

Intensive Study Program Geo3En

Evaluation by the participants

Summary report – Intellectual Output 10

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1 INTRODUCTION

The deliverable of the Intellectual Output 10 provides the content of the evaluation questionnaire and the presentation and analysis of these results provided by the participants to the program. This report provides good insights on the feedback this program can benefit from, on different aspects, e.g., the content, the expectations of participants, the organisation, and the quality of the pedagogical approach implemented.

2 EVALUATION QUESTIONNAIRE CONTENT

Three main aspects were quantified in the evaluation of the ISP program by the participants, e.g. the content, the organisation and the quality of the supervision.

The questions were detailed for each online and on-site ISP program organized by each partner institution, focusing on first giving an overall quantitative grade, then quantifying the estimation of the personal workload required to follow each module, the interest in the course content from 1 to 10. The course organization and content were qualitatively evaluated (Figure 1), as well as the contribution to learning with several sub-items listed hereafter (Figure 2).

Course organisation and content *

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Learning objectives were clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Course content was organized and well planned	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Course workload was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Course organized to allow all students to participate fully	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Figure 1: Criterias of evaluation of course organisation and content

Contribution to learning *

	Poor	Fair	Satisfactory	Very good	Excellent
Level of skill/knowledge at start of course	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of skill/knowledge at end of course	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of skill/knowledge required to complete the course	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contribution of course to your skill/knowledge	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2: Criterias of qualitative evaluation of the contribution to learning from each course

Each main instructor and supervisor was also evaluated by the ISp participants, on a qualitative basis following five criterias:

- Instructor was an effective lecturer/demonstrator
- Presentations were clear and organized
- Instructor stimulated student interest
- Instructor effectively used time during class periods
- Instructor was available and helpful

And the grading varying between strongly disagree, disagree neutral, agree and strongly agree.

Finally, open text questions were conceived to gather more developed opinions and ideas, propositions regarding, 1) the aspects of the courses which were the most useful or valuable, and 2) suggestions on how to improve the course.

For specific on-site ISP covering both engineering and geoscience, specific questions were also designed to test the interest in both fields of the participants.

The questionnaire finishes by asking participants to grade on a linear scale the ISP program and to gather with open text field opinions on potential program improvement, suggestions on how to

integrate the ISP in a master level program, and the main reason why the students decided to take part to the ISP program.

The questionnaire was framed as a google form and available online to the participants for 10 days after the end of the program. Participants were asked for their mail addresses and for their names. The questionnaire was not anonymous so that organisation ensured that every participant answered, and be able to differentiate answers from students with various educational domains. To protect the identity and confidentiality of the answers, the overall database of the results will thus not be open.

3 STUDENTS EVALUATION RESULTS

3.1 GENERAL EVALUATION

The questionnaire was answered by 22 out of the 23 participants of the ISP.

The overall grade on a linear scale reaches 8.2/10 (Figure 3), with only one grade below 7/10, highlighting the overall satisfaction of the participants to the ISP program.

The participants express their will to participate in the program, first because of the interest they have on the program content, as it offered them a wide panel of multi-disciplinary knowledge and skills to be developed.

Geo3EN - Overall note

22 responses

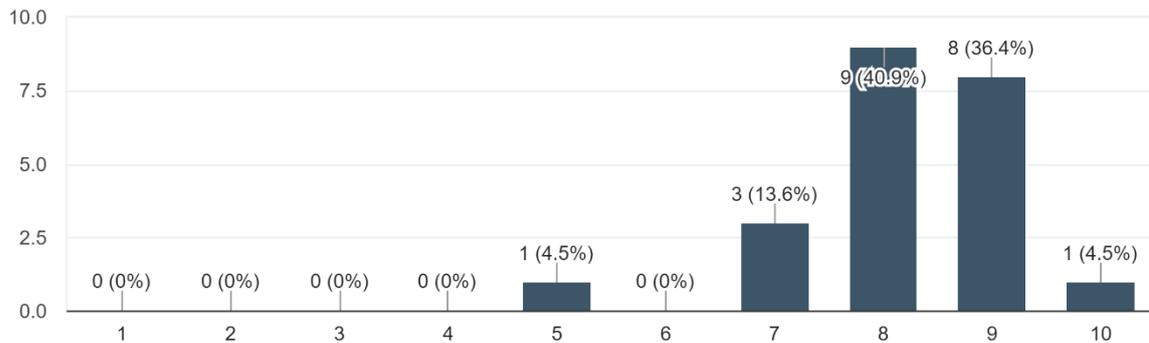


Figure 3: Geo3En overall grade distribution by the participants

Why did you choose to participate to the ISP?

22 responses

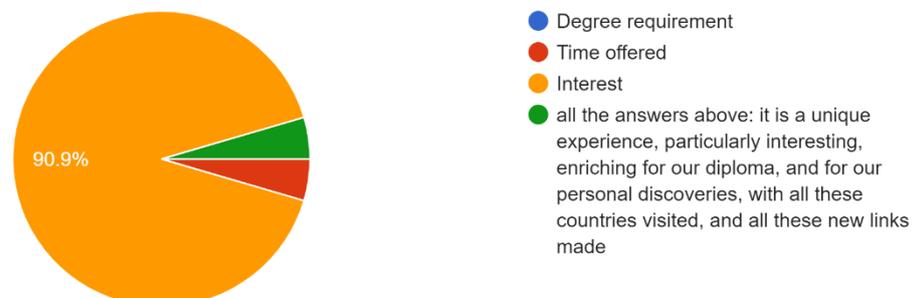


Figure 4: Distribution of the main reason of participation of the students to the program

The participants were allowed to express overall remarks on the improvement of the ISP program which are listed below:

- ISP programm condensed in 8 weeks almost one after another is a too short time period for participants to assimilate all notions seen.
- English proficiency should be a pre-requisite for any participant, to ensure proper understanding of the courses content as well as proper communications skills with co-fellows
- Clarification of learning objectives and list of deliverables.
- Limit the number of online lectures, as it is more difficult to follow than in-class sessions
- Physically strenuous programm for some sessions, information to participants on these points should be improved

The participants also provided some opinions and suggestions on how to integrate this in a master program:

- Very enthusiastic on teh content and the diversity of case studies implemented
- A very well organised time schedule would be necessary at teh beginning of the master, due to travels, visas, and logistic issues
- In the framework of multi-background teams, then their cooperation should be required in exercises from all types of domains.
- Integrating this ISP in a master programm would be amazing and beneficial. I think employers would be all impressed.
- The balance between natural science and engineering shall be equilibrated, in the ISP, engineering was not developed as much as geosciences aspects.
- I think that such a master's program could be of interest to many people, and should therefore be promoted. Geothermal energy is an exciting field that affects many sectors, and represents part of the solution for energy issues. it is a very interesting field of study, and too little present in the university study options
- A big organization would obviously be needed for such a program: with all these different countries involved, the different working habits/rhythms according to the universities. I think it is very important to describe as much as possible what subjects and concepts are taught with this program, so as not to surprise future students (geology students had to assimilate a lot of things concerning electrical networks, and vice versa, the geology is very complex for beginners!)
- Add software training on the DMS tool
- The ISP it is clearly a potential set of contents for a master course. I think it has a lot of structure already being the first (experimental) run of the program. The ISP is relevant and necessary in the context of energy transition and I really hope it succeeds.

Here after is provided the detailed evaluation of each component of the overall programm followed by the participants from April to June 2022.

3.2 TU DARMSTADT ONLINE EVALUATION

The online part of the ISP at TU Darmstadt has been evaluated very positively by participants, with an overall grade above 8,5/10 (Figure 5), with an interest in the course content rated above 8/10 (Figure 6). The participants judged that this online course brought their level of skills above very good after the ISP (Figure 7), even if their evaluation of these skills before the course was heterogeneous, depending on students study background. Both instructors were very positively evaluated (Instructor A, Dr. Bossennec, Figure 8 and Instructor B, Mrs Raos, Figure 9), with participants answering positively or very positively to the following criteria: effective lecturer/demonstrator, presentations clear and organised, stimulation of participants interest, effective use of time, and availability and helpfulness of the instructors.

Online ISP Darmstadt - Overall note

22 responses

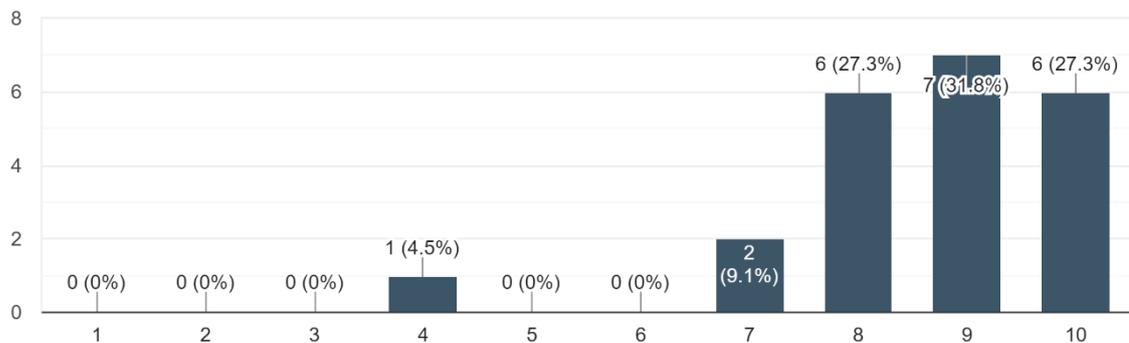


Figure 5: ISP Online TU Darmstadt grade distribution by the participants

Interest in the course content

22 responses

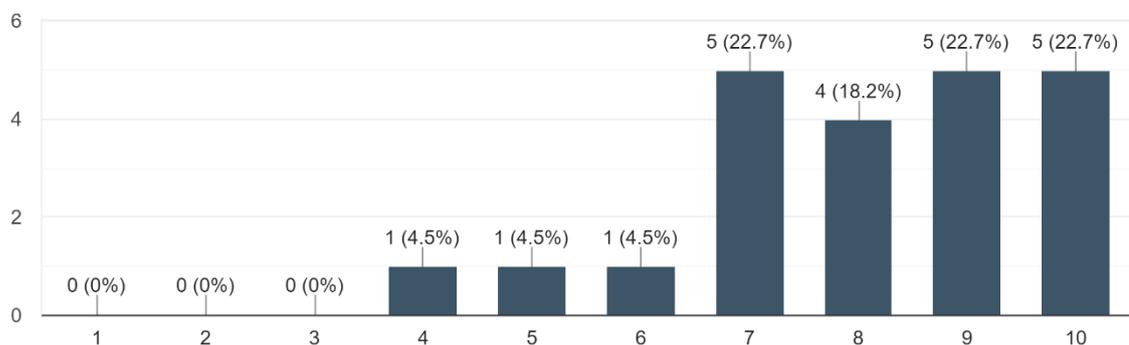


Figure 6: Interest in the course grade distribution by the participants for TU Darmstadt online ISP

Contribution to learning



Figure 7: Qualitative evaluation of the contribution to learning from the participants for TU Darmstadt online ISP

Skill and responsiveness of the instructor

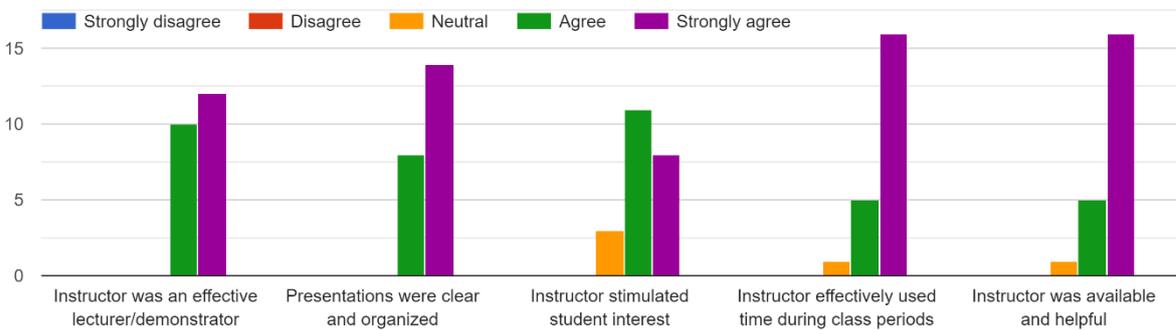


Figure 8: Qualitative evaluation of the pedagogy of the main instructor from the participants for TU Darmstadt online ISP

Skill and responsiveness of the instructor

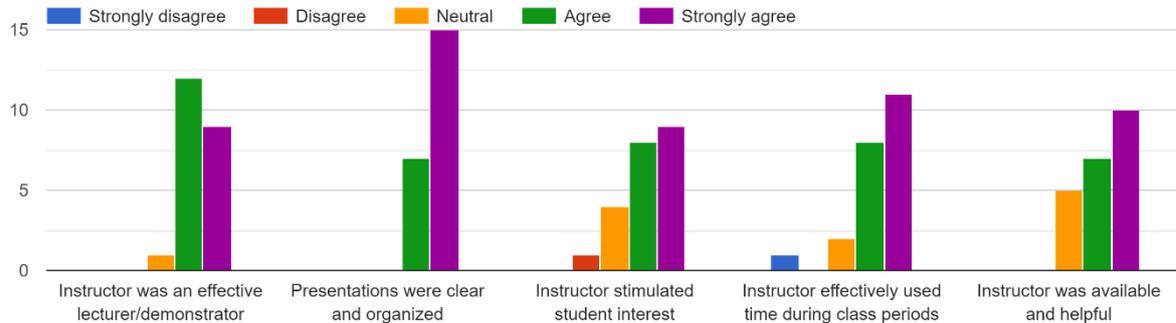


Figure 9: Qualitative evaluation of the pedagogy of the second instructor from the participants for TU Darmstadt online ISP

3.3 TU DARMSTADT ON SITE EVALUATION

The onsite part of the ISP at TU Darmstadt, consisting of laboratory sessions, with active measurements performed by students has been evaluated very positively by participants, with an overall grade above 8,9/10 (Figure 10), with an interest in the course content rated above 8,8/10 (Figure 11). The participants explicitly express their interest in the laboratory workflow, with a grade above 9/10 (Figure 12), and judged the organisation and content very positively (Figure 13). The participants judged that this on-site ISP brought their level of skills above very good after the ISP even if their evaluation of these skills before the course was heterogeneous, depending on students study background (Figure 14). They particularly emphasise the accessibility of the course, which does not necessitate pre-requirements, with a lot of practical inputs and activities, as well as team organisation. Instructors were positively evaluated (Figure 15), with participants answering positively or very positively to the following criteria: effective lecturer/demonstrator, presentations clear and organised, stimulation of participants interest, effective use of time, and availability and helpfulness of the instructors.

Laboratory session On Site Darmstadt ISP - Overall note

22 responses

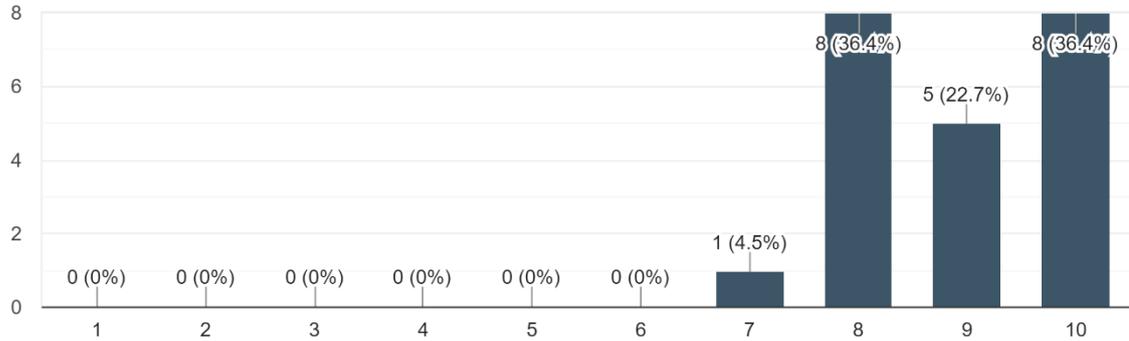


Figure 10: ISP Onsite TU Darmstadt grade distribution by the participants

Interest in the course content

22 responses

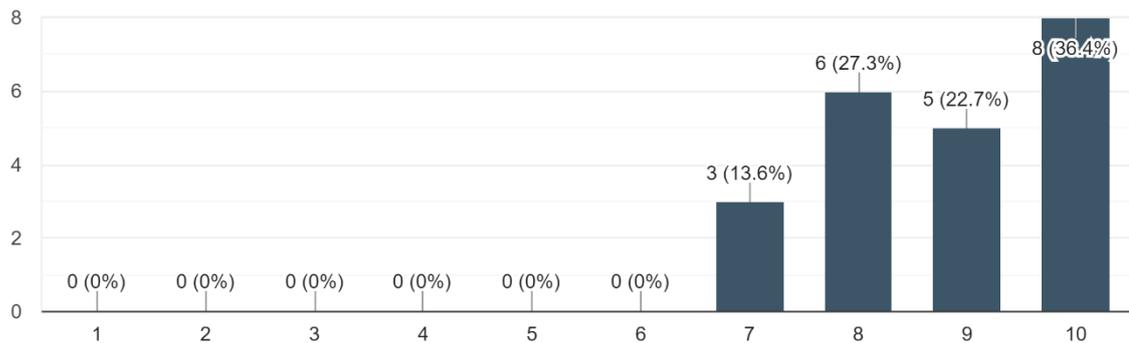


Figure 11: Interest in the course grade distribution by the participants for TU Darmstadt onsite ISP

Interest in the laboratory measurements and tour

22 responses

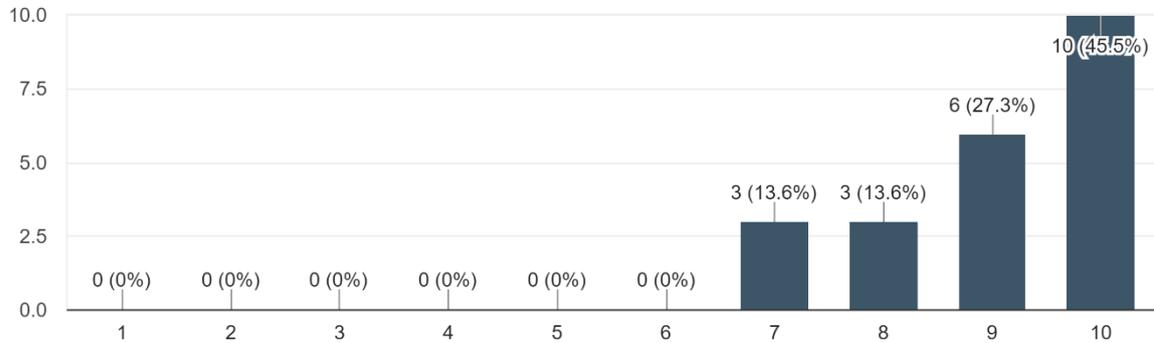


Figure 12: Interest in the laboratory measurements and explanations, distribution by the participants for TU Darmstadt onsite ISP

Course organisation and content

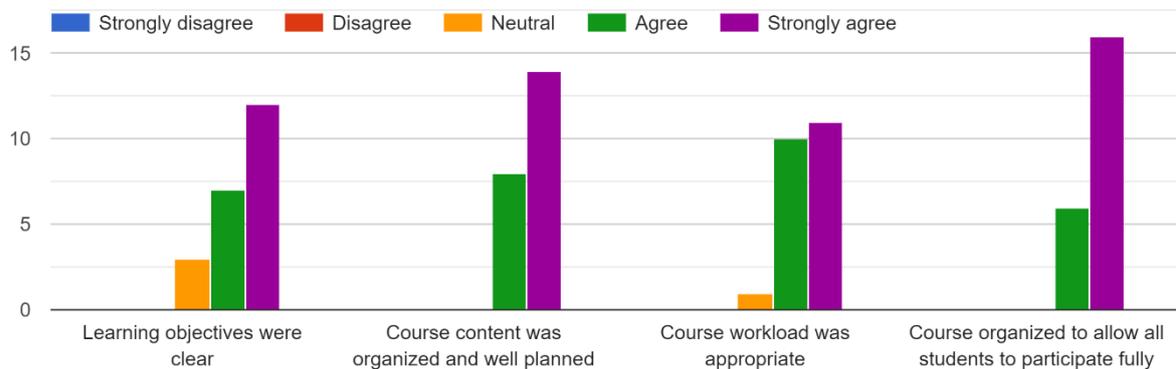


Figure 13: Qualitative evaluation of the course organisation and content of the On-site ISP at TU Darmstadt

Contribution to learning



Figure 14: Qualitative evaluation of the contribution to learning from the participants for TU Darmstadt onsite ISP

Skill and responsiveness of the instructor

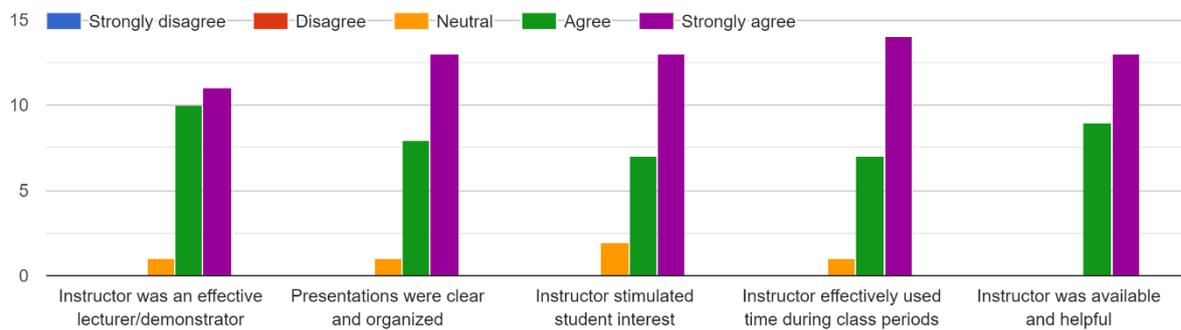


Figure 15: Qualitative evaluation of the pedagogy of the instructor from the participants for TU Darmstadt onsite ISP

3.4 LA SALLE ONLINE EVALUATION

The online part of the ISP at La Salle has been evaluated positively by participants, with an overall grade above 7,3/10 (Figure 16), with an interest in the course content rated above 7,9/10 (Figure 17). The participants judged that this online course brought their level of skills above satisfactory after the ISP (Figure 18), even if their evaluation of these skills before the course was heterogeneous, depending on students study background. Instructors were overall evaluated as good (Figure 19), with participants answering from neutral to positively to the following criteria: effective lecturer/demonstrator, presentations clear and organised, stimulation of participants interest, effective use of time, and availability and helpfulness of the instructors. Some participants though point out some poor to fair organisation and clarity of presentations and formats, which in detail are linked to technical problems with the 3D Visualiser for the datasets.

Online ISP LaSalle - Overall note

22 responses

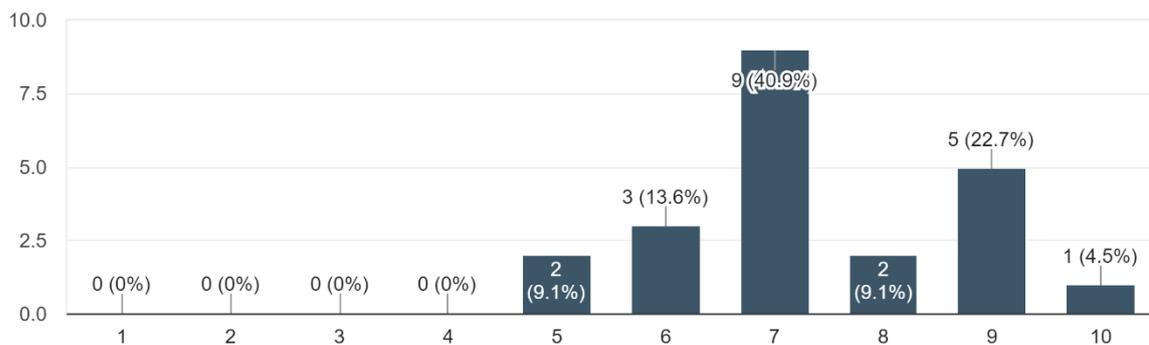


Figure 16: ISP Online LaSalle grade distribution by the participants

Interest in the course content

22 responses

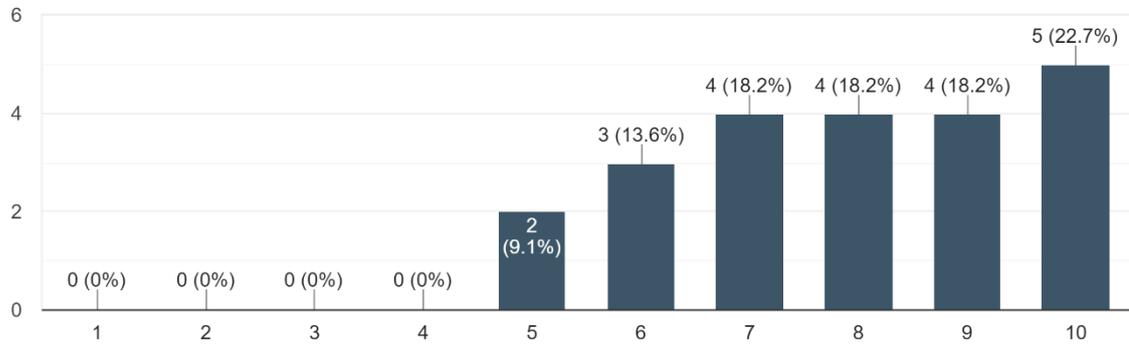


Figure 17: Interest in the course grade distribution by the participants for LaSalle online ISP

Contribution to learning



Figure 18: Qualitative evaluation of the contribution to learning from the participants for LaSalle online ISP

Skill and responsiveness of the instructor

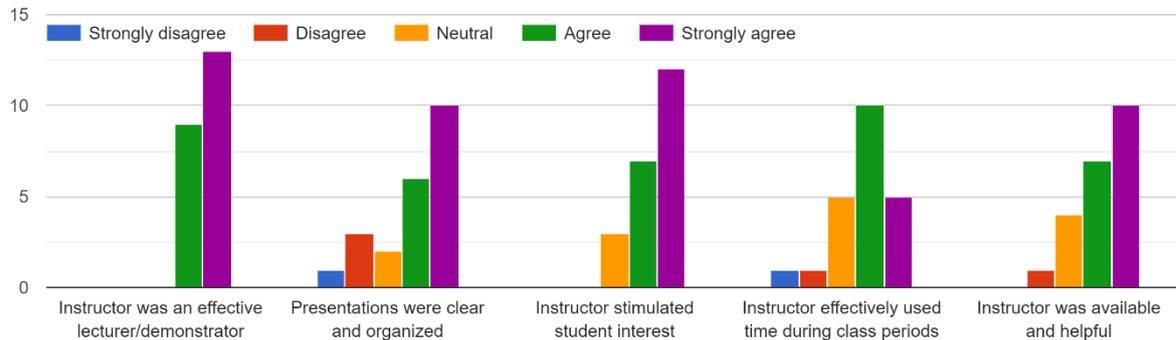


Figure 19: Qualitative evaluation of the pedagogy of the instructor from the participants for LaSalle onlineISP

3.5 LA SALLE ONSITE EVALUATION

The onsite part of the ISP organised by LaSalle, consisting of fieldwork between the Black Forest in Germany and the Vosges in France, and geothermal sites visits in the productive area of the Upper Rhine Graben, has been evaluated positively by participants, with an overall grade at 7/10 (Figure 20), with an interest in the course content rated above 8,2/10 (Figure 21). The participants explicitly express their interest in the field excursions and field work in mines and on outcrops, with a grade above 8/10 (Figure 22), and in the geothermal production sites (evaluation above 8,9/10, Figure 23) and judged the organisation and content positively (Figure 24). Several participants pointed though the high workload and high time schedule for this field work week. These remarks should be taken into account for further development, so that participants are not exhausted, and can keep their motivation. The participants judged that this on-site ISP brought their level of skills above very good after the ISP even if their evaluation of these skills before the course was heterogeneous, depending on students study background (Figure 25). Instructors were positively evaluated (Figure 26 and Figure 27), with participants answering positively or very positively to the following criteria: effective lecturer/demonstrator, presentations clear and organised, stimulation of participants interest, effective use of time, and availability and helpfulness of the instructors.

ON SITE LaSalle ISP (Colmar Fieldwork) - Overall note

22 responses

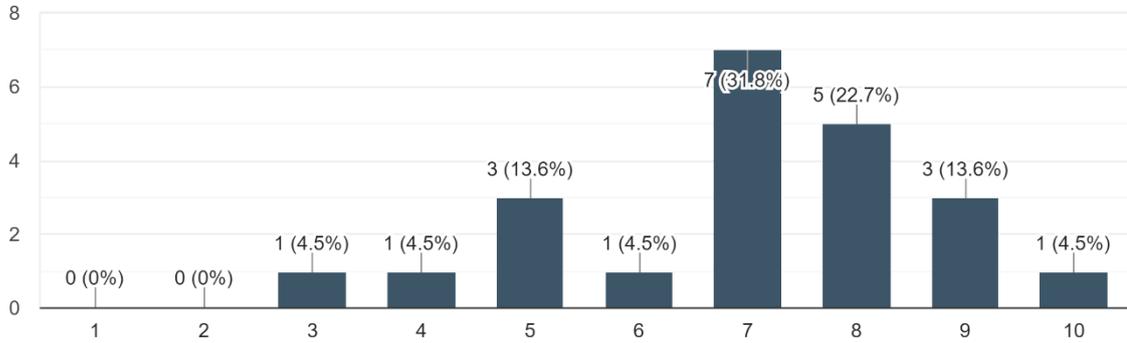


Figure 20: ISP Onsite LaSalle grade distribution by the participants

Interest in the course content

22 responses

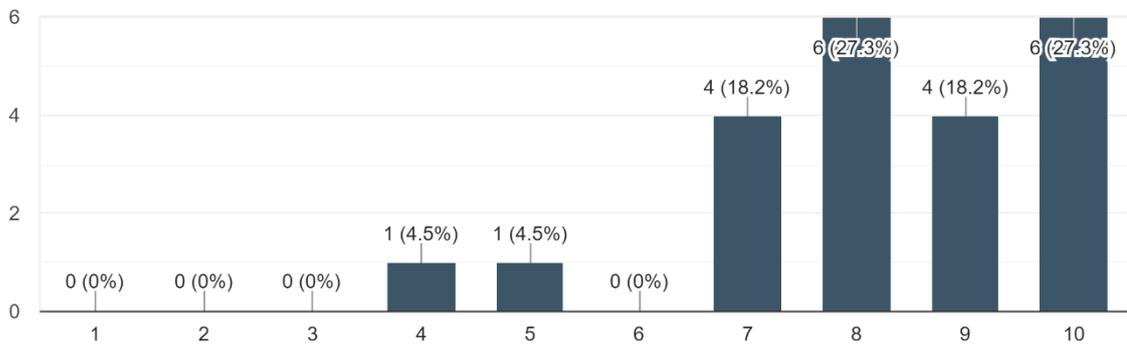


Figure 21: Interest in the course grade distribution by the participants for LaSalle onsite ISP

Interest in the geological outcrops sites

22 responses

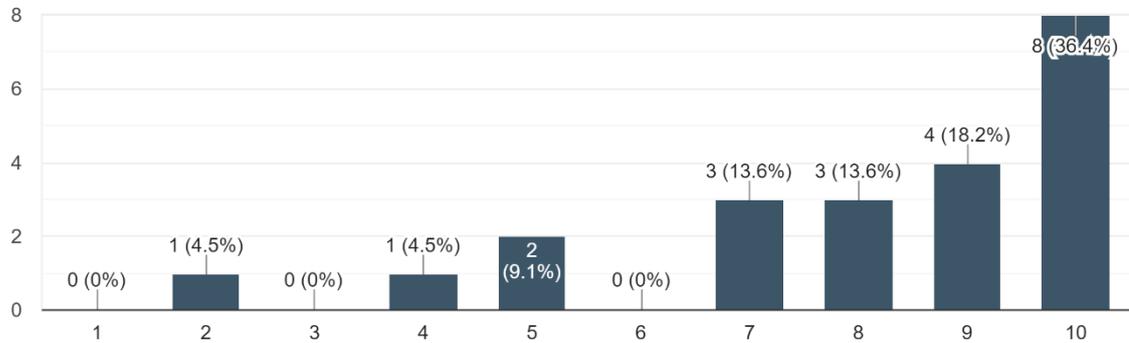


Figure 22: Interest in the course grade distribution by the participants for LaSalle onsite geological sites activities.

Interest in the geothermal plants sites

22 responses

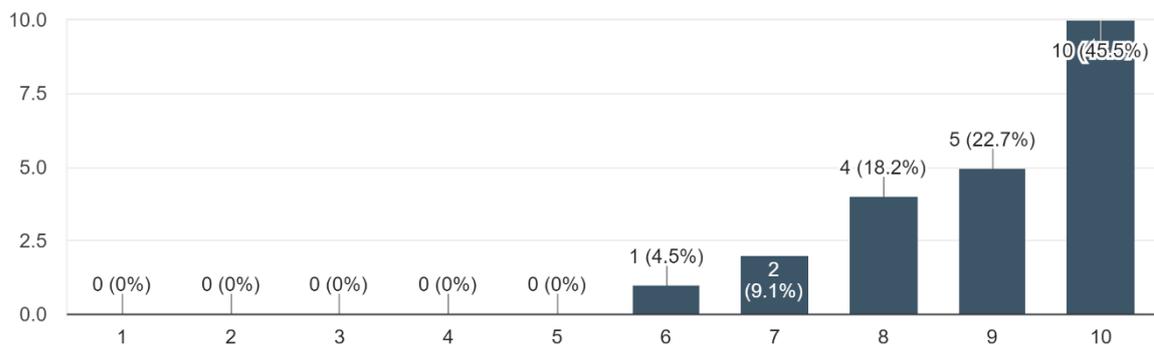


Figure 23: Interest in the course grade distribution by the participants for LaSalle onsite geothermal plants visits.

Course organisation and content

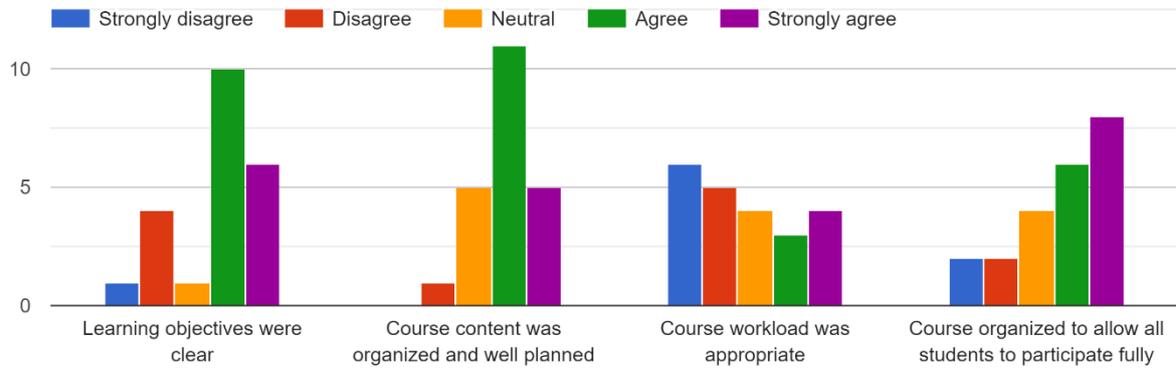


Figure 24: Qualitative evaluation of the course organisation and content of the On-site ISP by LaSalle.

Contribution to learning



Figure 25: Qualitative evaluation of the contribution to learning from the participants for LaSalle onsite ISP

Skill and responsiveness of the instructor

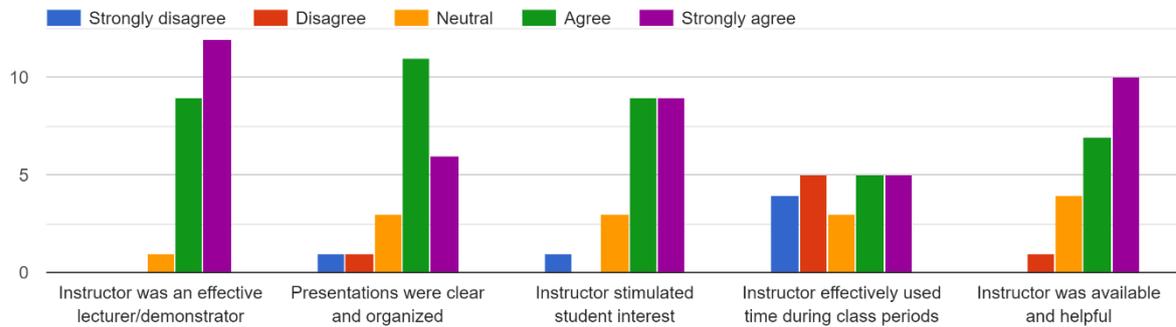


Figure 26: Qualitative evaluation of the pedagogy of the instructor A, Dr. Trullenque from the participants for LaSalle onsite ISP

Skill and responsiveness of the instructor

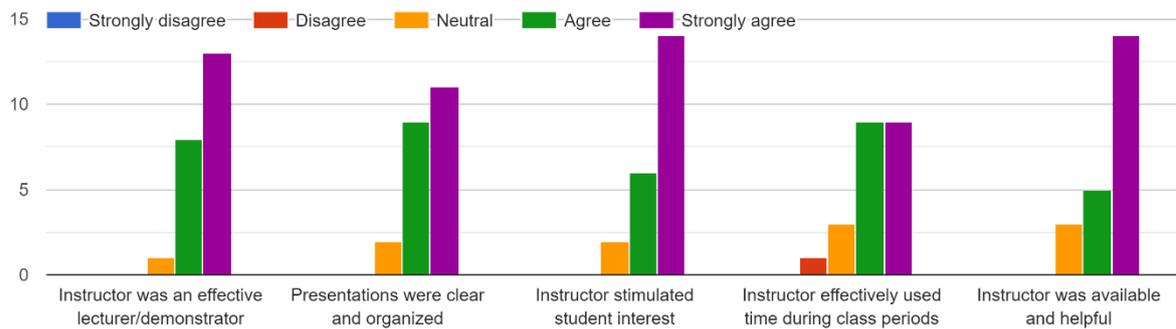


Figure 27: Qualitative evaluation of the pedagogy of the instructor B, Dr. Bossennec from the participants for LaSalle onsite ISP

3.6 FER UNI ZAGREB ONLINE EVALUATION

The online ISP organised by the FER Uni Zagreb has been evaluated positively by participants, with an overall grade above 8,6/10 (Figure 28), with an interest in the course content rated above 8,6/10 (Figure 29). The participants judged that this online course brought their level of skills above satisfactory after the ISP (Figure 30), even if their evaluation of these skills before the course was heterogeneous, depending on students study background. Instructors were overall evaluated as good (Figure 31), with participants answering from positive to very positive to the following criteria: effective lecturer/demonstrator, presentations clear and organised, stimulation of participants interest, effective use of time, and availability and helpfulness of the instructors

Online ISP Uni Zagreb - Overall note
22 responses

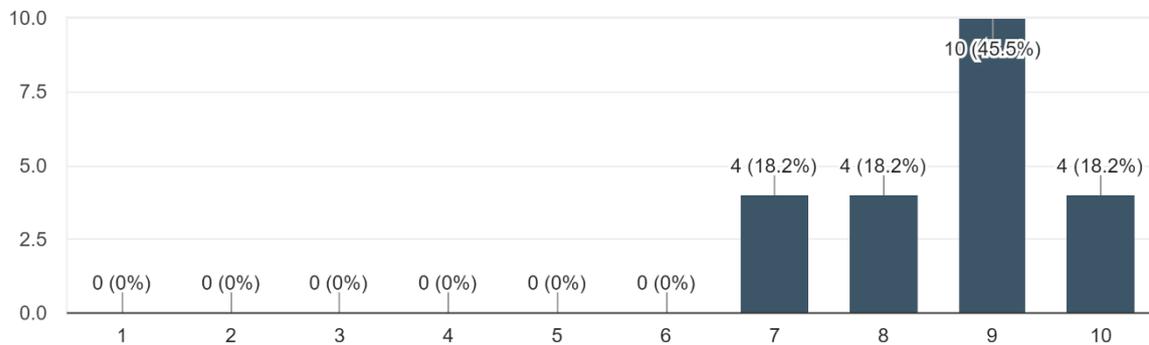


Figure 28:ISP Online FER Uni Zagreb grade distribution by the participants

Interest in the course content
22 responses

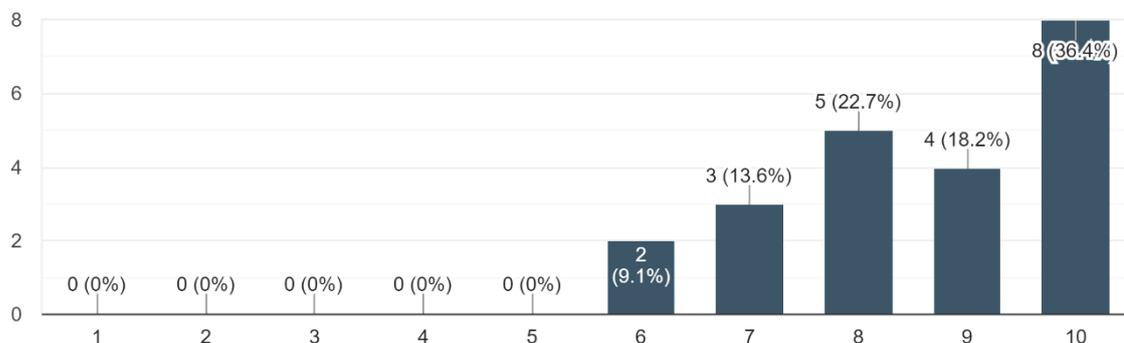


Figure 29: Interest in the course grade distribution by the participants for ISP Online FER Uni Zagreb

Contribution to learning



Figure 30: Qualitative evaluation of the contribution to learning from the participants for FER Uni Zagreb online ISP

Skill and responsiveness of the instructor

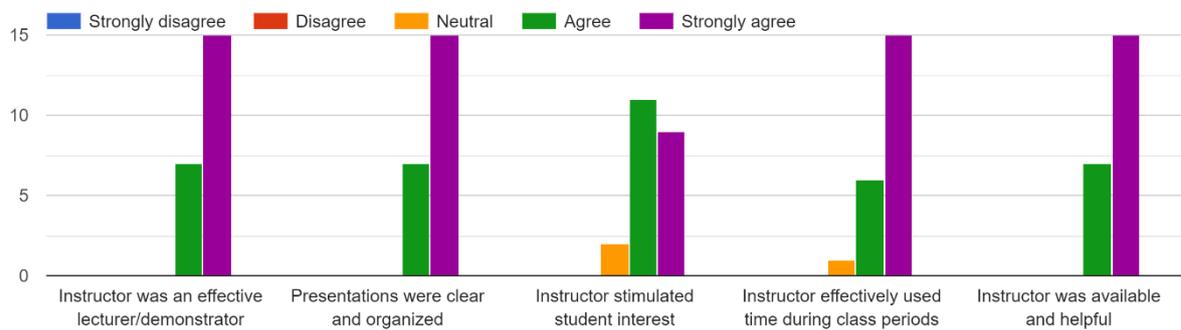


Figure 31: Qualitative evaluation of the pedagogy of the instructor for online ISP by FER Uni Zagreb

3.7 FER UNI ZAGREB ONSITE EVALUATION

The onsite part of the ISP organised by the FER department of Uni Zagreb, consisted of sites visits in various energetic productions areas. This ISP has been evaluated extremely positively by participants, with an overall grade at 9,4/10 (Figure 32), with an interest in the course content rated above 9,1/10 (Figure 33Figure 21). The participants explicitly express their interest in energy production sites (evaluation above 9,2/10) and judged the organisation and content very positively. Several participants pointed out the overall very nice hospitality of Croatian site holders and visit organisers. The participants judged that this on-site ISP brought their level of skills above very good after the ISP even if their evaluation of these skills before the course was heterogeneous, depending on students study background (Figure 34). Instructors were positively evaluated (Figure 35), with participants answering positively or very positively to the following criteria: effective lecturer/demonstrator, presentations clear and organised, stimulation of participants interest, effective use of time, and availability and helpfulness of the instructors.

ON SITE ISP Uni Zagreb - Overall note

22 responses

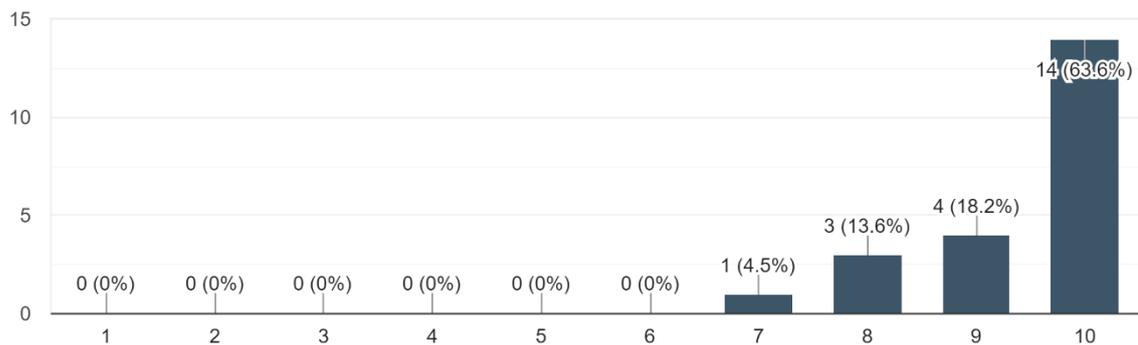


Figure 32: ISP Onsite FER Uni Zagreb grade distribution by the participants

Interest in the course content

22 responses

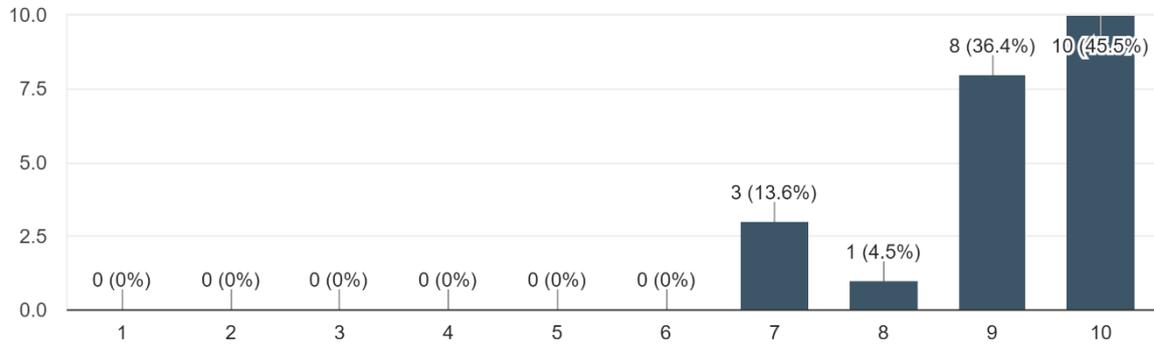


Figure 33: Interest in the course grade distribution by the participants for ISP Onsite FER Uni Zagreb

Contribution to learning



Figure 34: : Qualitative evaluation of the contribution to learning from the participants for FER Uni Zagreb online ISP

Skill and responsiveness of the instructor

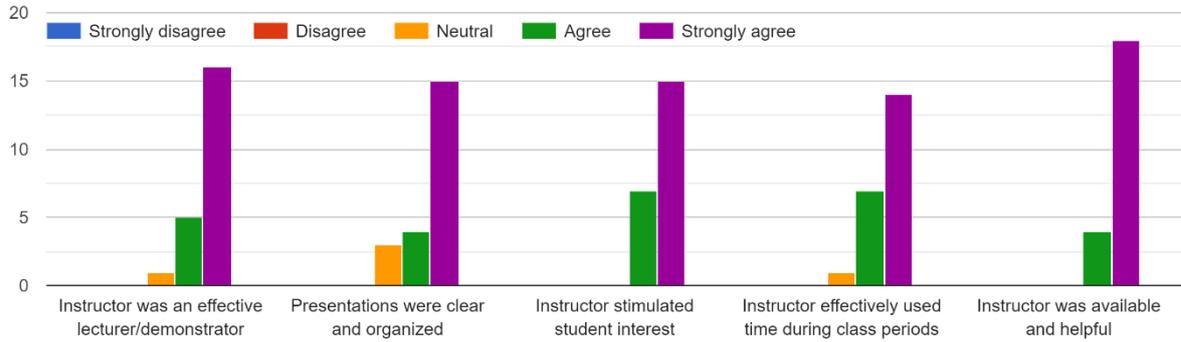


Figure 35: Qualitative evaluation of the pedagogy of the instructors for onsite ISP by FER Uni Zagreb

3.8 UNI REYK ONLINE EVALUATION

The online ISP organised by theUNI Reyk has been evaluated very positively by participants, with an overall grade at 9/10 (Figure 36), with an interest in the course content rated above 9,2/10 (Figure 37). The participants judged that this online course brought their level of skills above satisfactory after the ISP(Figure 38) even if their evaluation of these skills before the course was heterogeneous, depending on students study background. Instructors were overall evaluated as very good to excellent (Figure 39), with participants answering from positive to very positive to the following criteria: effective lecturer/demonstrator, presentations clear and organised, stimulation of participants interest, effective use of time, and availability and helpfulness of the instructors.

Online ISP Uni Reykjavik - Overall note

22 responses

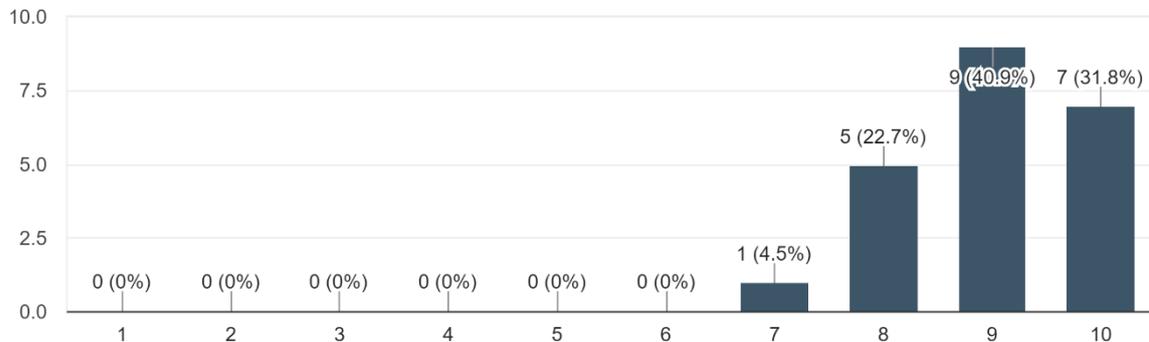


Figure 36: ISP Online UNI Reyk grade distribution by the participants

Interest in the course content

22 responses

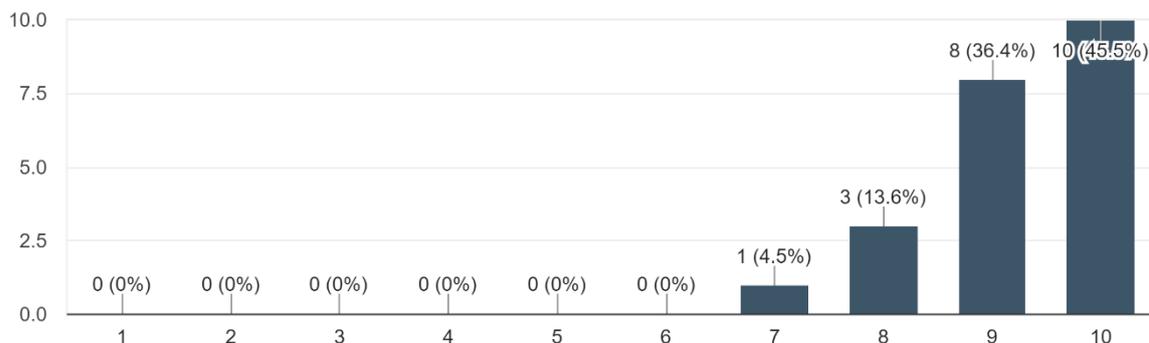


Figure 37: Interest in the course grade distribution by the participants for ISP Online by UNI Reyk

Contribution to learning



Figure 38: Qualitative evaluation of the contribution to learning from the participants for ISP Online by UNI Reyk

Skill and responsiveness of the instructor

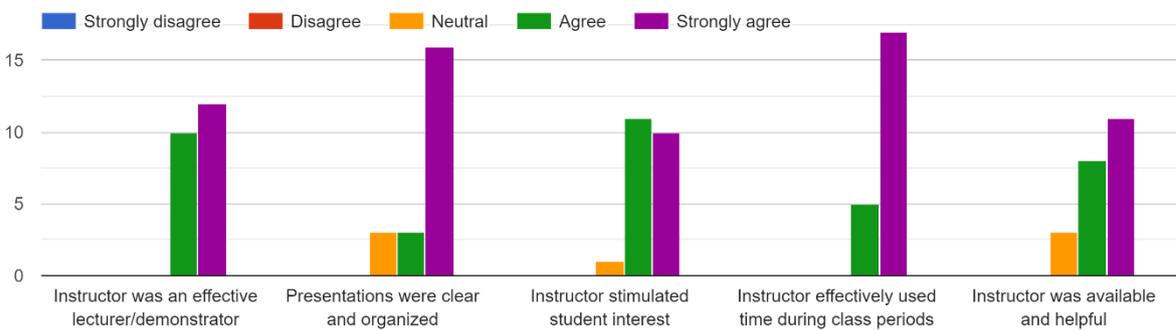


Figure 39: Qualitative evaluation of the pedagogy of the instructors for ISP Online by UNI Reyk

3.9 UNI REYK ONSITE EVALUATION

The onsite part of the ISP organised by UNI Reyk, consisted of geological sites and geothermal production sites visits in Iceland. This ISP has been evaluated extremely positively by participants, with an overall grade at 9/10 (Figure 40), with an interest in the course content rated at 9/10. The participants explicitly express their interest in the various places and excursions organised (evaluation above 9,4/10 for geological sites, Figure 41, and 9,1/10 for geothermal power plants sites, Figure 42). The organisation and content was positively evaluated (Figure 43). Several participants pointed out though that weather conditions and fitness level required to perform some field trips were above their limit and would require more preparation in advance, and that learning objectives were not always clearly defined. The participants judged that this on-site ISP brought their level of skills above very good (Figure 44) after the ISP even if their evaluation of these skills before the course was heterogeneous, depending on students study background. With a few exception, instructors were positively evaluated (Figure 45), with participants answering neutral, positively or very positively to the following criteria: effective lecturer/demonstrator, presentations clear and organised, stimulation of participants interest, effective use of time, and availability and helpfulness of the instructors.

On Site Uni Reykjavik ISP - Overall note

22 responses

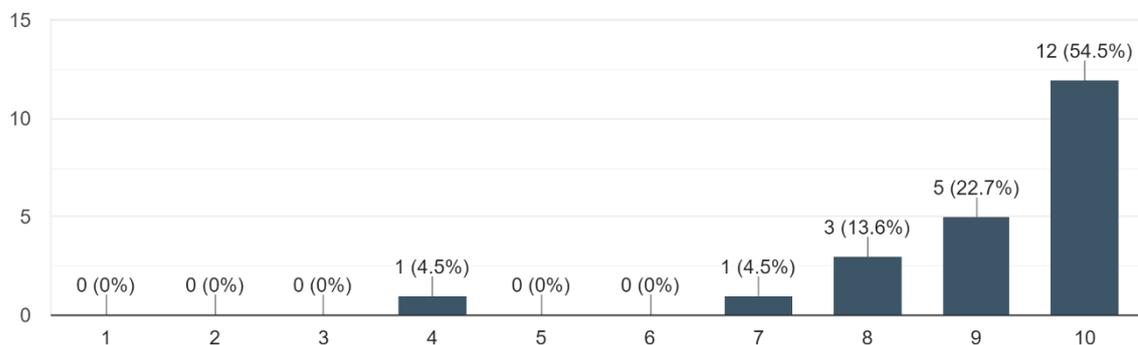


Figure 40: ISP Onsite UNI Reyk grade distribution by the participants

Interest in the geological outcrops sites

22 responses

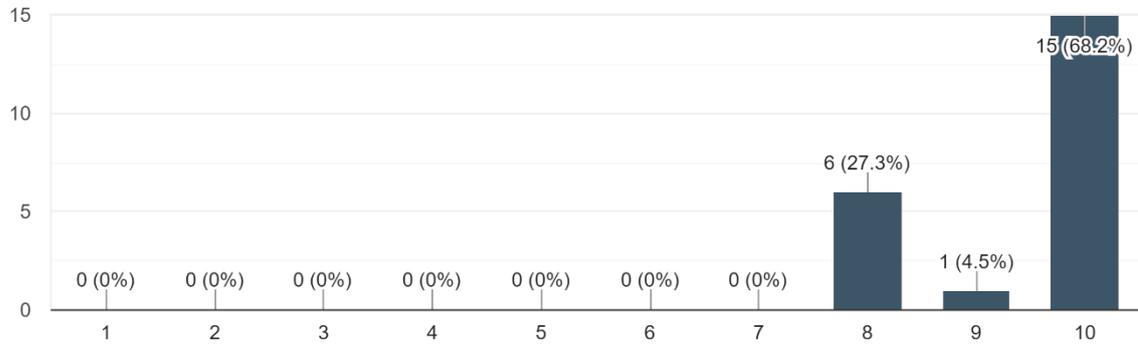


Figure 41: Interest in the course grade distribution by the participants for UNI Reyk onsite geological outcrops visits.

Interest in the geothermal plants sites

22 responses

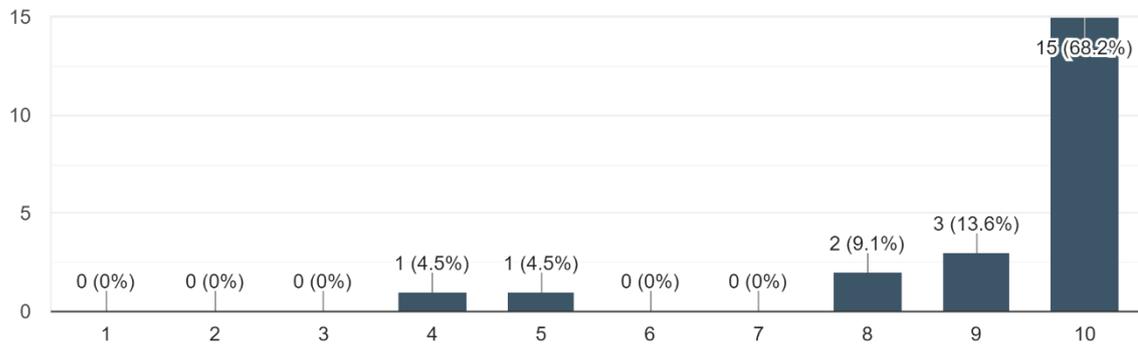


Figure 42: Interest in the course grade distribution by the participants for UNI Reyk onsite geothermal plants visits.

Course organisation and content

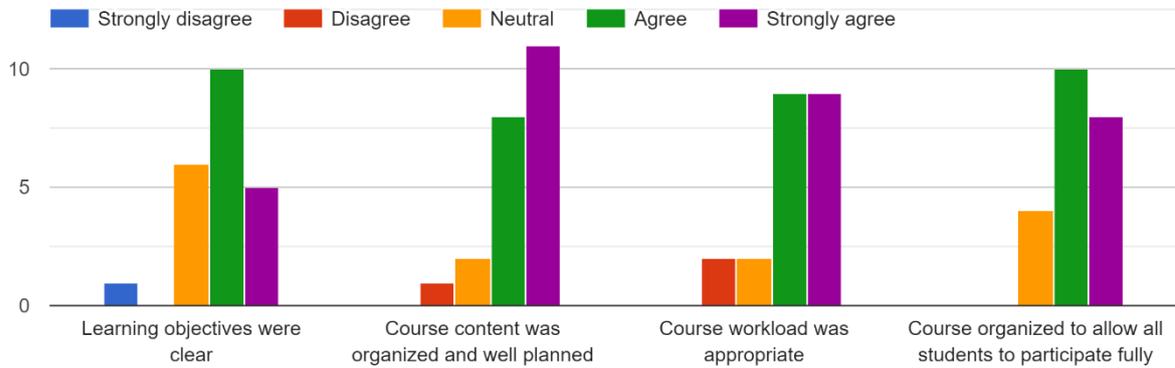


Figure 43: Qualitative evaluation of the course organisation and content of the On-site ISP by UNI Reyk

Contribution to learning



Figure 44: Qualitative evaluation of the contribution to learning from the participants for ISP Onsite by UNI Reyk

Skill and responsiveness of the instructor

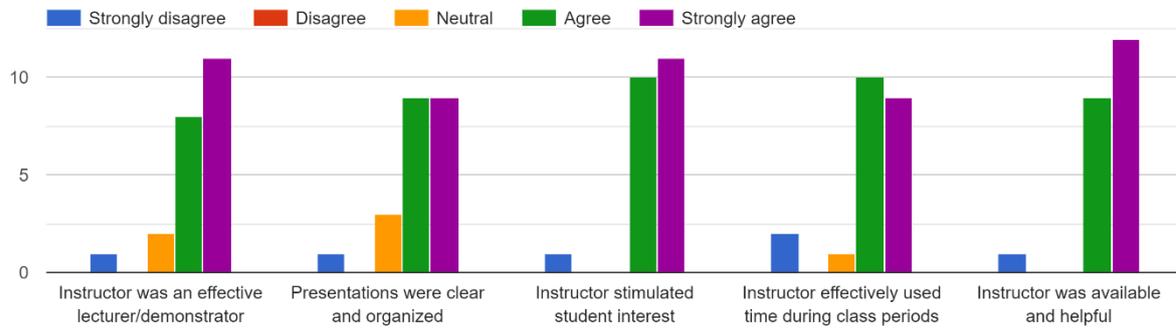


Figure 45: Qualitative evaluation of the pedagogy of the instructors for ISP Onsite by UNI Reyk

4 CONCLUSIONS

To summarise, the geo3En Intensive study program was evaluated as extremely positive by the participants, with an overall grade of 8,2/10, and in details average grade for online ISP sessions at 8,35/10 and 8,6/10 for on-site sessions.

Despite the adjustments suggested due to minor logistic and organisational issues, which are natural for a program first trial, the participants are all really enthusiastic on the content, activities and organisation offered during this ISP. All the participants underline the pedagogical quality of the programme allowing a multidisciplinary opening in the vast field of the geothermal energy chain, the richness of the programme in the content, with the different aspects developed. All the participants also underlined the importance of launching a Master of Science and Engineering programme along the lines of the ISP in geothermal science, and the majority of them indicated that they would follow such a programme if they had the opportunity to do so.