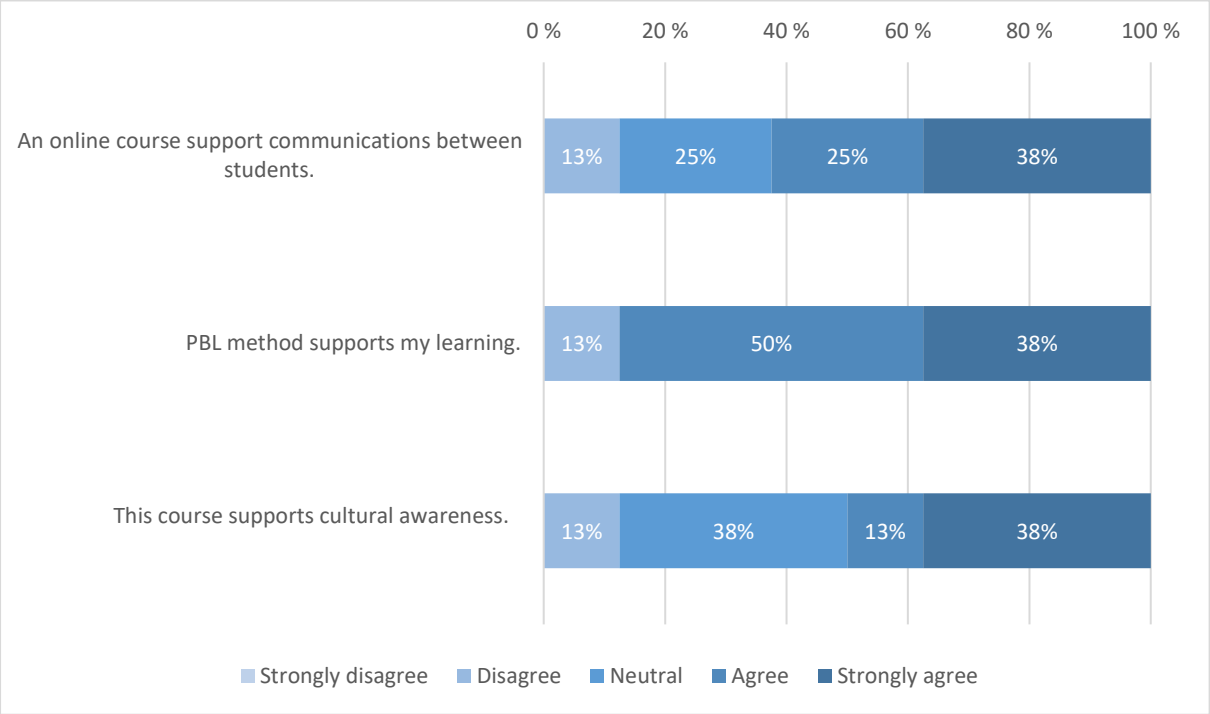


Figure 8: Questions related to learning 2 [n = 8]

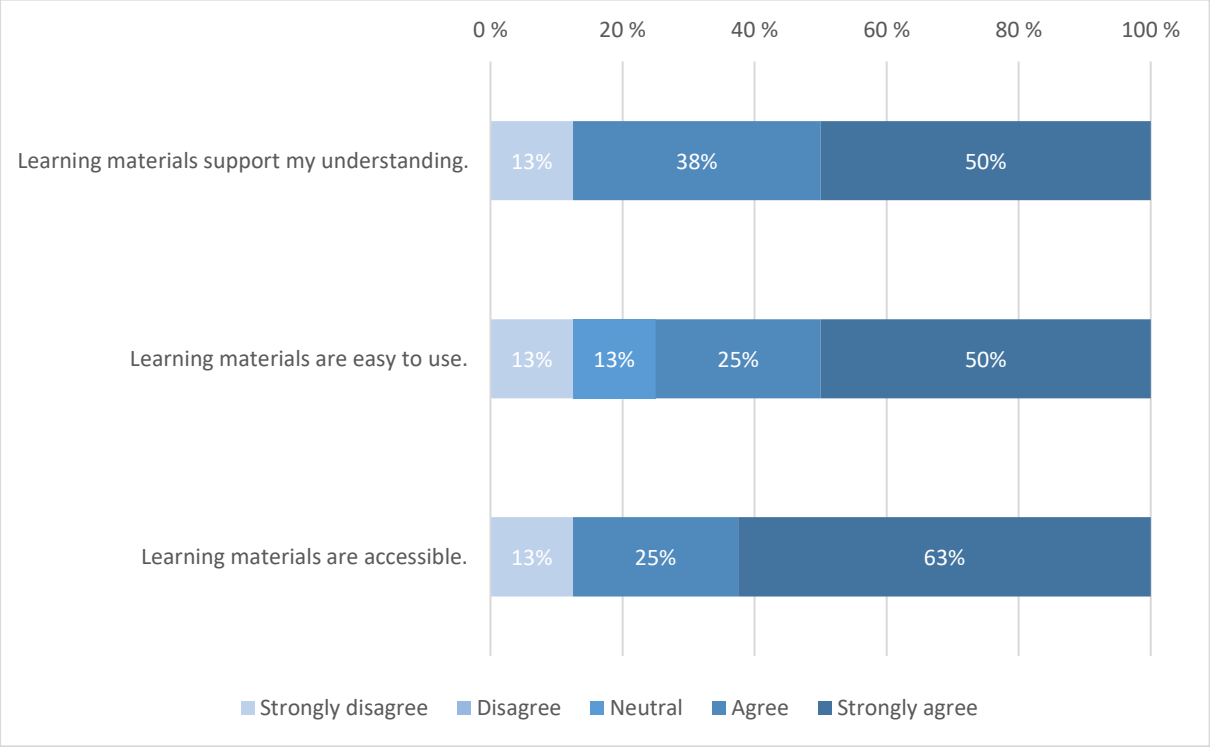


Figure 9: Questions related to learning materials [n = 8]

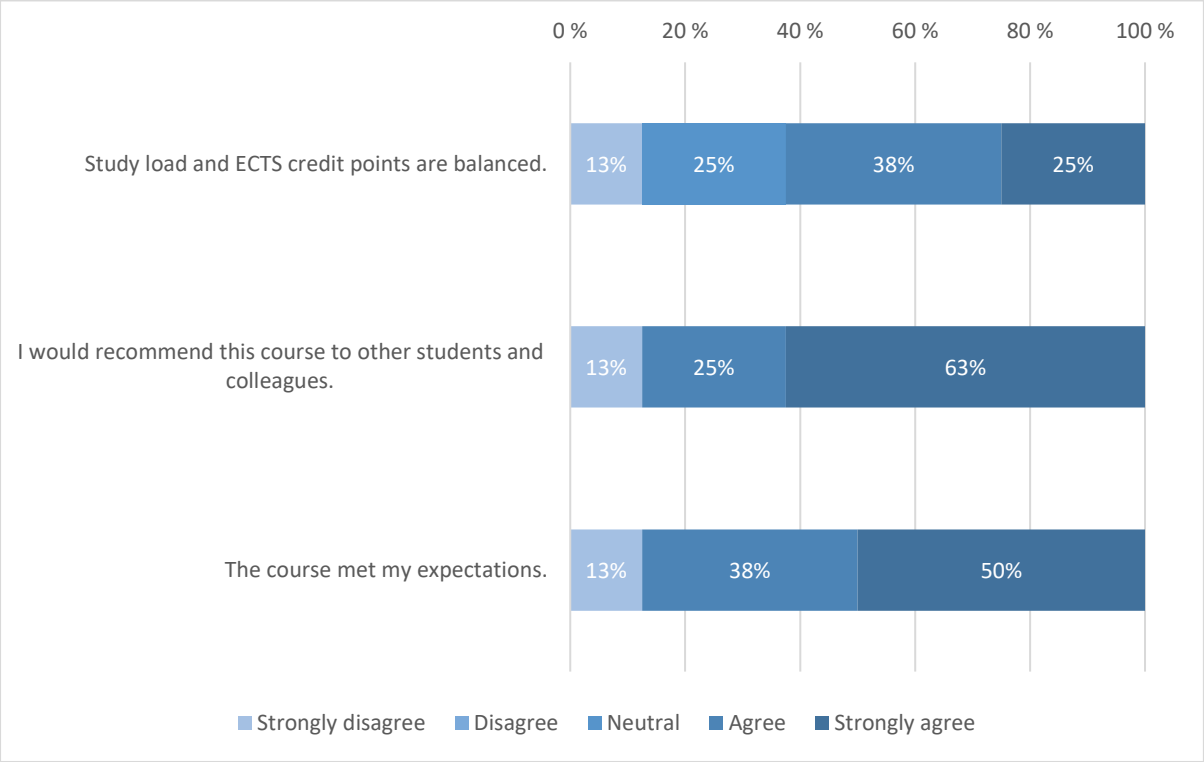


Figure 10: Questions related to the course [n = 8]

Reasons to choose this course? (n=8)

- new skills and practical contents of the course on work or studies
- free of charge
- inter-professional and international environment

Students' expectations about these studies (n=6)

- to get better understanding (about topic)
- to have a better inter-professional education in eHealth
- get to know more people interested in it

2.3 Questions related to inter-professional (IP) and inter-professional education (IPE)

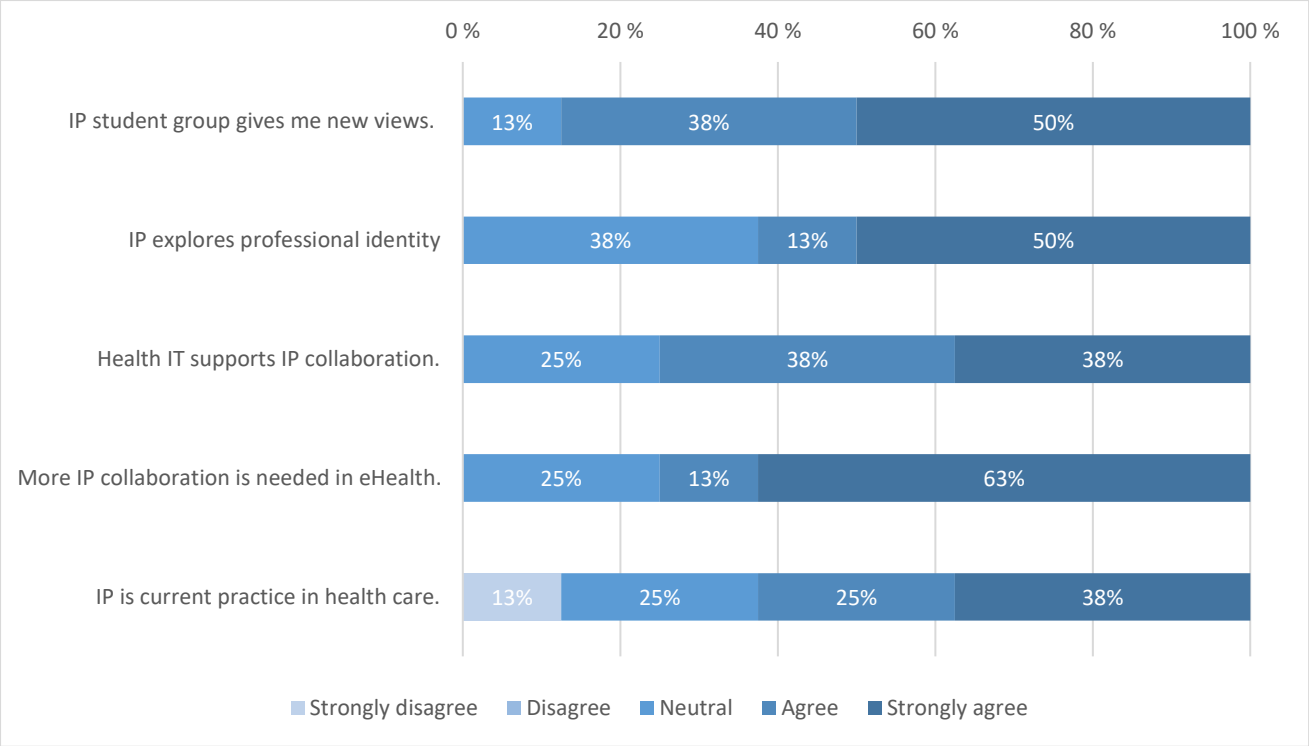


Figure 11: Questions related to inter-professional (IP) and inter-professional education (IPE) [n=8]

Students' opinion of the IPE? (n=6)

- Useful, necessary, and nowadays essential

3 Teachers

3.1 Background

Degree (n=2)

Informatics

Years worked as a teacher (n=2)

Mean 3,5 years

Field/major as a teacher (n=2)

- Statistics, Methods in Research
- Heath informatics

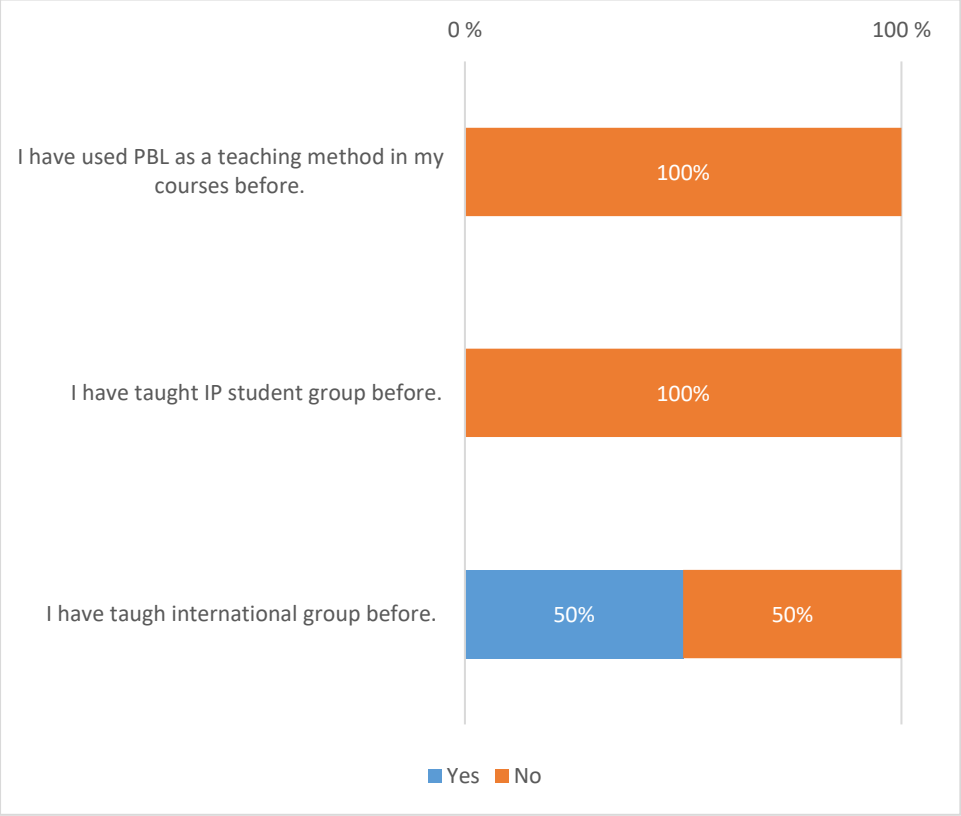


Figure 12: Teachers' background [n = 2]

3.2 Questions related to teaching, problem-based learning

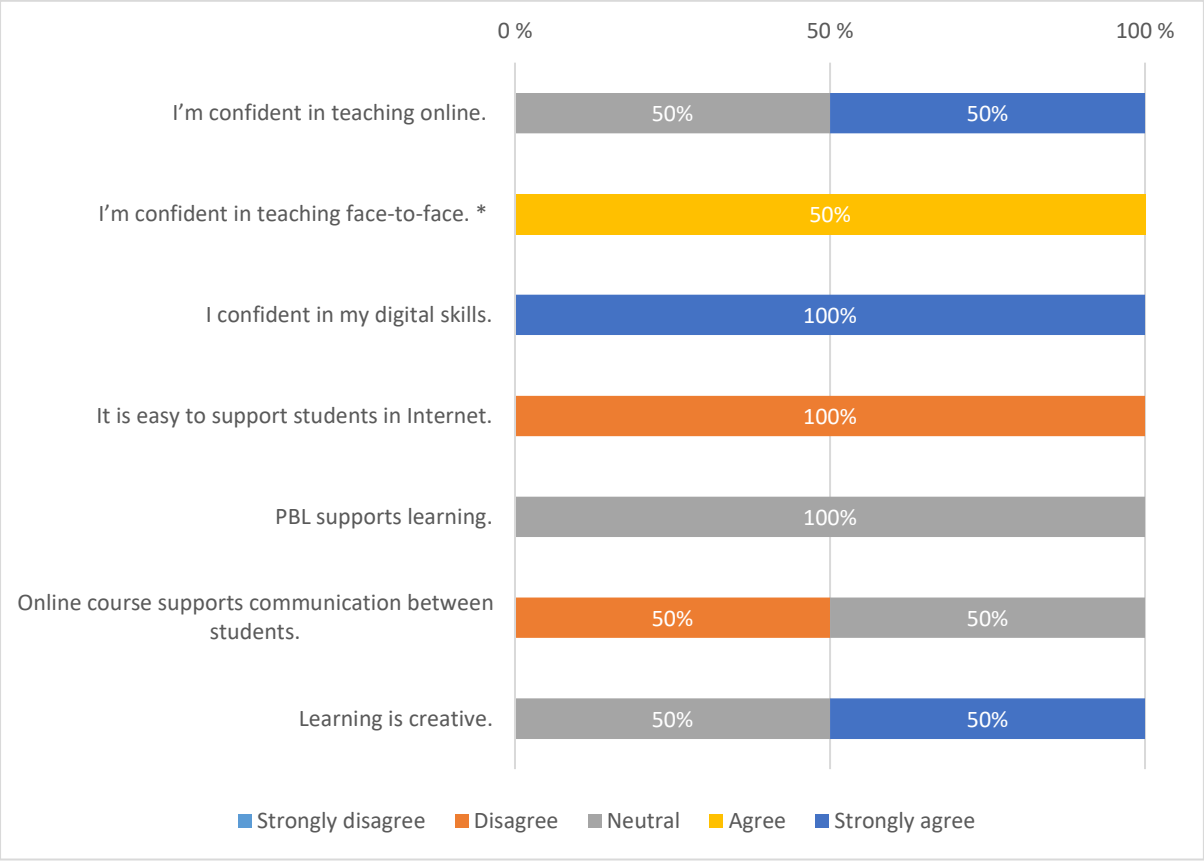


Figure 13: Questions related to teaching and problem-based learning [n=2] (* n= 1)

The ways to take accessibility into account in teaching materials? (n=2)

- I think accessibility is key for students. Teaching materials should be easy to find, access and share.
- I load material to Moodle, use material that are available to everyone

The ways to support students student-centred curriculum and flexible learning pathways?

- We try to communicate with students throughout the course, especially during the self-learning phase.
- Students can decide If possible

3.3 Questions related to inter-professional (IP) and inter-professional education (IPE)

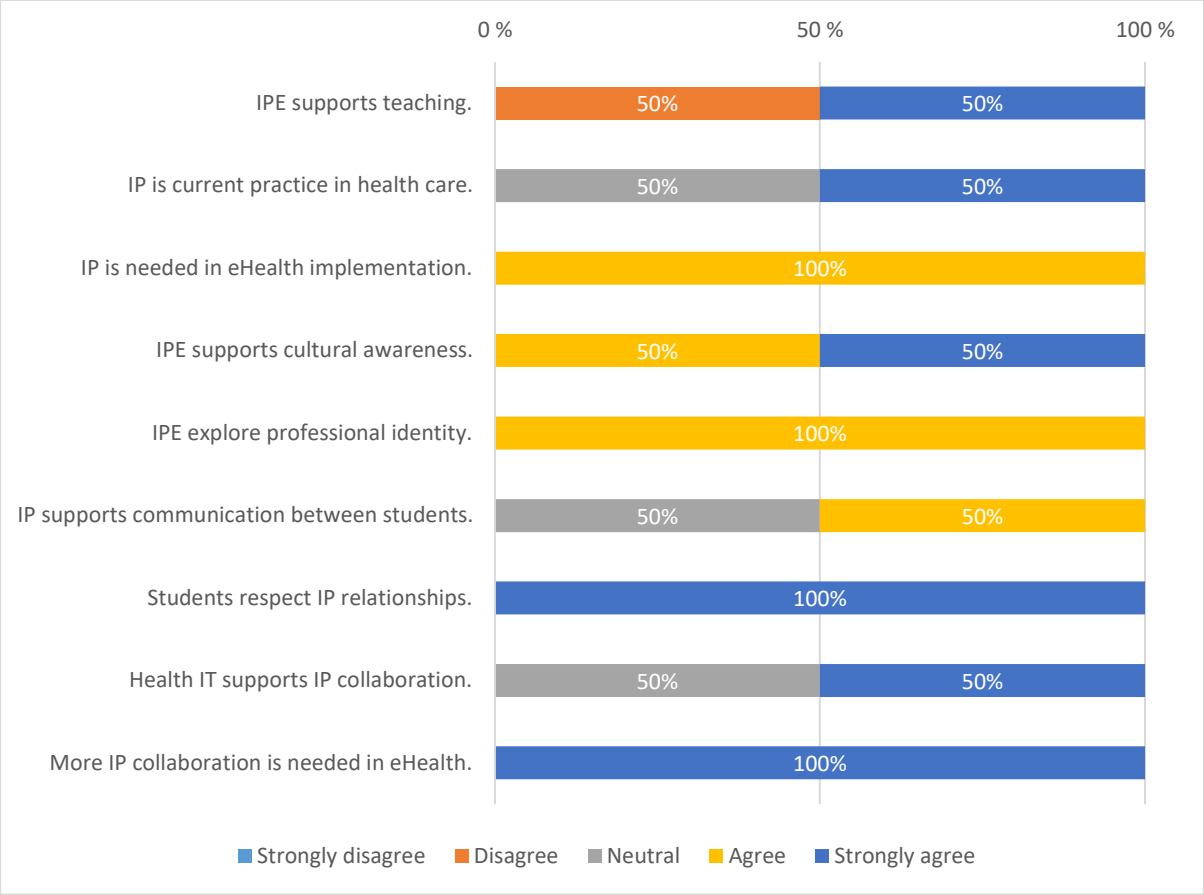


Figure 14: Questions about Inter-Professional (IP) and inter-professional education (IPE) [n=2]

Opinions about IPE (n=2)

- IPE is the key challenge and of major importance
- Interesting and necessary. On work life different professions has to Works together.

4 Common

4.1 Questions related to eHealth, an active citizen, the future

IT= Information technology

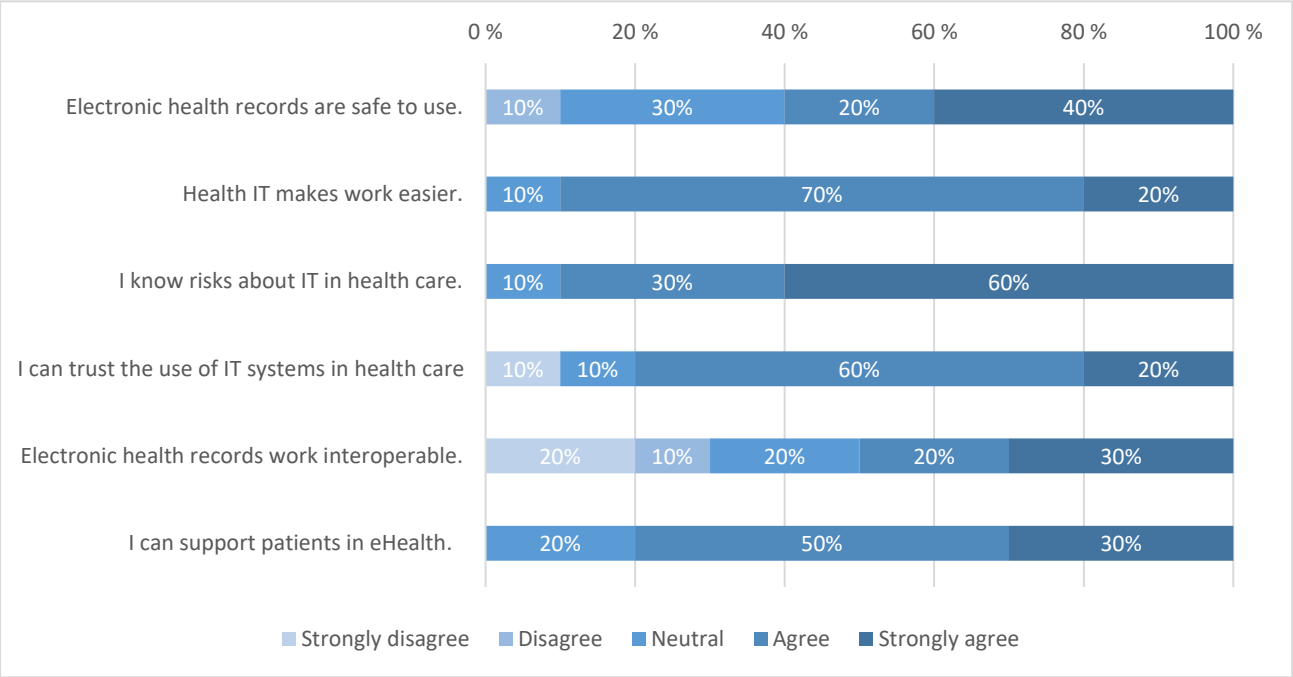


Figure 15: Questions related to eHealth, and the future [n=10]

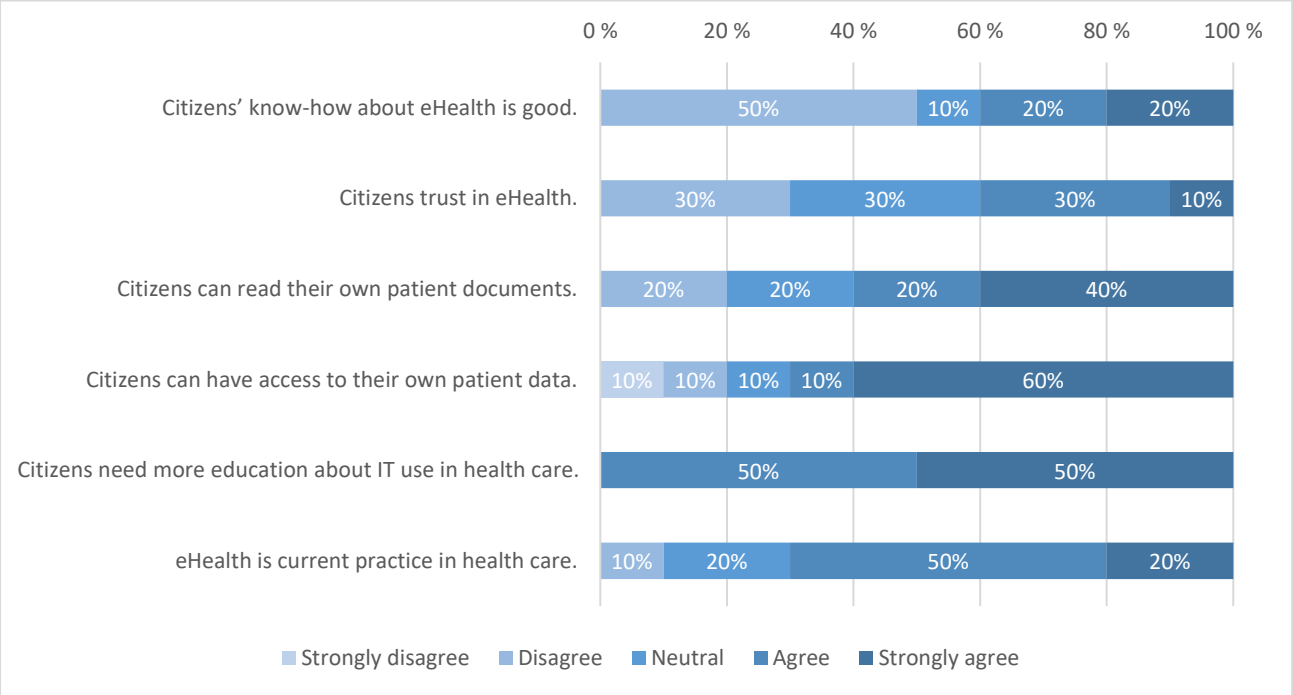


Figure 16: Questions related to eHealth, an active citizen, the future [n=10]

The possible pros and cons in eHealth practice (n=8)

Cons:
- Cost-benefit in misbalance
- The regulations are not fully created
- Lack of adequate awareness of the value of e-health in the development of health services
- Absence of a clear vision to provide health care services.
- Data compromises and hacking
- Cyberattacks
- The vulnerabilities associated to the exchange of data between different systems, The risks of misunderstanding the data when not using standards or in using them not properly
- Technical failures

Pros:
- Standardization
- Time reduction in pipe-line patient - treatment
- Independence from location (worldwide patient info usable)
- Ability of health professionals to access data of a new patient which guides their practice.
- Increase efficiency in health care, enhancing quality of care, e-health interventions should be evidence-based and empowerment
- The opportunity to analyse big data and do better health policies
- Increase the quality of healthcare provided because of the faster way to have access to many sources of our health data
- User-friendly, and easy access to information
- Strength own responsibility by sharing information with clinicians.

The value of eHealth to you (n=9)
- Time reduction and therefore cost reduction
- Actively use eHealth services both services provided by public and private providers.
- It allows us to improve the quality of treatment and broaden access to medical care
- Can help to reduce pressures on public healthcare budgets
- It is of great value for patients, health professionals, policymakers, and society
- When applied correctly following guidelines, good models and standards can improve the delivery of healthcare, improving results, saving lives and help have better research
- Empowerment of patients by providing his and her own personal health information.
- IT has a lot of potential.
- Enhance health approaches
- An unavoidable theme nowadays

4.2 Questions related to Erasmus+ programme

Learning

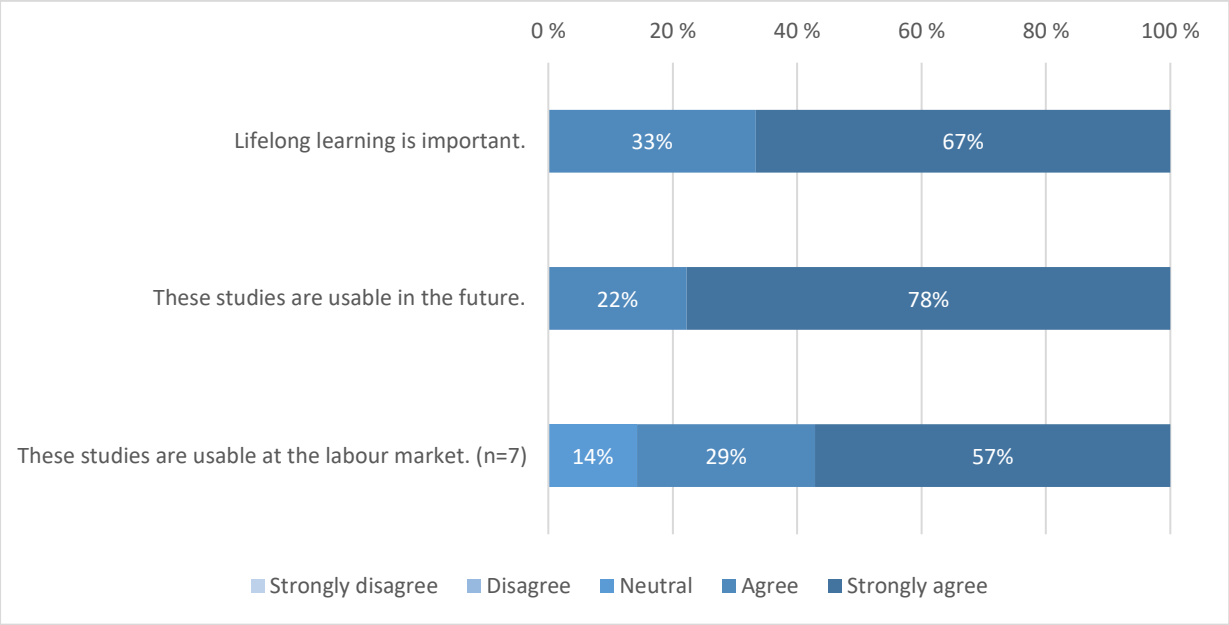


Figure 17: Questions about learning [n = 9]

eHealth

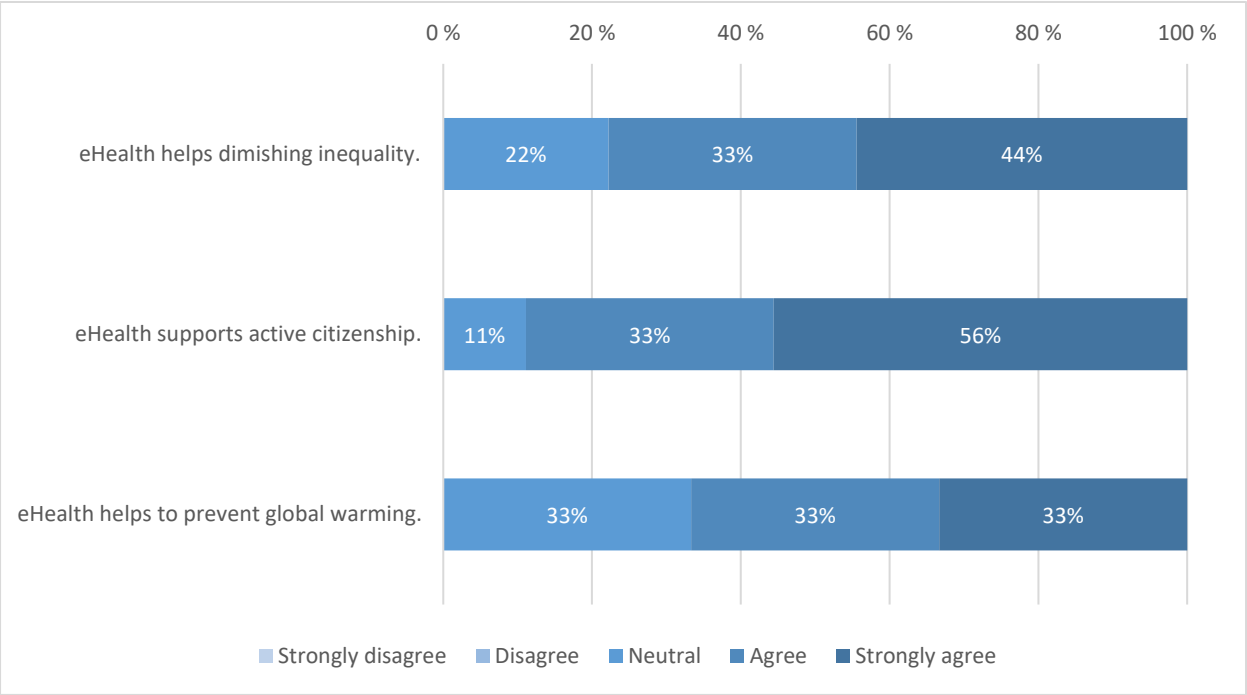


Figure 18: Questions about eHealth [n = 9]

Policy

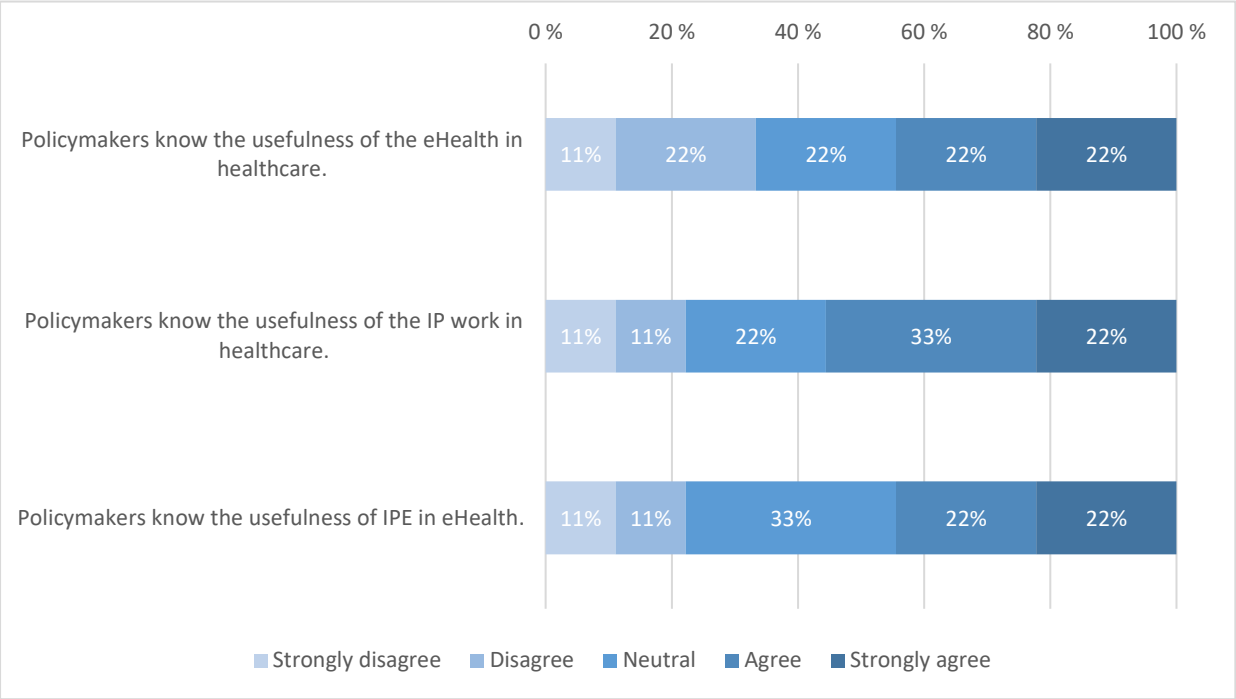


Figure 19: Questions about policy [n = 9]

Here is space for comments (n=3) (students)

- Good platform, excellent work, need to be preserved.
- It would be better if the duration was longer.

Opinion about eHealth4all@EU programme (n=2) (teachers)

- Thankful to be part of ehealth4all@EU.
- Hope that this will continue somehow.

QUESTIONNAIRE TO STUDENT

Dear participants,

This questionnaire is part of the evaluation of the research project eHealth4all@EU - Interprofessional European eHealth Programme in Higher Education. The aim of the evaluation is to present strengths of the research project and develop parts of it. The main themes of the project are eHealth, inter-professional education, problem-based learning. eHealth4all@EU is funded by Erasmus+ programme. Our project focuses on the themes digital support, lifelong learning, an active citizen, and the future. All these themes are included in the questionnaire.

The development proof the project will be evaluated comprehensively to check, among others, the quality of the courses offered. Your support of this evaluation will help to continuously develop the courses and thus ensure high quality academic content. Your expectations of the eHealth are also of great interest to us in order to be able to adapt the courses to the different needs in the best possible way.

You need to answer this questionnaire only once. If you study other courses in this project you don't have to answer this questionnaire again. There might be also the course specific questionnaires. We hope you will answer all questionnaires.

You will need about 10 to 15 minutes to complete the questionnaire. You will find instructions on how to complete the questionnaire. Please make sure that you do not leave out any question. If the options of a question do not seem entirely appropriate to you, please choose the one that applies best to you. There are no wrong or right answers when answering the questionnaire. What counts is your personal impression and opinion. All results of this survey will be published exclusively in anonymous form.

Your participation is voluntary and the information you provide will be treated confidentially. More information about the project can be found online at: https://www.hs-osnabrueck.de/ehealth4alleu/. Your data will be archived for 10 years.

If you have any questions, please contact: Johanna Ikonen johanna.ikonen@uef.fi

Thank you for your support!

Prof. Dr. Kaija Saranto — Local Project Lead, UEF

Adjunct Prof. Dr. Ulla-Mari Kinnunen — Deputy Project Lead, UEF

Background

Question	**Answer**				
Age	Number				
Gender	1. Female	2. Male	Prefer not to say		
Mother tongue	1. German	2. Portuguese	3. Finnish	4. English	5. Other
Education	1. nursing	2. computer science	3. medicine	4.informatics	5. allied health
	6. engineering	7. business	8. law	9.management	other
Current study level	1. Bachelor/ Master student (Applied Sciences)	2. Master student (University)	3. PhD	other	
I have studied in international groups before	1. Yes	2. No	I don't know		
I have studied in inter-professional groups before	1. Yes	2. No	I don't know		
I have studied with problem-based learning before.	1. Yes	2. No	I don't know		
Your reasons to study eHealth related issues.	Open answer.				
What are your own learning goals?	Open answer.				
I heard about the course from…	Open answer.				

Questions related to learning, problem-based learning

Please mark the appropriate answer category for each answer option

IP = Inter-Professional, IPE = Inter-Professional Education, PBL = Problem-based Learning

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I am confident in e-learning.	□	□	□	□	□
I like to study inter-professional studying.	□	□	□	□	□
I know the basic concepts of the eHealth in English.	□	□	□	□	□
It is easy to express myself in English.	□	□	□	□	□
It is easy to communicate with fellow student in online course settings.	□	□	□	□	□
An online course support communications between students.	□	□	□	□	□
PBL method supports my learning.	□	□	□	□	□
This course supports cultural awareness	□	□	□	□	□
Learning material supports my understanding.	□	□	□	□	□
Learning materials are easy to use.	□	□	□	□	□
Learning materials are accessible.	□	□	□	□	□
Study load and ECTS credit points are balanced.	□	□	□	□	□
I would recommend this course to other students and colleagues.	□	□	□	□	□
The course met my expectations?	□	□	□	□	□
Why did you choose this course?	Open answer.				
What were your expectations about these studies?	Open answer				

Questions related to inter-Professional (IP) and inter-professional education (IPE)

Please mark the appropriate answer category for each answer option

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
IP student group gives me new views.	□	□	□	□	□
IP explores professional identity	□	□	□	□	□
Health IT supports IP collaboration.	□	□	□	□	□
More IP collaboration is needed in eHealth.	□	□	□	□	□
IP is current practice in health care.	□	□	□	□	□
What is your opinion of the IPE?	Open answer.				

Questions related to eHealth, an active citizen, the future (IT = information)

Please mark the appropriate answer category for each answer option

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Electric health records are safe to use.	□	□	□	□	□
Health IT makes work easier.	□	□	□	□	□
I know risks about IT in health care.	□	□	□	□	□
I can trust the use of IT systems in health care.	□	□	□	□	□
Electric health records work interoperable.	□	□	□	□	□
I can support patients in eHealth.	□	□	□	□	□
Citizens' knowledge about eHealth is good.	□	□	□	□	□
Citizens trust in eHealth.	□	□	□	□	□
Citizens can read their own patient documents.	□	□	□	□	□
Citizens can have access on their own patient data.	□	□	□	□	□
Citizens need more education about IT use in health care.	□	□	□	□	□
eHealth is current practice in health care.	□	□	□	□	□
What are the possible pros and coins in eHealth practise?	Open answer				
What is the value of eHealth to you?	Open answer				

Questions about Erasmus+ programme

Please mark the appropriate answer category for each answer option

Question	**Strongly disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly agree (5)**
Lifelong learning is important.	□	□	□	□	□
These studies are usable in the future.	□	□	□	□	□
These studies will support me at the labour market.	□	□	□	□	□
eHealth helps diminish inequality.	□	□	□	□	□
eHealth supports active citizenship.	□	□	□	□	□
eHealth helps to prevent global warming.	□	□	□	□	□
Polity makers know the usefulness of the eHealth in healthcare	□	□	□	□	□
Polity makers know the usefulness of the IP work in healthcare	□	□	□	□	□
Polity makers know the usefulness of the IPE of the eHealth.	□	□	□	□	□
Here is space for your comments.	Open answer				

Thank you very much for your time and support!

QUESTIONNAIRE TO TEACHERS

Dear participants,

This questionnaire is part evaluation of the research project eHealth4all@EU - Interprofessional European eHealth Programme in Higher Education. Aim of the evaluation is to present strengths of the research project and develop parts of it. The main themes of the project are eHealth, inter-professional education, problem-based learning. eHealth4all@EU is funded by Erasmus+ programme. Our project focuses on the themes digital support, lifelong learning, an active citizen and future. All these themes are included in this questionnaire.

You will need about 10 to 15 minutes to complete the questionnaire. You will find instructions on how to complete the questionnaire. Please make sure that you do not leave out any question. If the options of a question do not seem entirely appropriate to you, please choose the one that applies best to you. There are no wrong or right answers when answering the questionnaire. What counts is your personal impression and opinion. All results of this survey will be published exclusively in anonymous form, so that no conclusions can be drawn about you personally. You need to answer this questionnaire only once.

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Thank you for your support!

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Adjunct Prof. Dr. Ulla-Mari Kinnunen — Deputy Project Lead, UEF

Background

IP = Inter-Professional, IPE = Inter-Professional Education, PBL = Problem-based Learning

Question	**Answer**				
My degree	1. nursing	2. computer science	3. medicine	4. informatics	5. allied health
	6. engineering	7. business	8. law	9. management	other
Years worked as a teacher.	Number				
My field/major as a teacher	Open answer				
I have used PBL as a teaching method in my courses before.	1. Yes	2. No	I don't know		
I have taught IP student group before.	1. Yes	2. No	I don't know		
I have taught international group before.	1. Yes	2. No			

Questions related to teaching, problem-based learning

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I'm confident in teaching online	□	□	□	□	□
I'm confident in teaching face-to-face.	□	□	□	□	□
I confident in my digital skills.	□	□	□	□	□
It is easy to support students in Internet.	□	□	□	□	□
PBL supports teaching.	□	□	□	□	□
Online course supports communication between students.	□	□	□	□	□
Learning is creative.	□	□	□	□	□
How do you take accessibility in your teaching materials?	Open answer.				
How do you support students student-centred curriculum and flexible learning pathways?	Open answer.				
Your opinion about PBL.	Open answer.				

Questions about Inter-Professional (IP) and inter-professional education (IPE)

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
IPE supports teaching.	□	□	□	□	□
IP is current practice in health care.	□	□	□	□	□
IP is needed in eHealth implementation.	□	□	□	□	□
IPE supports cultural awareness.	□	□	□	□	□
IPE explore professional identity.	□	□	□	□	□
IP supports communication between students.	□	□	□	□	□
Students respect IP relationships.	□	□	□	□	□
Health IT supports IP collaboration.	□	□	□	□	□
More IP collaboration is needed in eHealth.	□	□	□	□	□
Your opinion about IPE.	Open answer.				

Questions about eHealth, an active citizen, the future (IT = information)

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Electric health records are safe to use.	□	□	□	□	□
Health IT makes work easier.	□	□	□	□	□
I know risks about IT in health care.	□	□	□	□	□
I can trust the use of IT systems in health care.	□	□	□	□	□
Electric health records work interoperable.	□	□	□	□	□
I can support patient for eHealth.	□	□	□	□	□
Citizens' knowledge about eHealth is good.	□	□	□	□	□
Citizens trust in eHealth.	□	□	□	□	□
Citizens can read their own patient documents.	□	□	□	□	□
Citizens can have access on their own patient data.	□	□	□	□	□
Citizens need more education about IT use in health care.	□	□	□	□	□
eHealth is current practice in health care.	□	□	□	□	□
What are the possible pros and coins in eHealth practise?	Open answer				
What is the value of eHealth to you?	Open answer				

Questions about Erasmus+ program

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Lifelong learning is important.	□	□	□	□	□
eHealth studies are usable in the future.	□	□	□	□	□
eHealth helps diminish inequality.	□	□	□	□	□
eHealth supports active citizenship.	□	□	□	□	□
eHealth helps to prevent global warming.	□	□	□	□	□
Polity makers know the usefulness of the eHealth in healthcare	□	□	□	□	□
Polity makers know the usefulness of the IP work in healthcare	□	□	□	□	□
Polity makers know the usefulness of the IPE of the eHealth.	□	□	□	□	□
Your opinion about eHealth4all@Eu programme	Open answer.				

Thank you very much for your time and support!

Evaluation

Evaluation of the summer school

Authors: Johanna Ikonen, Tiina Jokinen, Ulla-Mari Kinnunen, Kaija Saranto

University of Eastern Finland

Co-funded by the Erasmus+ Programme of the European Union

Table of contents

1 Introduction

In this paper are the results of summer school in eHealth4all@EU project. The summer school included topics of “Interoperability”, “Data protection and security” and “Data analytics”. Summer school held September 8th – 14th 2022 at University of Porto in Porto Portugal.

Previously there were three online courses with same topics and these online courses were evaluated with a survey. This survey has been reused with some additions. In summer school evaluation, the base survey was expanded with questions related to each course and the organisation of summer school. Additionally, there was open discussion that provided students an opportunity to give feedback about success of summer school. The survey and open discussion were held on September 13th, 2022.

In this paper are presented only the results. The analysis and the idea of evaluation survey are presented in evaluation report of the project.

Results of survey have been presented in chapter 2. Open discussion has summarized by Professor Birgit Babitsch from university of Osnabrück in chapter 3. The survey is an appendix.

Open answers are summarized, and some parts of responses are hidden by XX to protect respondents’ anonymity.

2 Results of survey

2.1 Background

Age

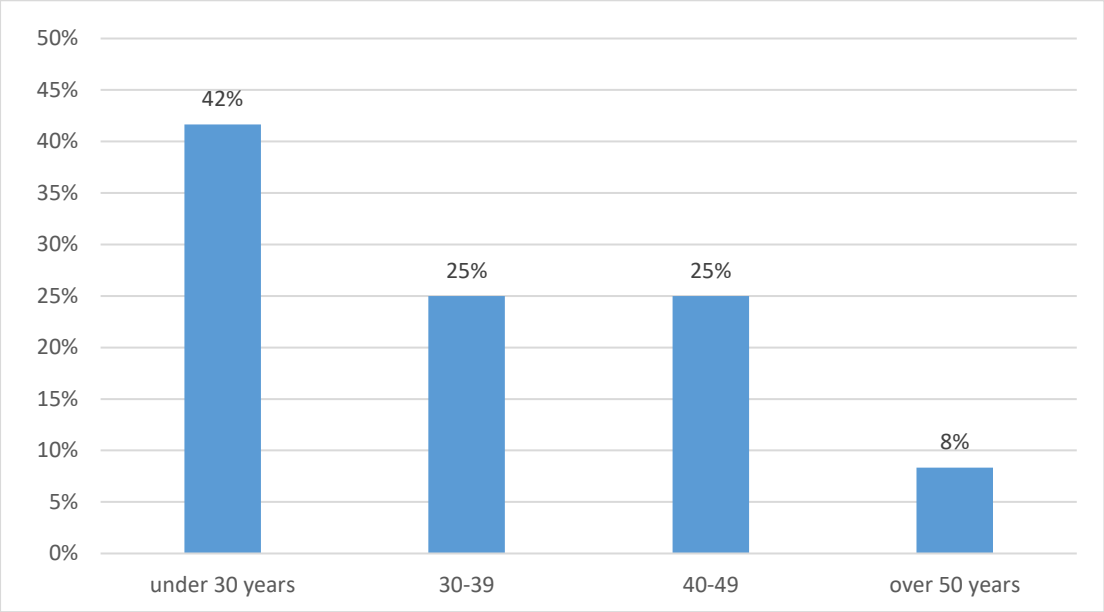

Figure 1: Age [n = 12]

Mean of age 36 years

Gender

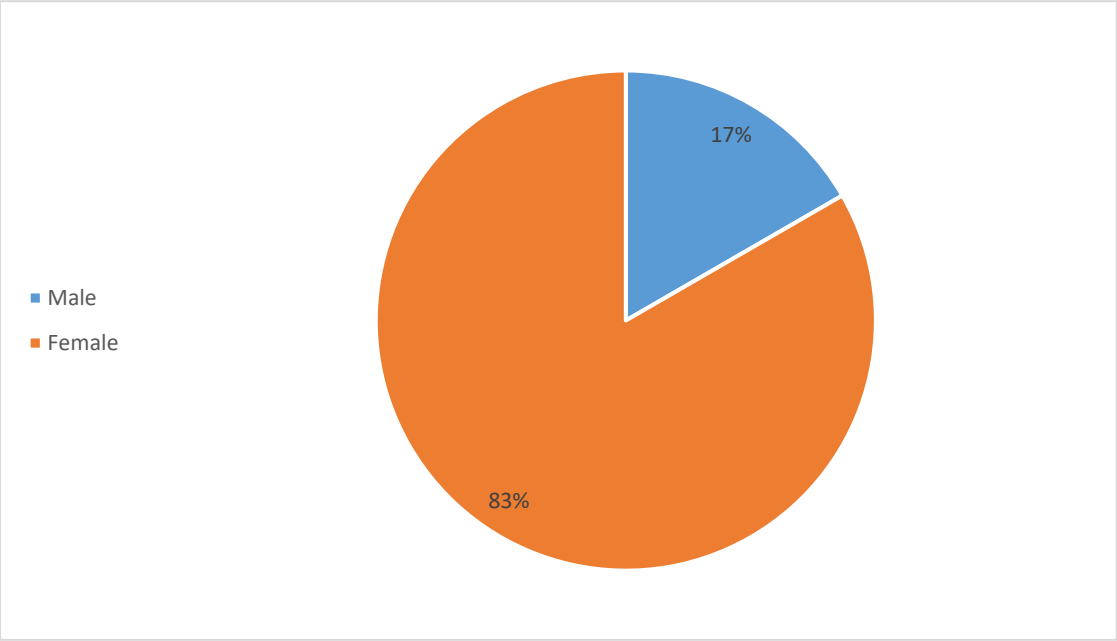

Figure 2: Gender [n = 12]

Mother Tongue

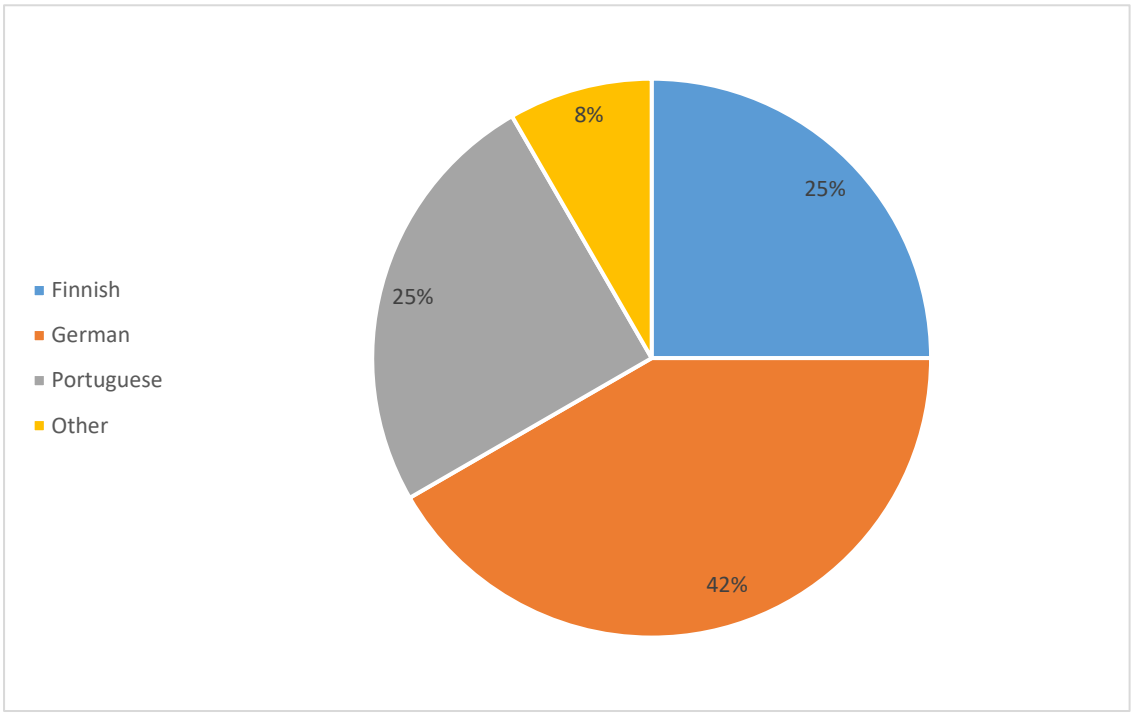

Figure 3: Mother tongue [n = 12]

Education

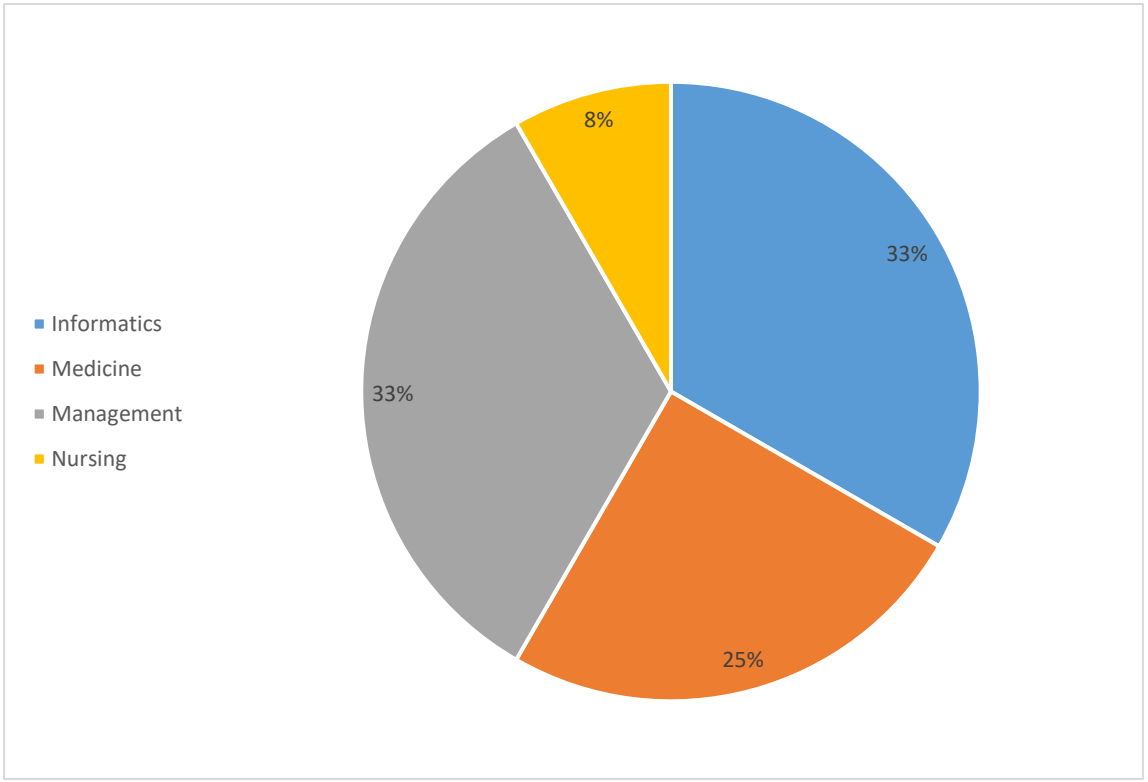

Figure 4: Education [n = 12]

Current degree level

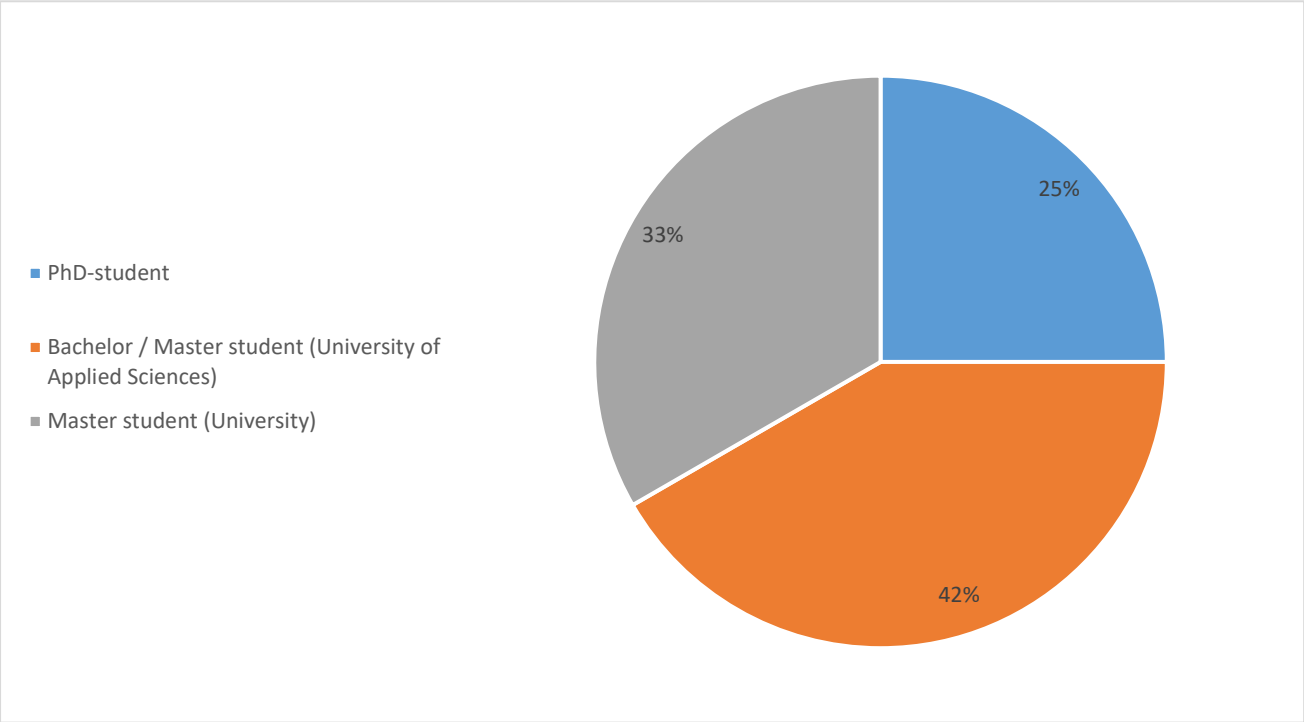

Figure 5: Current degree level [n = 12]

Questions related to background

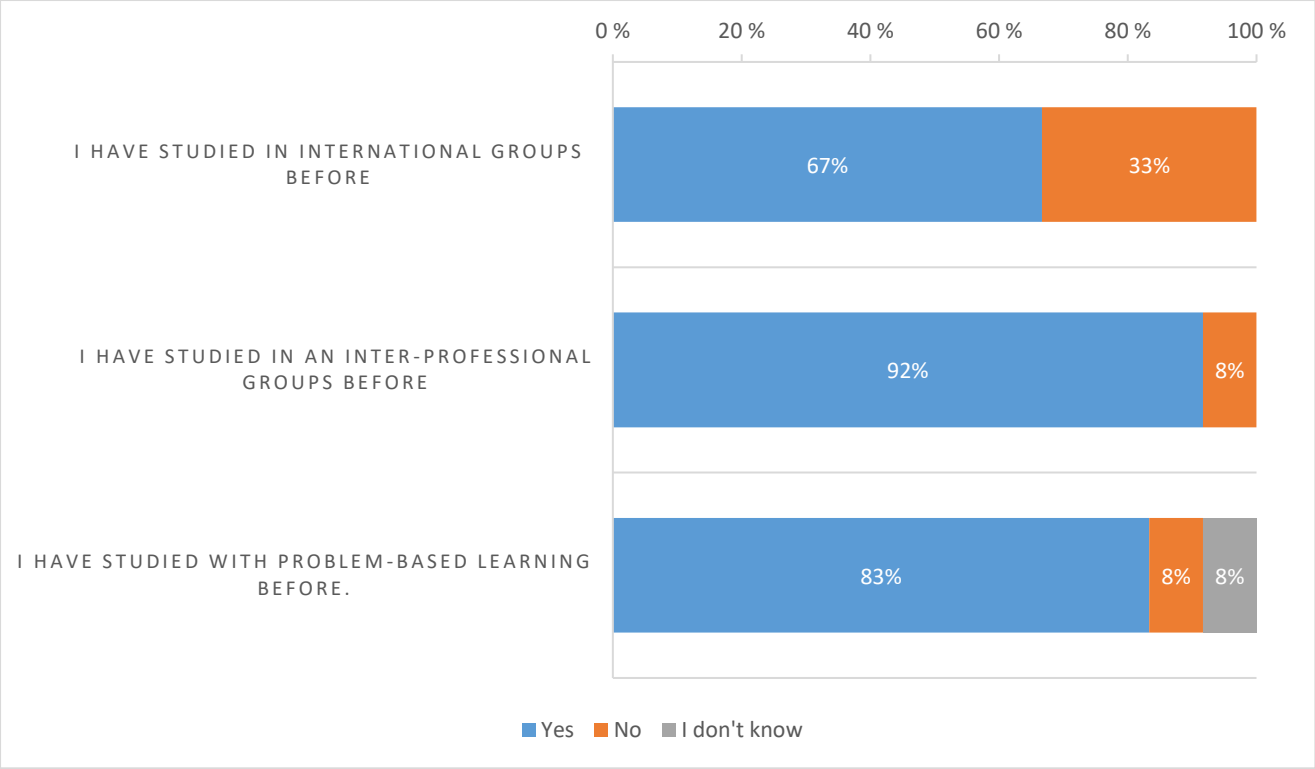

Figure 6: Question related to background [n = 12]

Participation to other summer schools previously

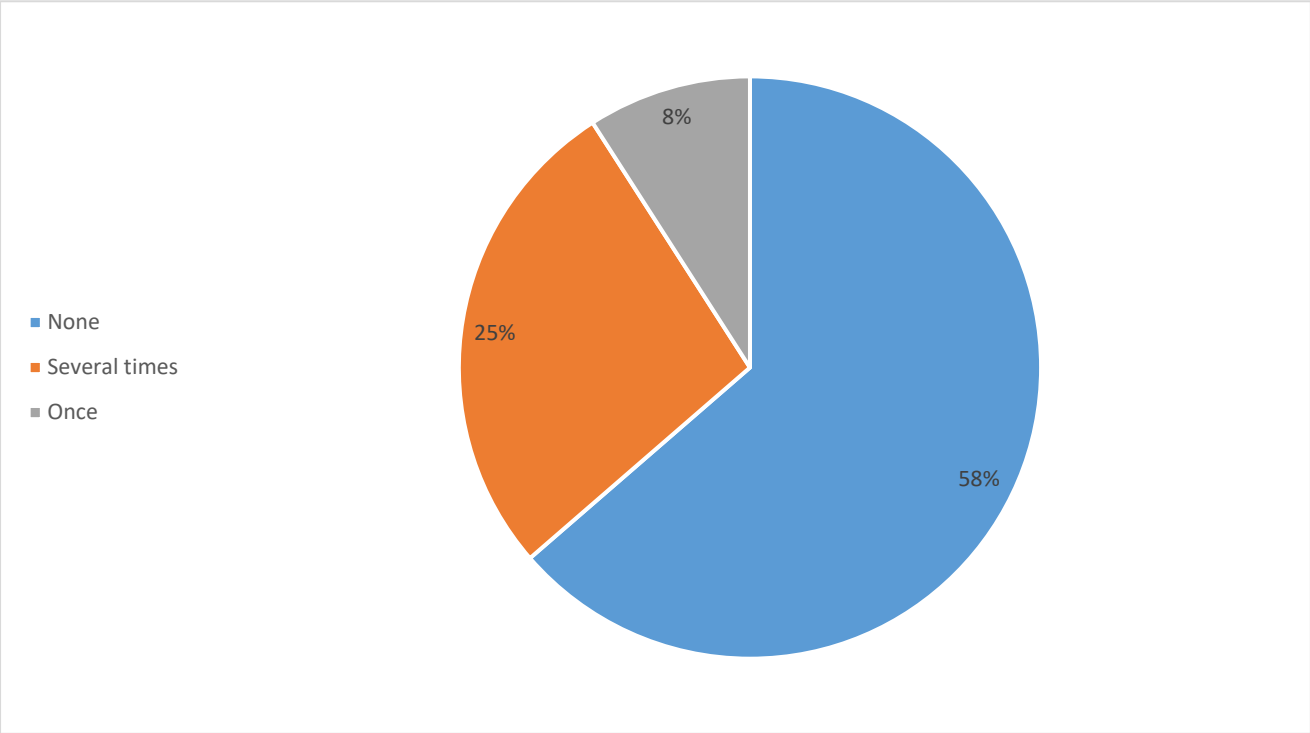

Figure 7: I have participated other summer school previously [n = 12]

Opinion about outcomes if you have participated previously (n = 4)

- Most of the time you meet interesting people and realize cultural differences that really effect the issues you deal with.
- Summer schools are a good breeding ground for these different people (and specially from different nationalities) to intermingle and tackle the proposed issues whilst learning the “ways” that people do have to figure the problems out.
- It was nice to work in a smaller group, so you know the other participants better.
- The exchange of ideas from diverse cultures can be very useful, if we are open to learn from others
- It´s always a pleasant experience.

Students about this summer school from… (n = 12)

- my university
- email

Students' seasons to study eHealth related issues (n = 12)

- Future relevant topic
- Growing topic.
- Interesting field in the Health Sector
- Studies related in the eHealth field
- Work related in the eHealth field
- To find new ways to contribute to preventive health care.
- Interesting to develop the health care systems
- Beginning of my career
- To engage and develop research in this field of eHealth
- eHealth issues are very important to learn

Students' own learning goals (n = 11)

- To get to know people
- Wanted to find new inspiration for my studies
- Wanted to learn more about the current situation and goals of the other participating countries.
- Having interesting discussions in this multi-professional and multicultural learning environment
- Take home what and how current problems might be solved
- Learn more about the topics
- Get to know international approaches to healthcare
- Improve my knowledge about digital healthcare
- Leaving my comfort zone, speaking in English
- Understanding different perspectives of different Health care professions
- Understand more about the technical part
- To contribute to the society by sharing my knowledges

2.2 Learning and problem-based learning

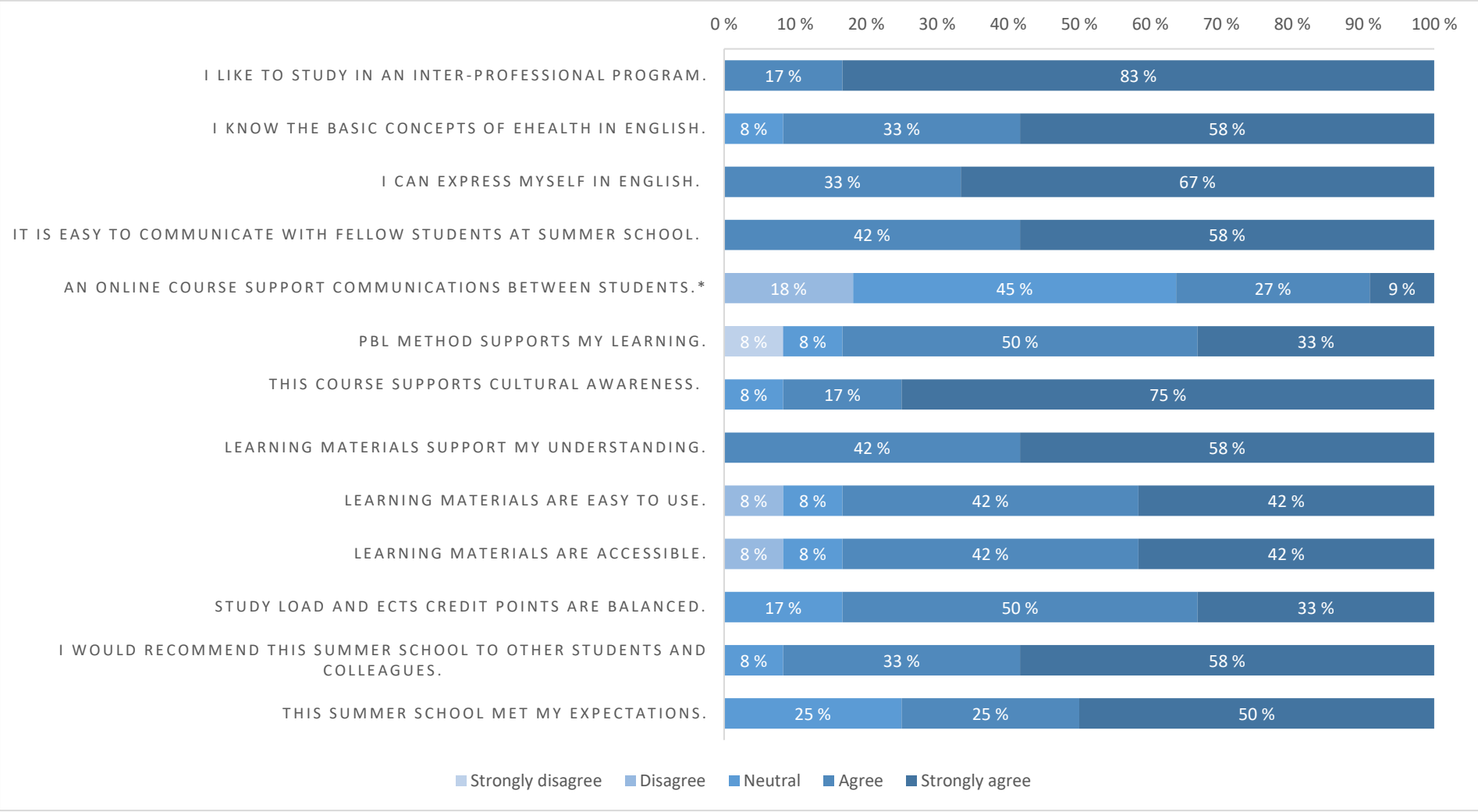

Figure 8: Question related to learning and problem-based learning [n = 12], * n = 11

Students' opinions how did the summer school fulfilled your expectations (n=12)

- I met new people dealing with same issues in different countries as I do in my own country.
- We had a chance to share our multicultural and multi-professional knowledge in a productive way while using PBL.
- I learned about some new aspects in the topics presented in the Summer School
- I hear about differences in the other health care systems
- Learned much about eHealth from different areas and views
- The courses were as described
- I enjoyed discussing things with people from different perspectives based on their professional and cultural background.
- It would be nice to have more time for sight-seeing and ongoing discussions in the private area
- The togetherness of the group was obvious from the get-go, so that was good.
- The degree to which all professors know about their subjects was astonishingly good and they were quite capable orators as well.
- The interaction between the students was very positive and I was able to get to know other realities and solutions to problems we also face in Portugal such as doubts about health data access rules and health systems implementation difficulties.
- I got new information and point of views on FHIR and logistic regression analysis.
- I practiced my English; I get to know more about the topics I was interested in
- I have learned with my peers when solving together the proposed exercises, and when presenting our results.
- I am also thankful for the fruitful discussions on the 3 main topics of this course, as well as the talks and presentations by the speakers
- After this summer schools, I realised that these subjects are related each others, because to implement Interoperability, having knowledge in data analysis is important in data processing the same as Data Protection and Security.

Questions related to learning

Figure 9: Question related to learning [n = 12]

2.3 Inter-professional (IP) and inter-professional education (IPE)

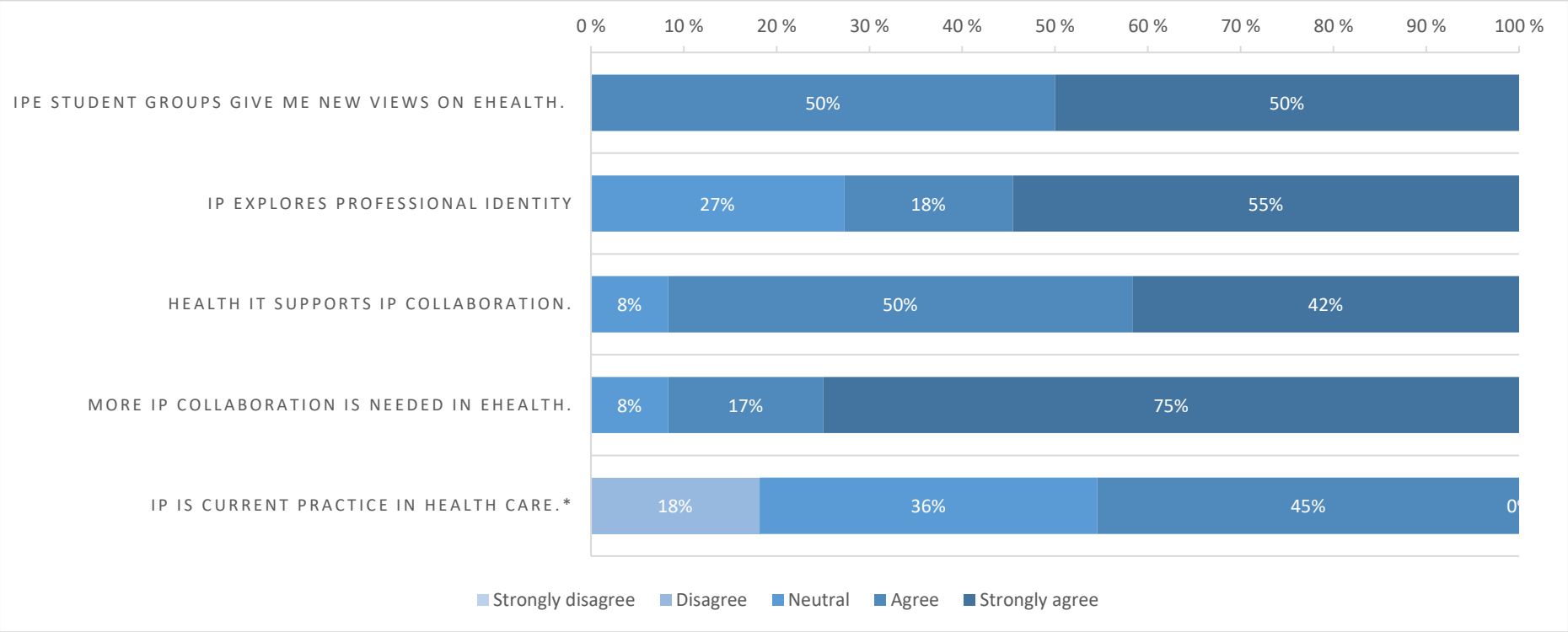

Figure 10: Inter-professiona and professional education [n =12], * n =11

Students' opinion of the IPE? (n=12)

- I'm strongly for it!
- IPE should be mandatory after the basic healthcare studies
- It is helpful to get an idea of the other perspectives and what the other professionals are dealing with.
- Since is holds a lot of potential, it should be used more in practice.
- IPE is necessary for eHealth. IT and healthcare professionals must communicate and work together in consent
- There is always a gap of knowledge between people with various professional backgrounds, but this can be quickly mended when there a supporting and quite social group, since someone's weakness may be filled with someone else's strengths.
- I think IPE is crucial to better all system levels (organizational, information systems...) in the healthcare field.
- It supports to see things also from different point of view.
- The perspectives of all stakeholders must be known, to implement a successful eHealth project
- Involving the participants and actively contribute to problem solving to reach the main goal together.

2.4 eHealth, an active citizen, and the future

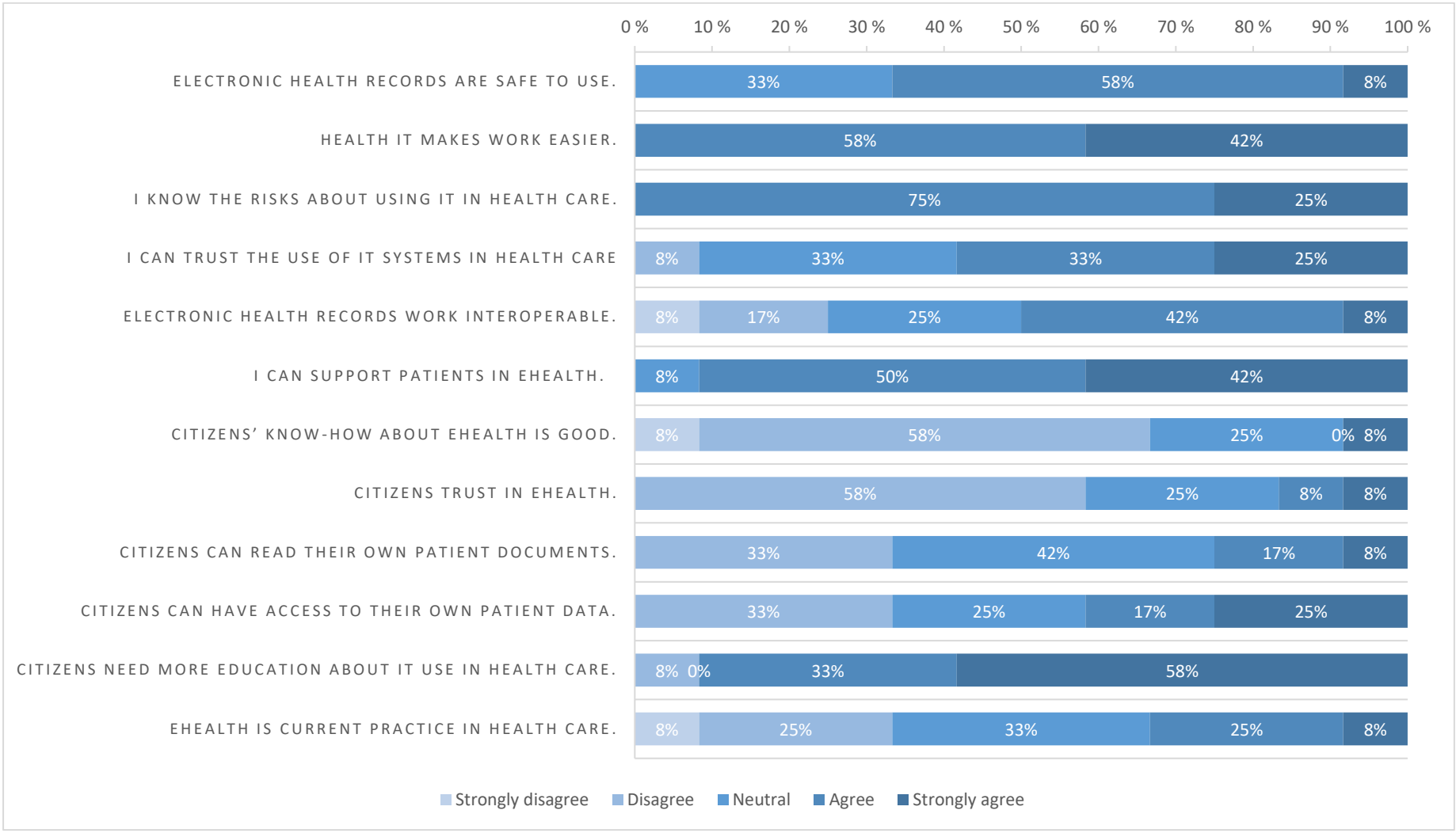

Figure 11: eHealth, an active citizen, the future [n = 12]

2.5 The module “Data Analytics”

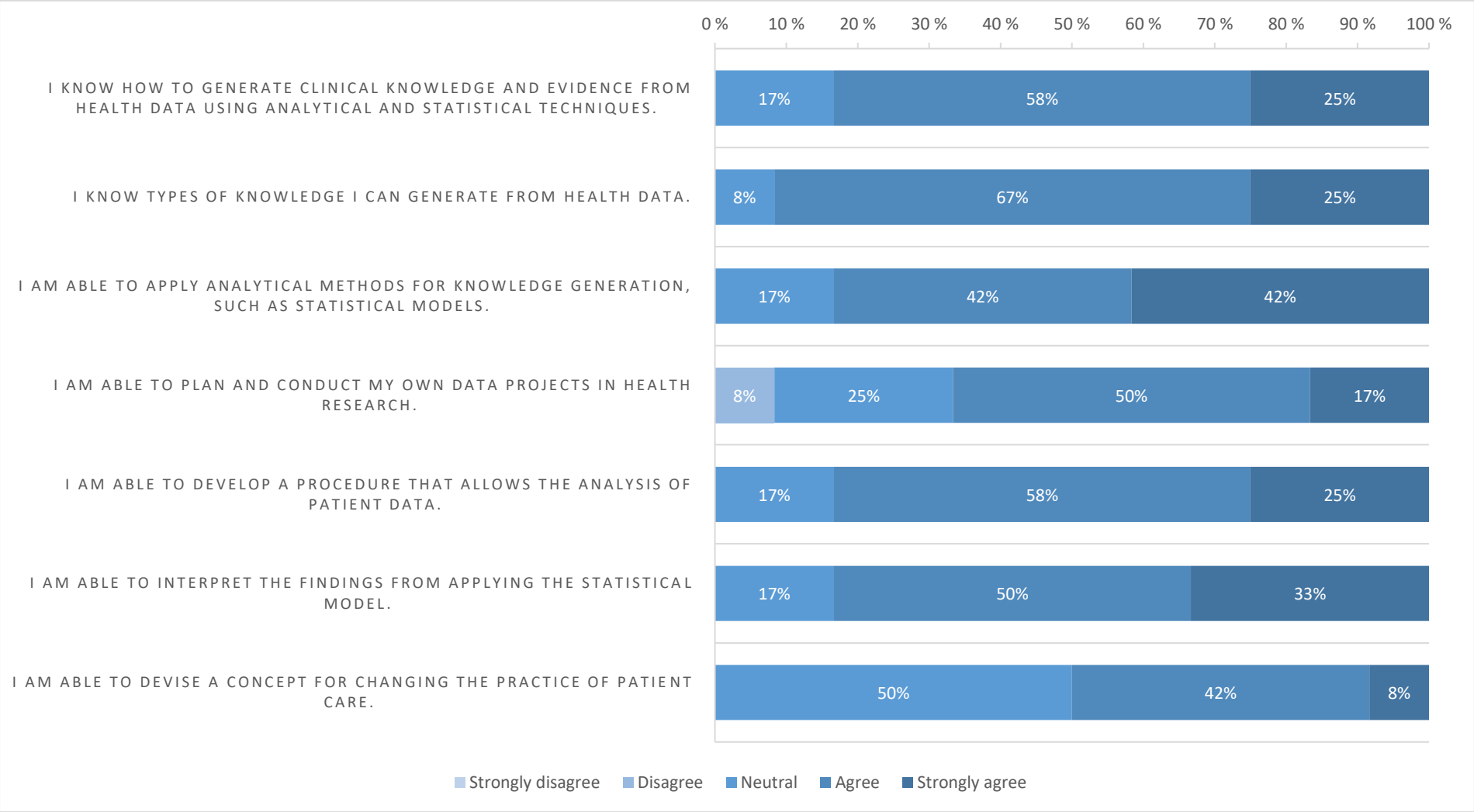

Figure 12: The module Data Analytics [n =12]

2.6 The module “Interoperability”

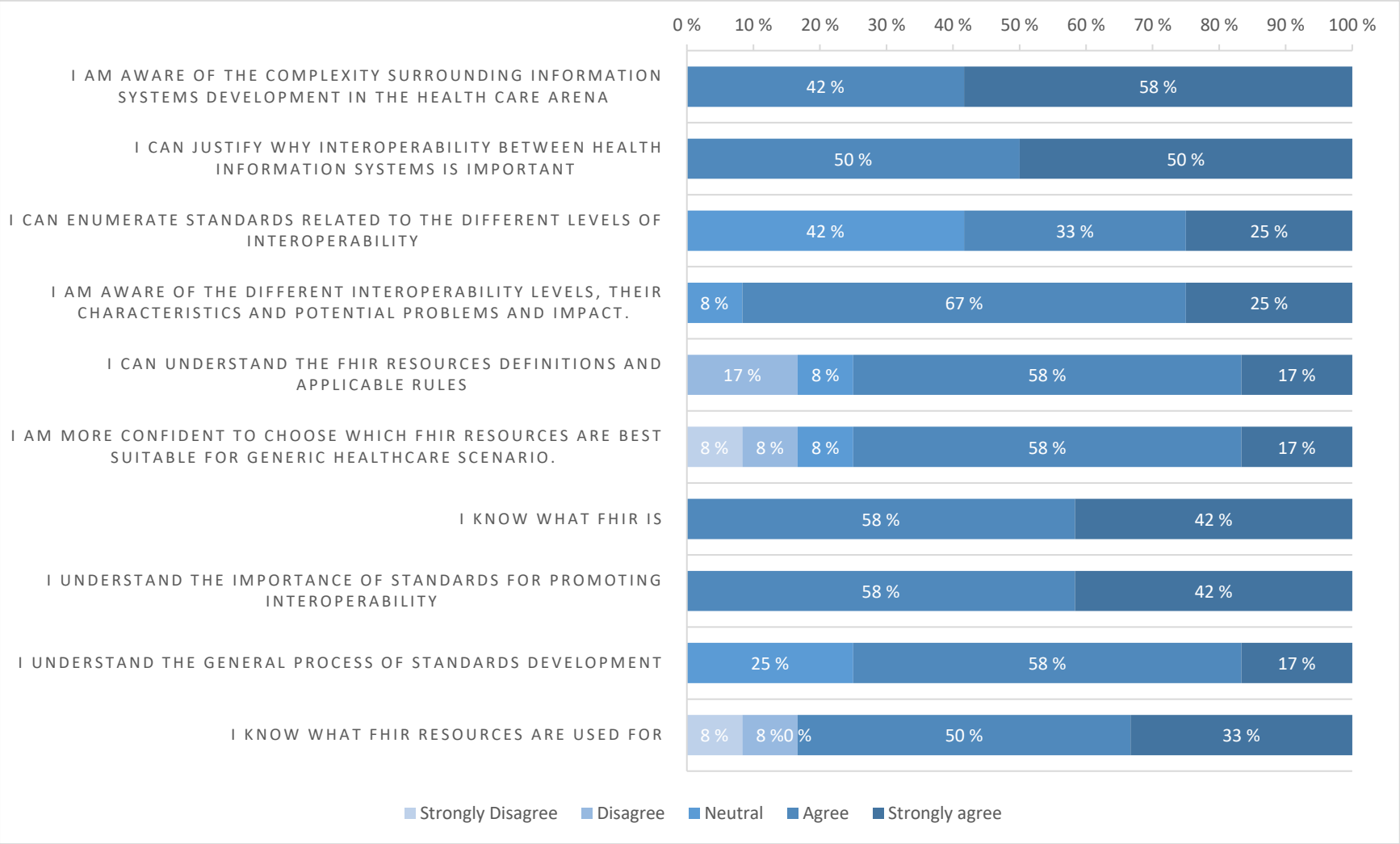

Figure 13: The module Interoperability [n = 12]

2.7 The module “Data protection and security”

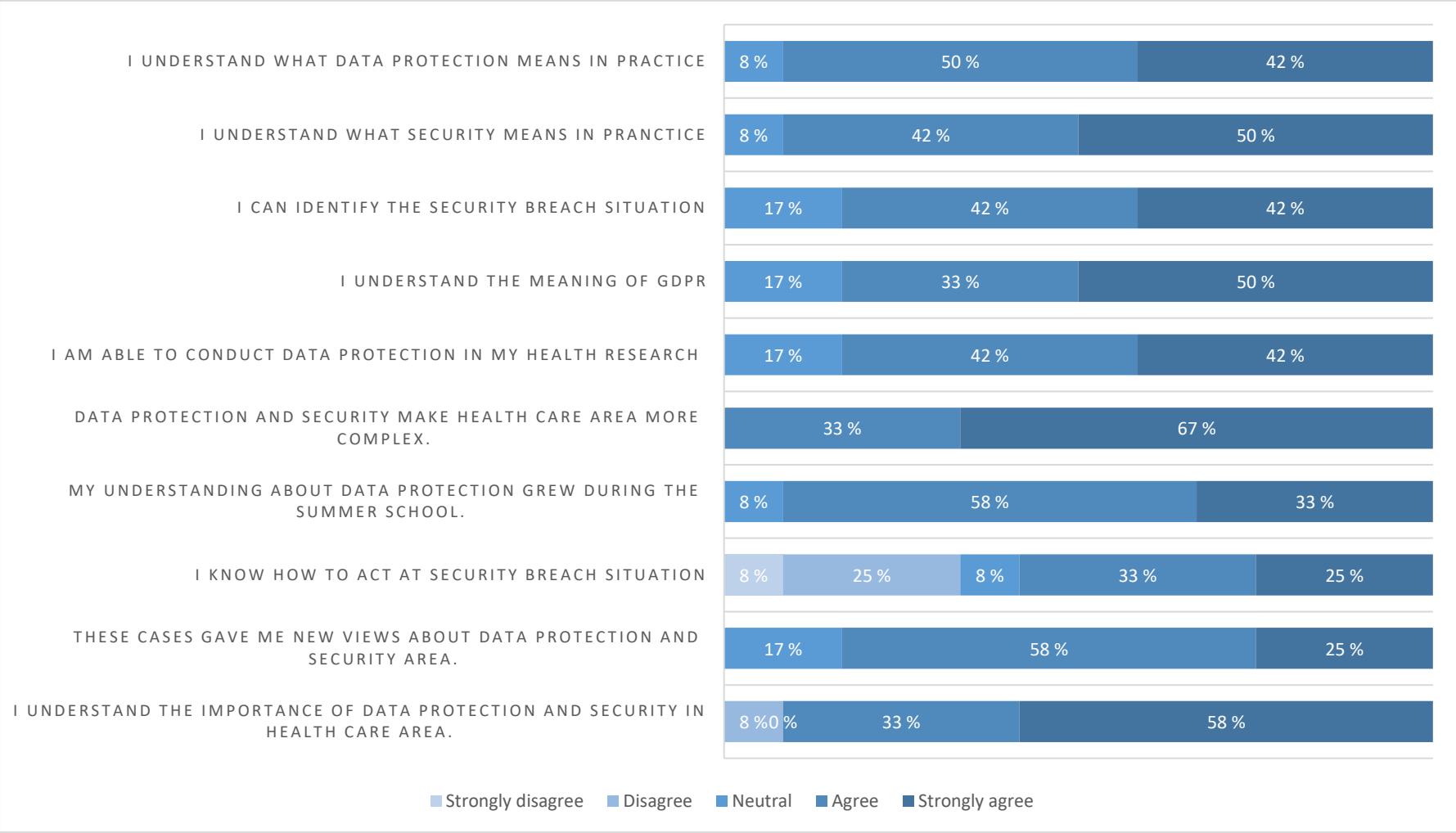

Figure 14: The module Data protection and security [n = 12]

2.8 Erasmus+ programme

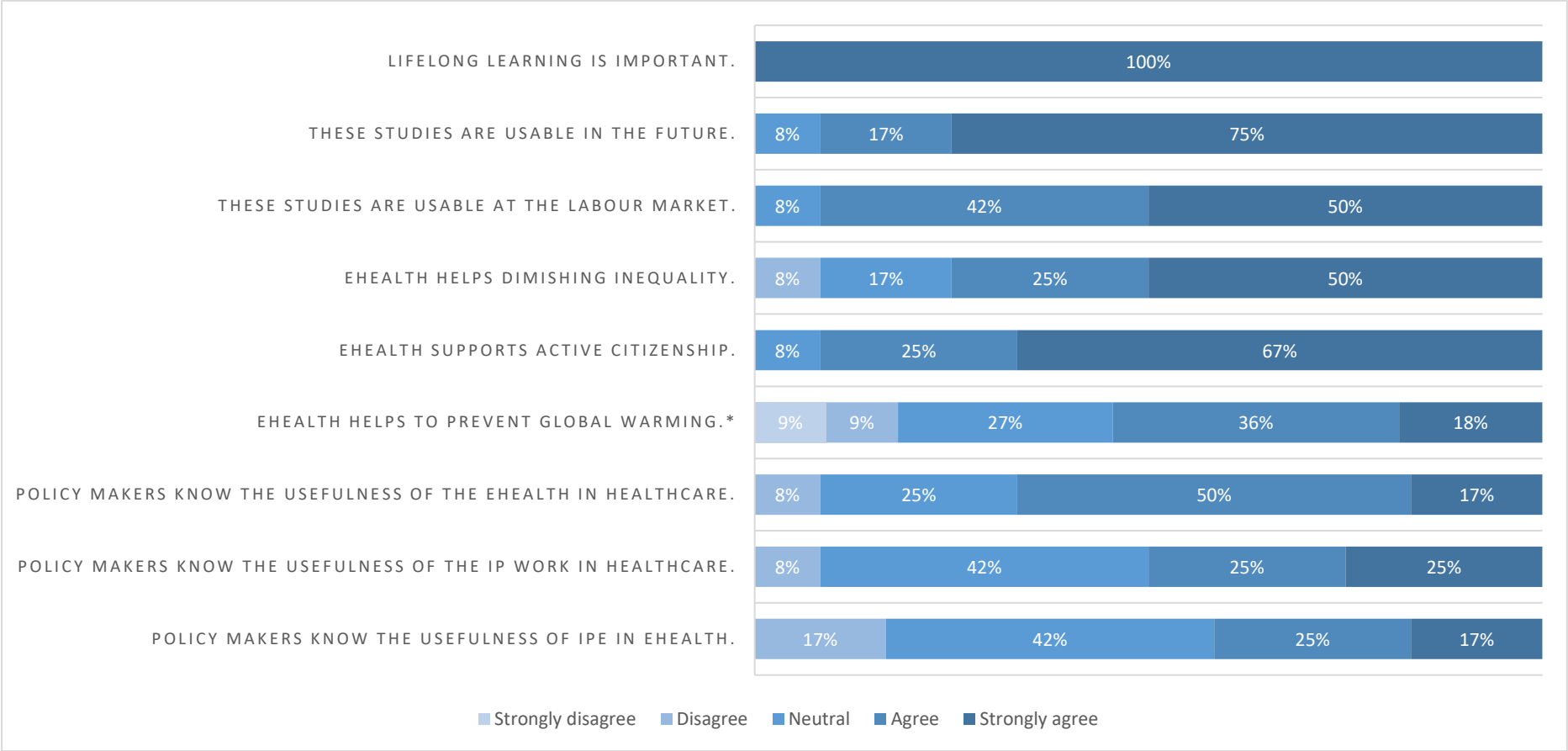

Figure 15: Erasmus+ programme [n =12], * n = 11

The possible pros and cons in eHealth practice (n=9)

Cons:

- Acceptance, knowledge from users and patients
- Threat of data breach
- Security issues
- In developing country where the health services are hardly distributed due to distances it takes time to educate the peoples into new system, and also the internet cost still expensive for the people.
- The financial aspects necessary to implement and educate the professionals and population in general as well as to assure all security, privacy and ethical aspects are considered.
- In eHealth, there's always chance that it doesn't really support equality in the society. If one can't afford to buy a phone that supports the apps, he/she won't have the same access e.g. healthcare that those whose can. it's really an issue of a society to make sure everyone has an equal access to services in need
- Lack of person-to-person contact, and this might lead to certain avoidable problems.
- eHealth is an enormous field with different innovations and new approaches every few months, we have a great problem which is we have too much to choose from and since the area is in constant update, we need to keep ourselves updated too.
- eHealth practice is complex and require the involvement of all diverse stakeholders

Pros:

- Progress in medicine, better healthcare, increase knowledge and maybe treatment successes
- Participation of patients
- The ability to use these tools to better healthcare, reduce costs and social/environmental impact and improve quality of life in general.
- Information availability
- More equality in healthcare access, and improving the quality of care, Reduce healthcare cost.
- It helps collecting and saving more data to learn and do research, to get to a better health care standard.
- It can improve the exchange between health care professionals and support patients with their health literacy
- in general eHealth does bring solutions to some of the problems found in the health space, mainly reliability, interoperability and efficiency.

Value of eHealth to you (n=10)

- I value eHealth. I use it probably few times a month at least.
- Would need to be taught more - then the value will increase
- The more I knew about it the greater the meaning for me
- eHealth means predictable, supportive medicine.
- Increase of quality of care
- It employs me
- For me eHealth is the key to provide the tools to be able to continue to improve healthcare in an increasingly difficult and demanding world.
- As information and knowledge grows, as well as the complexity of the challenges we face, eHealth may help us find solutions that keep up with this.
- Easier to use health services.
- It's the future
- A better healthcare services for all of population, more equality, and improving the quality of life.

2.9 Quality of the organisation of the summer school

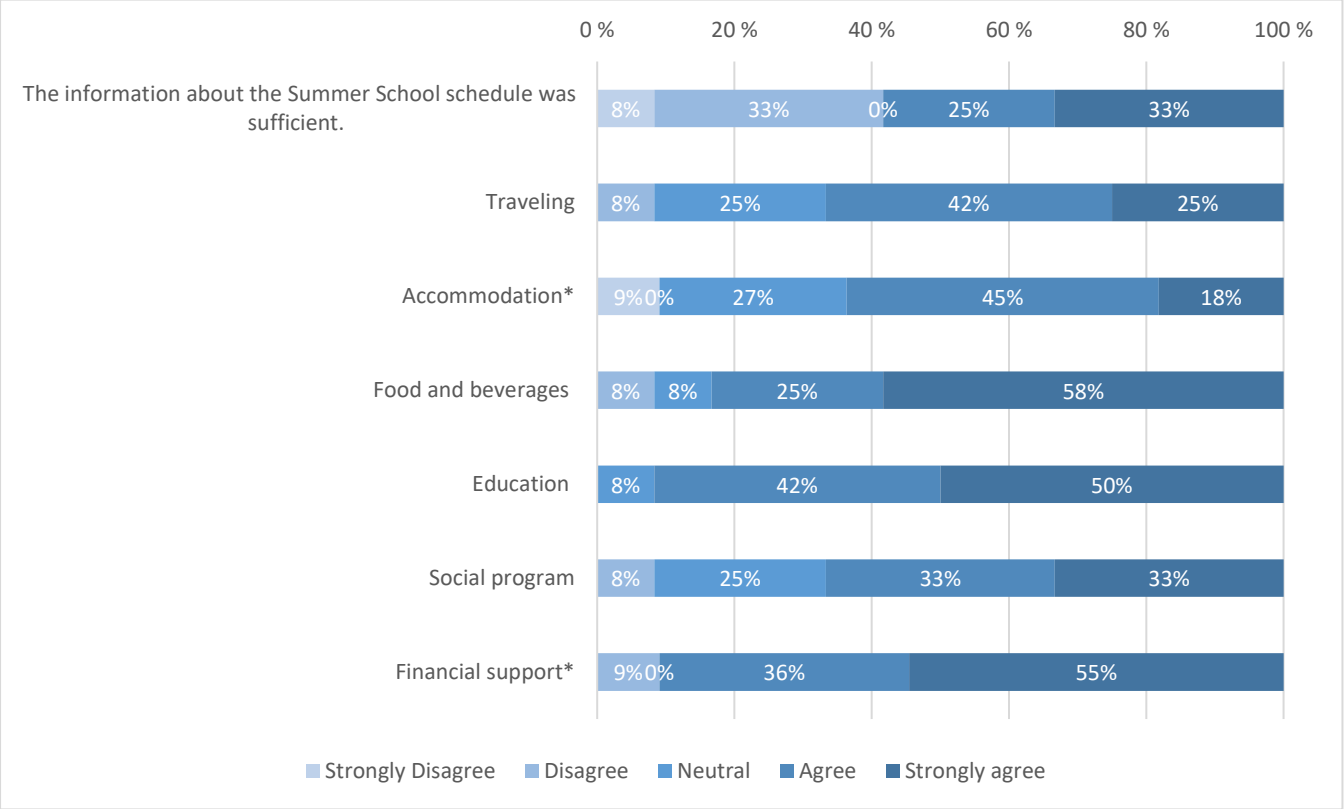

Figure 16: Quality of the orgasation of the summer school [n = 12]. * n = 11

Comments (n=11)

Positive:

- This was a very pleasant experience and made many new connections!
- The course gave me inspiration and motivation to continue with my work back at home.
- I felt very welcomed, save. Thank you!
- I enjoyed the week and would recommend to participate a summer school like this.
- Thank you for this wonderful Summer School, I think it was particularly important for people that are from a medical/healthcare background and are getting their first few swims in the technological/informatics side of it.
- Thank you for your knowledge and experiences. I would like to have had more time to interact with the students and Professors outside the class setting but the time we had was already very positive.
- Option to take part from zoom - but discussions where hard to follow because of the sound quality.
- printed time schedule and food tips.
- I am very grateful to be able to participated in this program
- You took great care of us and the social and touristic programm was great too!

Negative:

- It would be helpful to get the informations a bit earlier (adress of the teaching spot and a schedule at least 4 Weeks before the summerschool).
- More free time for activities in Porto (maybe earlier start time) ,
- Earlier information about general procedure and financial support
- I think more students would have participated if the information about the program, traveling and financial support would have been given earlier and more transparent.
- It felt a bit like gambling for us, while we waited for mandatory information.
- sometimes different because of the different education levels.
- I wish I would have had exact inforamtion about the schedule and organizationl information earlier than 3 weeks befor the start of the summer school.
- Bad communication about the previous uploaded learning materials - a lot of stuff - wasn´t clear if its necessarily to work through all the stuff. also too detailed materials. If you have no basic knowledge its hard to understand the studies

- Maybe one more day and bit shorter days, so you can see more of the city.

3 Open discussion

The students (n = 12) were asked after filling out the evaluation sheet to give some feedback to the summer school. Several aspects were mentioned and are summarized under main categories.

1. Structure

a. The schedule of the summer school had a good structure. In total it seemed to be to a bit overloaded. For example, the students wished more time for the group discussion, but also for visiting the city of Porto and group activities.

b. All students appreciated the preparatory phase which allow to get familiar with the different subjects. The amount of material was regarded by the majority as sufficient; one student would have appreciated more input.

2. Content

a. The rationale of the summer school starting with interoperability and ending with data analysis was regarded as very well working. It supported the understanding of the complex thematic field. To improve the summer school, it was suggested that the interwovenness of these topics (“big picture”) will be presented in more detail in the beginning in order to facilitate the learning process.

b. Some students wished that more “real-cases” examples were integrated.

3. Cases

a. To work on different case scenarios supported the understanding of the subjects thought in the summer school.

b. The group work increased the motivation to work on each of the subjects.

c. As the groups consisted of participants with different professional and cultural backgrounds the students profited very much from the discussion. They got in contact with different views and perspectives and how these affect the need and the evaluation of data. Based on that, the students gained a very clear understanding, how important data are on the one hand, but also what requirements are to be met (e. g. clear definitions) in order to can work satisfactorily with the data.

d. The students also gained insight into the processes of group discussion and their reflected on their own role. For instance, with covering three topics, the students have to figure out, who has expertise in each of the topics. This was regarded as being demanding, but also as very instructive to learn to handle different expertise.

e. The cases by itself were rated as good.

4. General remarks

The mix of lecture and group phases worked out very well. The latter could be improved by giving more time.

b. The selection of one case for all three topics supported an integration of the different topic and allowed to make cross-connection between them.

c. The group discussions were seen as a key for the individual learning experience and success. Besides the knowledge gain intercultural and multiprofessional competences as well as competencies in self-reflection have been supported.

d. Some students mentioned that the interest in these topics has been raised and they are eager to learn more about it.

QUESTIONNAIRE FOR STUDENTS

Dear summer school participants,

This questionnaire is part of the evaluation of the research project eHealth4all@EU - Interprofessional European eHealth Programme in Higher Education. The aim of the evaluation is to present strengths of the research project and develop parts of it. The main themes of the project are eHealth, inter-professional education, problem-based learning. eHealth4all@EU is funded by Erasmus+ programme. Our project focuses on the themes digital support, lifelong learning, an active citizen, and the future. All these themes are included in the questionnaire.

The development proof the project will be evaluated comprehensively to check, among others, the quality of the courses offered. Your support of this evaluation will help to continuously develop the courses in the future and thus ensure high quality academic content. Your expectations of the eHealth are also of great interest to us in order to be able to adapt the courses to the different needs in the best possible way.

You will need about 10 to 15 minutes to complete the questionnaire. You will find instructions on how to complete the questionnaire. Please make sure that you do not leave out any question. If the options of a question do not seem entirely appropriate to you, please choose the one that applies best to you. There are no wrong or right answers when answering the questionnaire. What counts is your personal impression and opinion. All results of this survey will be published exclusively in anonymous form.

Your participation is voluntary and the information you provide will be treated confidentially. More information about the project can be found online at: https://www.hs-osnabrueck.de/ehealth4alleu/.
Your data will be archived for 10 years.

If you have any questions, please contact: Johanna Ikonen johanna.ikonen@uef.fi

Thank you for your support!

Background

Question	Answer				
Age	Number				
Gender	1. Female	2. Male	3. Prefer not to say		
Mother tongue	1. German	2. Portuguese	3. Finnish	4. English	5. Other
Education	1. nursing	2. computer science	3. medicine	4.informatics	5. allied health
	6. engineering	7. business	8. law	9.management	other
Current study level	1. Bachelor/ Master student (Applied Sciences)	2. Master student (University)	3. PhD	4. other	
I have studied in international groups before	1. Yes	2. No	3. I don't know		
I have studied in an inter-professional groups before	1. Yes	2. No	3. I don't know		
I have studied with problem-based learning before.	1. Yes	2. No	3.I don't know		
I have participated in other summer schools previously.	1. None	2. Once	3. Several times		
If you have participated previously, what is your opinion about the outcomes?	Open answer.				
What are your own learning goals?	Open answer.				

I heard about the summer school from…	Open answer.
Your reasons to study eHealth related issues.	Open answer.
What are your own learning goals?	Open answer.

Questions related to learning, problem-based learning

Please mark the appropriate answer category for each answer option

IP = Inter-Professional, IPE = Inter-Professional Education, PBL = Problem-based Learning

Question	**Strongly disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly agree (5)**
I like to study in an inter-professional programme.	☐	☐	☐	☐	☐
I know the basic concepts of eHealth in English.	☐	☐	☐	☐	☐
It can express myself in English.	☐	☐	☐	☐	☐
It is easy to communicate with fellow students at summer school.	☐	☐	☐	☐	☐
An online course support communications between students.	☐	☐	☐	☐	☐
PBL method supports my learning.	☐	☐	☐	☐	☐
This course supports cultural awareness	☐	☐	☐	☐	☐

Learning material support my understanding.	☐	☐	☐	☐	☐
Learning materials are easy to use.	☐	☐	☐	☐	☐
Learning materials are accessible.	☐	☐	☐	☐	☐
Study load and ECTS credit points are balanced.	☐	☐	☐	☐	☐
I would recommend this summer school to other students and colleagues.	☐	☐	☐	☐	☐
This summer school met my expectations.	☐	☐	☐	☐	☐
How did the summer school fulfilled your expectations? Please give an example.	Open answer				

Questions related to learning

Please mark the appropriate answer category for each answer option.

Question	**Strongly disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly agree (5)**
The level of difficulty of the course was appropriate.	☐	☐	☐	☐	☐
The amount of content was appropriate.	☐	☐	☐	☐	☐
Working with case studies has contributed to a better understanding of the topics.	☐	☐	☐	☐	☐
The learning objectives of the course were clear.	☐	☐	☐	☐	☐
The learning objectives set for the course were realistic.	☐	☐	☐	☐	☐

The content of the preparation phase equipped me well for the topics of the summer school.	☐	☐	☐	☐	☐
The contents of the summer school were appropriate compared to my previous knowledge.	☐	☐	☐	☐	☐
Working in small groups has contributed to a better understanding of the topics.	☐	☐	☐	☐	☐
The relation between theory and practice was shown.	☐	☐	☐	☐	☐
My understanding of the summer school topic has evolved through participation.	☐	☐	☐	☐	☐

Questions related to inter-professional (IP) and inter-professional education (IPE)

Please mark the appropriate answer category for each answer option

Question	**Strongly disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly agree (5)**
IPE student groups give me new views on eHealth.	☐	☐	☐	☐	☐
IP explores professional identity.	☐	☐	☐	☐	☐
Health IT supports IP collaboration.	☐	☐	☐	☐	☐
More IP collaboration is needed in eHealth.	☐	☐	☐	☐	☐
IP is current practice in health care.	☐	☐	☐	☐	☐
What is your opinion of the IPE?	Open answer.				

Questions related to eHealth, an active citizen, the future (IT = information)

Please mark the appropriate answer category for each answer option

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Electronic health records are safe to use.	☐	☐	☐	☐	☐
Health IT makes work easier.	☐	☐	☐	☐	☐
I know the risks about using IT in health care.	☐	☐	☐	☐	☐
I can trust the use of IT systems in health care.	☐	☐	☐	☐	☐
Electronic health records work interoperable.	☐	☐	☐	☐	☐
I can support patients in eHealth.	☐	☐	☐	☐	☐
Citizens' know-how about eHealth is good.	☐	☐	☐	☐	☐
Citizens trust in eHealth.	☐	☐	☐	☐	☐
Citizens can read their own patient documents.	☐	☐	☐	☐	☐
Citizens can have access to their own patient data.	☐	☐	☐	☐	☐
Citizens need more education about IT use in health care.	☐	☐	☐	☐	☐
eHealth is current practice in health care.	☐	☐	☐	☐	☐

Questions about the module "Data Analytics"

Please mark the appropriate answer category for each answer option

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I know how to generate clinical knowledge and evidence from health data using analytical and statistical techniques.	☐	☐	☐	☐	☐
I know types of knowledge I can generate from health data.	☐	☐	☐	☐	☐
I am able to apply analytical methods for knowledge generation, such as statistical models.	☐	☐	☐	☐	☐
I am able to plan and conduct my own data projects in health research.	☐	☐	☐	☐	☐
I am able to develop a procedure that allows the analysis of patient data.	☐	☐	☐	☐	☐
I am able to interpret the findings from applying the statistical model.	☐	☐	☐	☐	☐
I am able to devise a concept for changing the practice of patient care.	☐	☐	☐	☐	☐

Questions about the module "Interoperability"

Please mark the appropriate answer category for each answer option

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I am aware of the complexity surrounding Information Systems development in the Health Care Arena	☐	☐	☐	☐	☐
I can justify why interoperability between Health Information Systems is Important	☐	☐	☐	☐	☐
I can enumerate standards related to the different levels of interoperability	☐	☐	☐	☐	☐
I am aware of the different interoperability levels, their characteristics and potential problems and impact.	☐	☐	☐	☐	☐
I can understand the FHIR resources definitions and applicable rules	☐	☐	☐	☐	☐
I am more confident to choose which FHIR resources are best suitable for generic healthcare scenario.	☐	☐	☐	☐	☐
I know what FHIR is	☐	☐	☐	☐	☐
I understand the importance of standards for promoting interoperability	☐	☐	☐	☐	☐
I understand the general process of standards development	☐	☐	☐	☐	☐
I know what FHIR resources are used for	☐	☐	☐	☐	☐

Questions about the module "Data protection and security"

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I understand what data protection means in practice	☐	☐	☐	☐	☐
I understand what security means in practice	☐	☐	☐	☐	☐
I can identify the security breach situation	☐	☐	☐	☐	☐
I understand the meaning of GDPR	☐	☐	☐	☐	☐
I am able to conduct data protection in my health research	☐	☐	☐	☐	☐
Data protection and security make health care area more complex.	☐	☐	☐	☐	☐
My understanding about data protection grew during the summer school.	☐	☐	☐	☐	☐
I know how to act at security breach situation	☐	☐	☐	☐	☐
These cases gave me new views about data protection and security area	☐	☐	☐	☐	☐
I understand the importance of data protection and security in health care area.	☐	☐	☐	☐	☐

Questions about Erasmus+ programme

Please mark the appropriate answer category for each answer option

Question	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
General attitude towards eHealth and lifelong learning					
Lifelong learning is important.	☐	☐	☐	☐	☐
These studies are usable in the future.	☐	☐	☐	☐	☐
These studies will support me at the labour market.	☐	☐	☐	☐	☐
eHealth helps diminish inequality.	☐	☐	☐	☐	☐
eHealth supports active citizenship.	☐	☐	☐	☐	☐
eHealth helps to prevent global warming.	☐	☐	☐	☐	☐
Policy makers know the usefulness of the eHealth in healthcare	☐	☐	☐	☐	☐
Policy makers know the usefulness of the IP work in healthcare	☐	☐	☐	☐	☐
Policy makers know the usefulness of the IPE of the eHealth.	☐	☐	☐	☐	☐
What are the possible pros and cons in eHealth practise?	Open answer				
What is the value of eHealth to you?	Open answer				

Quality of the organisation of the Summer School					
Summer school arrangements were good	☐	☐	☐	☐	☐
The information about the Summer School schedule was sufficient.	☐	☐	☐	☐	☐
Traveling	☐	☐	☐	☐	☐
Accommodation	☐	☐	☐	☐	☐
Food and beverages	☐	☐	☐	☐	☐
Education	☐	☐	☐	☐	☐
Social program	☐	☐	☐	☐	☐
Financial support	☐	☐	☐	☐	☐
Please feel free to comment anything you like.	Open answer				

Thank you very much for your time and support!

HOCHSCHULE OSNABRÜCK
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GESUNDHEITSCAMPUS OSNABRÜCK
Gesundheitsversorgung neu gestalten

U.PORTO

UNIVERSITY OF EASTERN FINLAND

Evaluation

IO6: Evaluation Report

Authors: Johanna Ikonen, Tiina Haukkakallio, Ulla-Mari Kinnunen, Kaija Saranto
University of Eastern Finland

Co-funded by the Erasmus+ Programme of the European Union

Table of contents

1 Introduction

This is a report of the evaluation (IO6) of the Interprofessional European eHealth Programme in Higher Education (eHealth4all@EU) project. Universities and universities of applied sciences from Germany, Portugal, and Finland participated in this pan-European project. The project targeted higher education students interested in the broad topic of eHealth and teachers who are supervising related courses.

During the project, the above-mentioned universities organized three courses for higher education students related to different topics of eHealth. The curriculum consisted of online courses and summer school. Educational methods like problem-based learning and inter-professional perspectives were used in education. Courses were open to all higher education students who were interested in this topic. All students were studying in international groups and the project and teaching language was English.

The aim of the project was to explore eHealth education through problem-based learning methods at inter-professional perspectives. The purpose of the project was to study and evaluate the teaching methods used in the project. According to the plan, two rounds of the courses were carried out and evaluation rounds at each of the end points. Due to the Covid19 pandemic, the original plan had to be changed. This resulted in a decision to offer three online courses and three courses during a summer school session. However, these changes also impacted our plans for evaluations.

The purpose of this report is to summarize the internal evaluation of the E-learning courses and summer school. The evaluation focuses on the curriculum, learning materials, content of the courses and method quality. The aim is to present how the objectives of the project are realized and give recommendations for the future.

2 Description

The project plan of eHealth4all@EU guided this evaluation. The aim of the evaluation was to present strengths and develop parts of the project within the main evaluation themes of eHealth, inter-professional education, problem-based learning. However, the evaluation focused on the more specific themes of digital support, lifelong learning, active citizenry, and the future. Evaluation of the project was based on all these themes and revealed students' and teachers' opinions on the efficiency and quality of the learning experience.

The evaluation was conducted using surveys. The teacher survey was built around themes of teaching, problem-based learning, inter-professional education, e-learning, and materials. The student survey was related to studying, problem-based learning, inter-professional learning, e-learning, and learning materials. All respondents were asked to provide responses to the eHealth learning outcome part which was related to the future, environmental sustainability, and lifelong learning.

During the project there were three online courses including the following topics: interoperability, data protection and data security, as well as big data and analytics. At the end of each online course students and teachers responded to their separate surveys. Online links to Microsoft Form surveys were sent to respondents via email and the Moodle portal at the end of each course. These same topics were included also in summer school. At the end of summer school, students responded to the same based survey. Additionally, there was open discussion about feedback. Themed notes were prepared from these discussions.

One aim of the study was to compare students' and teachers' responses together and independently. The surveys' original five-point (5) Likert scale was changed to a three-point (3) scale. Analysis was presented at the three-dimension levels: students on the micro level, local on the meso level, and global view on the macro level. These dimension levels have been developed from the CAF-model (Appendix 1).

In online courses, there were also pre- and post-questionnaires given to students by teachers. All five of these surveys (surveys of the evaluation part for students and teachers, online courses' pre- and post-surveys and the summer school survey) have utilized this evaluation. In this paper, respondents' open answers are indicated by quotation marks and italics.

3 Summary

3.1 Students' responses

3.1.1 Online courses

Participants
The total number of students who started to study online courses was 63. However, some of them discontinued their studies and eight (8) students responded to survey (13 %). Respondents' mean of age was 44.5 years and most of them (63 %) were female. Half of the respondents' mother tongue was Portuguese (n=4). Half of the respondents were PhD students (n=4). Their graduate fields were medicine and engineering, but also nursing, computer science, informatics, and allied science. Most of the respondents had previous experience studying using problem-based learning methods (63 %), inter-professional groups (88 %), and international groups (75 %).

For the students, the main reason to study eHealth-related issues was their work. Respondents' main goals for these studies were to develop IT skills or gain a better understanding of eHealth. Respondents reported that eHealth will be important in the future.

> *"Because it is inter-professional and it is international, and also free."*

Learning and problem-based learning
Respondents mostly agreed that they were confident in e-learning (63 %) and inter-professional studies (76 %). Students felt that they know basic concepts in English (75 %), and they can express themselves in English (75 %). In the online course setting it was easy to communicate with fellow students (63 %) and the online courses supported communication between students (63 %). Respondents reported that problem-based learning supported their learning (88 %). They also felt that the course supported cultural awareness (51 %).

Students were content with the learning materials. The learning materials supported their understanding (86 %), they were easy to use (75 %) and were accessible (88 %).

Student workload and ECTS credit points were well balanced (63 %). Students reported they would recommend the course to other students and colleagues (88 %) and the course met their expectations (88 %).

Inter-professionality and inter-professional education
Students considered inter-professionality and inter-professional education to be important. They thought studying in an inter-professional group gave them new perspectives (88 %), inter-professionality explored professional identity (63 %), and it was a current practice in health care (63 %). Respondents' reported the opinion that more inter-professional collaboration was needed in eHealth (76 %) and that health information technology supported interprofessional collaboration (76 %).

Opinions about inter-professional education (n = 6) were positive. Inter-professional education is current, global, and an important pedagogical approach.

> *"In my opinion, it is urgent to develop inter-professional education. I believe that is the best way to identify the diverse roles in an inter-professional team and develop highly efficient interprofessional teams."*

3.1.2 Summer school

Participants
A total of twelve (12) students participated in the summer school and responded to the survey. Mean student age was 36 years. German (42 %) was the most common mother tongue. Students were studying at universities of applied sciences (42 %), universities (33 %) and some were doctoral students (25 %). Most of them were majoring in informatics, management, medicine, or nursing. Most of the respondents had previous experiences with problem-based learning methods (83 %), inter-professional groups (92 %), and international groups (67 %). A majority of students (58 %) were in summer school for the first time.

The reasons that students wanted to study eHealth-related issues were related to their studies, work, and general interest. They thought eHealth is growing topic and these studies will be increasingly important in the future. In summer school, students wanted to learn more about issues such as eHealth, other cultures, health care, technology, and practice their English.

Learning and problem-based learning
Respondents were in agreement concerning their confidence in the value of inter-professional studies (100 %). Students felt they know basic concepts in English (91 %), and they can express themselves in English (100 %). They also felt it was easy to communicate with fellow students in the summer school setting (100 %) and online course supported communication between students (36 %). Respondents reported problem-based learning supported their learning (88 %). Further, students agreed that summer school supported cultural awareness (92 %).

Students felt they know basic concepts in English (91 %), and they can express themselves in English (100 %). They also felt it was easy to communicate with fellow students in the summer school setting (100 %) and online course supported communication between students (36 %). Respondents reported problem-based learning supported their learning (88 %). Further, students agreed that summer school supported cultural awareness (92 %).

Students were content with the learning materials, reporting that the learning materials supported their understanding (100 %), were easy to use (84 %) and were accessible (84 %). Student load and ECTS credit points were well-balanced (83 %). Lastly, they would recommend the course to other students and colleagues (91 %) and the course met their expectations (75 %).

Students enjoined the discussions with others in the summer school setting. They heard and learned about other health care systems, different solutions from the eHealth field and the multicultural and inter-professional environment.

Inter-professionality and inter-professional education
Students consider inter-professionality and inter-professional education to be important. They thought studying in inter-professional groups gave them new views (100 %), inter-professionality explored professional identity (73 %), and it is a current practice in health care (45 %). Respondent opinions indicated that more inter-professional collaboration is needed in eHealth (92 %) and health information technology supported inter-professional collaboration (92 %).

Opinions about inter-professional education were positive and that Inter-professional education is current, global, and an important pedagogical approach.

> *"IPE is necessary for eHealth. IT and healthcare professionals must communicate and work together in consent."*

3.2 Teachers' responses

Two (2) responses to the teacher questionnaire were received. Both teachers had used problem-based methods before and they had previously taught inter-professional student groups.

Teaching and problem-based learning
Teachers agreed that they were confident in their teaching abilities both online and face-to-face. They trusted their digital skills, but they felt that it is not easy to support students via the Internet. Both respondents agreed with the importance of accessibility.

Inter-professionality and inter-professional education (IPE)
The teacher respondents were strongly in agreement with students regarding inter-professional relationships and the need for more inter-professional collaboration in eHealth. They further agreed that inter-professionality was needed in eHealth implementation and inter-professional education helped them to explore their professional identity.

> *"In my field of informatics, IPE is the key challenge and of major importance, because it's about consensus on how data is stored and communicated."*

3.3 eHealth learning outcomes

All students and teachers (n = 22) responded to the survey's common parts related to issues like eHealth, active citizenry, the future, and parts related to the Erasmus program: lifelong learning, being an active citizen global warming, and policy.

eHealth, active citizen, and the future
Those surveyed had at least agreed about the following: the importance of electronic health record security (64 %), health IT makes work easier (96 %), they know the risks associated with IT in health care (96 %) and they can be trusted to use IT systems in health care (68 %). Further, respondents felt they could support patients in eHealth (86 %). Regarding the interoperability of electronic health records, 50 % of respondents agreed this worked and 28 % disagreed (Figure 1).

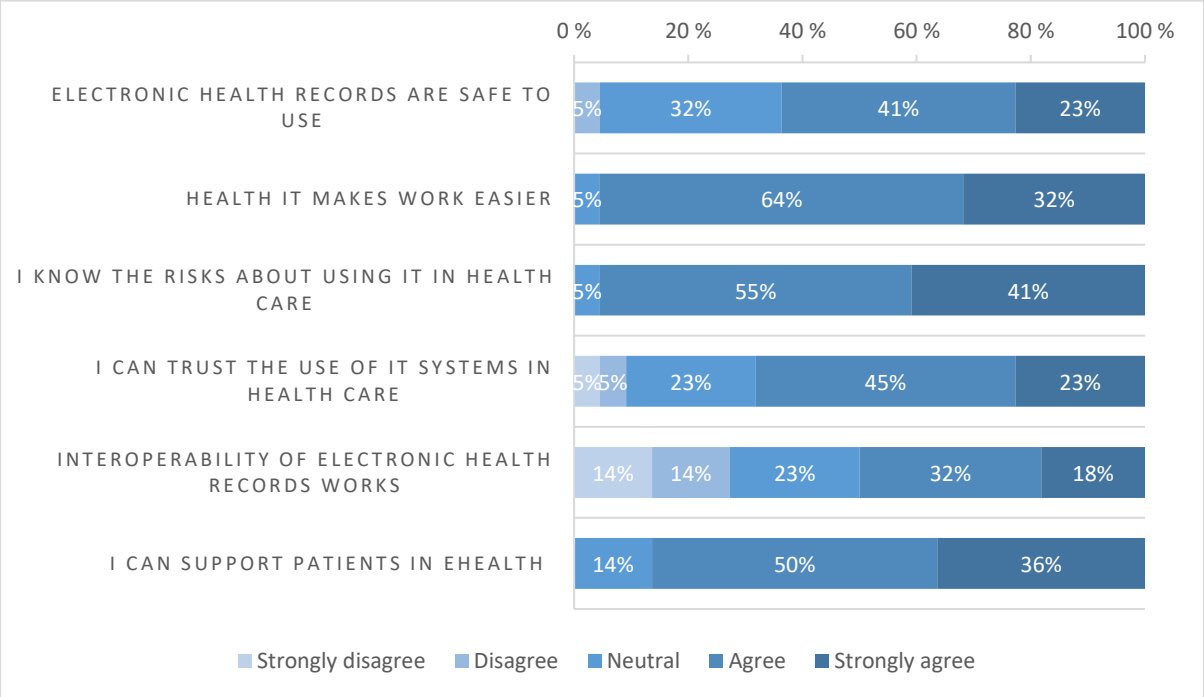

Figure 1: eHealth use and experiences (n= 22)

Respondents mostly agreed (96 %) that citizens need more education about IT use in health care. More than half (60 %) disagreed with the statement that citizens' know-how about eHealth is good. Less than half agreed that citizens can read their own patient documents (41 %) and slightly more than half agreed that they can access their own patient data (55 %). Half (50 %) of respondents thought eHealth was a current practice in health care (Figure 2).

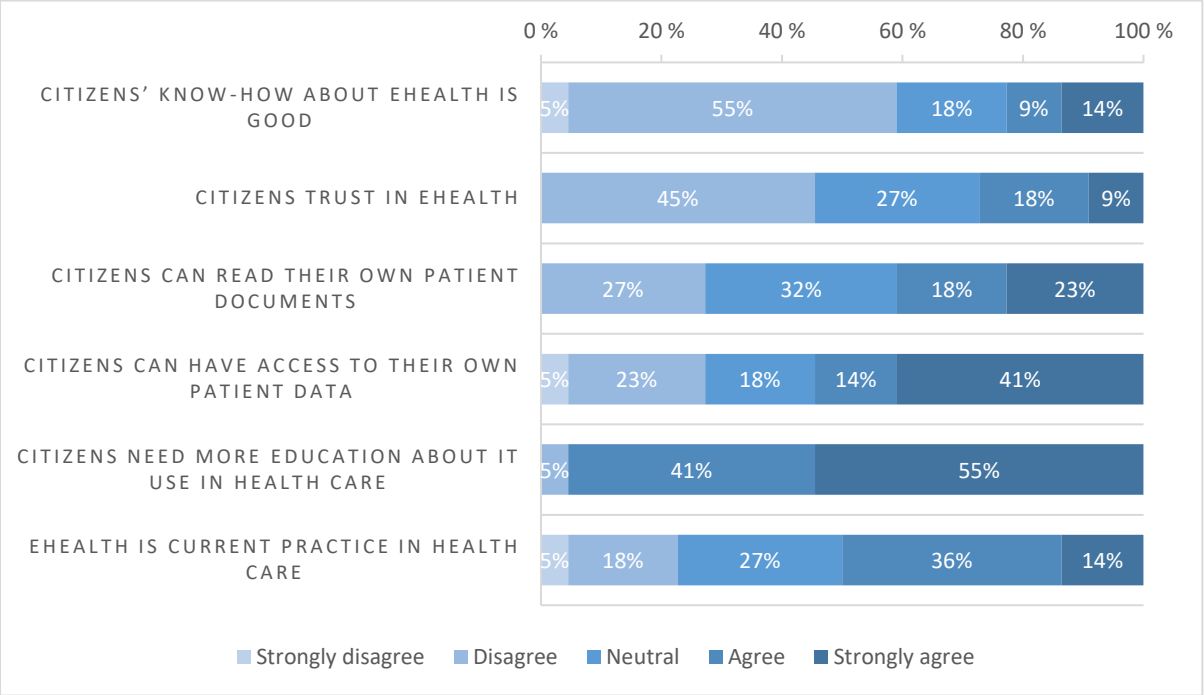

Figure 2: Citizens' eHealth skills and competences (n = 22)

As cons in eHealth practices, the respondents mentioned themes related to data protection and security, for instance data breaches and cyberattacks. Respondents' opinions about the value of eHealth were positive. eHealth has a great effect on service quality. eHealth supports the prevention of economic challenges in health care. However, eHealth also supports health care and research.

Experiences of the Erasmus program

All respondents agreed with the importance of lifelong learning and the importance of eHealth studies in the future. Students agreed that these studies were usable in the labor market (90 %, Figure 3).

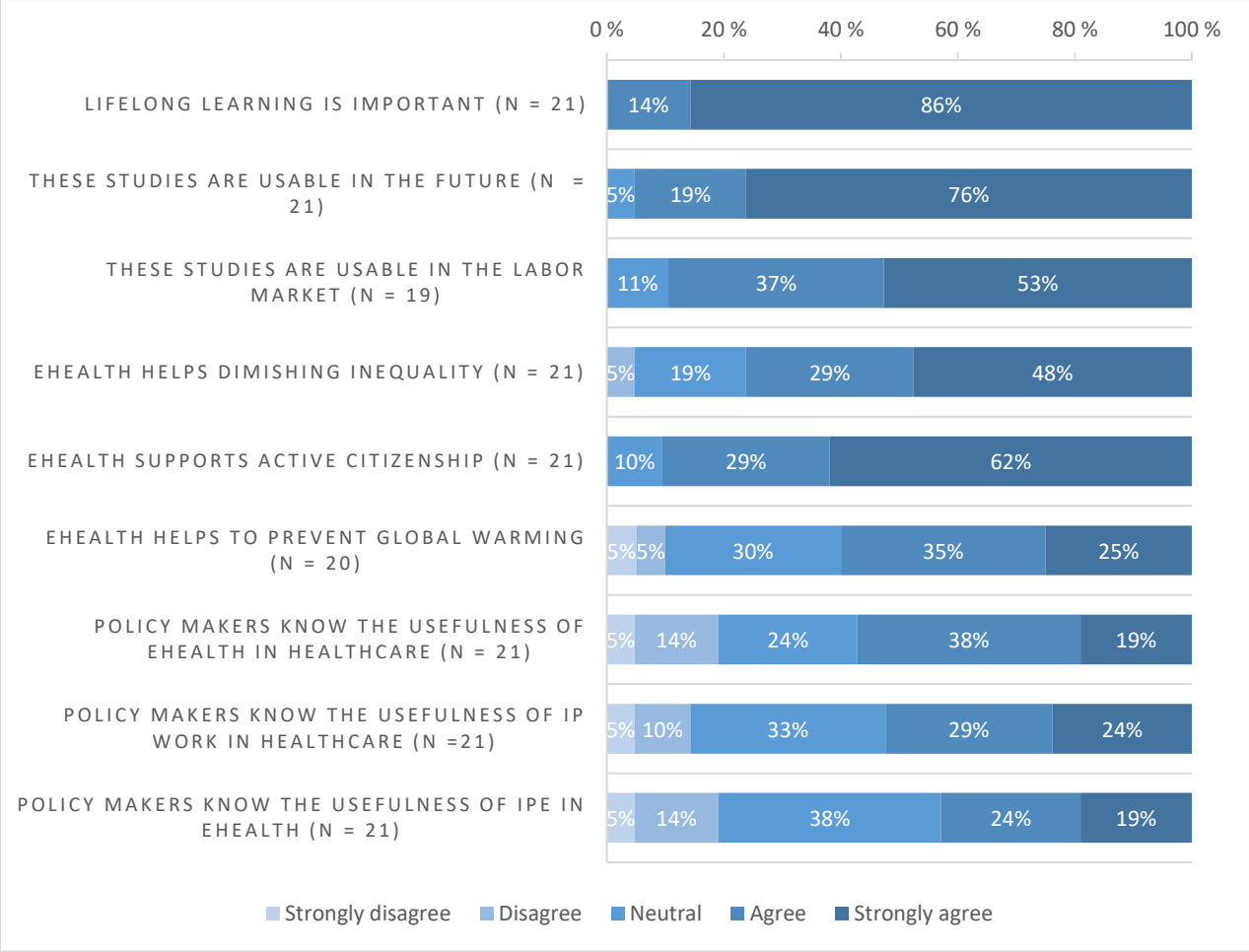

Figure 3: Experiences of the Erasmus program

Respondents mostly agreed (73 %) that eHealth helped to diminish inequality, eHealth supported active citizenship (90 %) and eHealth helped to prevent global warming (60 %). Respondents' opinions about policymakers' know-how concerning eHealth and healthcare were positive (57 %) as were opinions about policymakers' know-how concerning inter-professional work in healthcare (53 %). All teachers gave positive feedback on the eHealth4all@EU project.

3.4 Discussion

In this discussion part, results from all surveys have been combined. The main points of summary are given as answers to the main objectives of the project. The main points have been presented at the three-dimension levels: micro, meso and macro. In this paper, micro level represents students, meso level is organizations and the macro level is a global view.

Student level
Students and teachers had experience with inter-professional groups, international groups, and problem-based learning methods. Students agreed with the statement that eHealth knowledge is valuable today and will be in the future.

Students were highly motivated in these studies; they wanted to develop themselves and learn new skills. In the end, students agreed that the learning material and course content supported learning. Also, they agreed that the learning process and teaching methods were successful. The pre- and post-surveys for online courses indicated that students had increased their eHealth knowledge and students gave positive feedback on these studies.

Local level
Online courses had three phases: kick-off, a self-learning phase and virtual summer school. During the online course students and teachers could send messages to each other. Summer school started with a self-learning phase online and continued with lectures and group work.

Students completed group work together in international and inter-professional groups. This gave them the opportunity learn about other cultures' health care systems and eHealth solutions. Students liked working together and their discussions were fruitful and inspirational.

The risks and potential opportunities of eHealth are well known. Data protection and security issues were issues of concern for some respondents. However, the general opinion was that eHealth makes the health care field better.

Global level
Respondents agreed with the statement that students made new and helpful contacts. Discussions about other countries' healthcare systems and eHealth solutions gave participants new perspectives and models.

eHealth education is needed now and will be needed in the future. Challenges in health care systems and technology are common. More cooperation is needed to make sustainability solutions in the eHealth field. Most respondents agreed that eHealth can help with global warming and diminishing inequality.

4 Conclusions

Despite the small number of respondents, the results are promising. For various reasons the project did not include as many student responses as expected. During the project, promoting the courses to students was challenging. Primarily, the students heard about the courses through their university or from fellow students. Most of the students were female, which could be viewed as a weakness of this study from the viewpoint of participant diversity, however a strength is that these students were from various study fields.

Most of the students and teachers at least agree on the importance of inter-professionality, inter-professional education, and problem-based learning in eHealth. However, responses to post-online course surveys were more critical than pre-online course surveys. One explanation could be that during the courses, students realized eHealth and related topics are more complex than they originally thought. In the one summer school survey, students generally reported achieving their learning goals.

More research is needed on online learning skills and confidence in using online learning tools such as Moodle. Also, more research is needed on cross-cultural online learning, since experiences with eLearning tools could be different for different countries and institutions and there might be different habits for using these tools. It would have been interesting to know how much the international group of students communicated or sent messages to each other.

5 Recommendation

The aim of the project was to study inter-professional education in the eHealth context. Unfortunately, the unexpected Covid-19 pandemic forced changes in plans. After all, the project managed to create three online courses and one summer school session for higher education students, as well as expose students to scientific papers and panels. The created learning materials are available for teaching in the future.

Creating eHealth education for global higher education students between various universities and applied sciences is challenging. eHealth is a global topic, but simultaneously local cultural traditions for studying and applying health care systems must not be forgotten. There are cultural differences between countries in terms of timing, teaching, and studying, as well as with eHealth issues like documentation, software, security, and legal issues. More discussion is needed to build greater consensus among European countries based on these issues. From a global perspective, countries are taking steps toward a more digital approach to healthcare at variable speeds. However, enhancing global eHealth education continues to be important.

More research is needed in the field of eHealth education, including ways to support citizens and policymakers. All this collaboration and support are welcome and will be vital when European health data is stored in the European health data space as proposed by the European Commission.

6 References

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Appendix 1: CAF model and the connection to the dimensions of evaluation (Ammenwerth & Rigby 2016)

Dimension level	Categories of measures	Explanation of measures	Main objectives of the evaluation
Student (Micro)	Quality of course	Study materials, PBL, IPE, E-learning, EPR, study	1) demonstrate how to increase eHealth knowledge and skills of postgraduate students working in the health and care sectors, 5) demonstrate how problem-based learning in combination with geographically distributed groups who are digitally connected adds value to the learning outcomes
	Usefulness of course	Learning goals, learning, satisfaction, feedback of surveys	
	Net benefits of course	Net benefits of courses and project	
Local (Meso)	People	Citizens (individuals/groups, characteristics and expectations, responsibilities)	2) demonstrate how to enrich eHealth knowledge and skills through applying the inter-professionals and emphasizing interconnectivity, collaboration, and exchange as one of the most essential contributions of digitization to changes in health care and society, 3) demonstrate that the combination of technology-specific topics and related competencies equip the students with sound knowledge and skills for their career in a digital world, i.e., interoperability, data protection and security and data analytics/big data, with broader core competencies, i.e., innovation and entrepreneurship, leadership and governance and ethical and legal issues
	Organization	Organization (strategy, culture, infrastructures, processes, and value)	
	Implementation	Implementation refers to adoption stages, project management approaches, and extent of practice fit	
Global (Macro)	Policymakers	Roles of governing bodies, legislation, and advocacy groups	4) demonstrate the usefulness of cross-country education in the emerging field of digital health, 6) evaluate these approaches thoroughly with mixed methods and via internal and external partners. Disseminate this experience and the objective finding within the healthcare community and within society through well-established contacts all across Europe and worldwide, e.g. TIGER, EHTEL and others
	Funding (Erasmus+)	Remunerations, payments, and incentives that influence	
	Standards	Organizational performance and professional practice standards in place (European health data space)	
	Trends	Public expectations, and socioeconomic and political influence on eHealth	