Report on BIO201 Ecology 2016

Summary
This year we had 28 students signed up for the course, 26 passed. We continued with portfolio assessment, but changed the course structure quite significantly from last year. The learning outcomes were revised in 2015:

1. be able to obtain an overview of modern ecological issues and discussions
2. know how ecological research takes place in the field, in the lab and with data and models
3. use some statistical and numerical methods actively to draw conclusions about ecological processes
4. understand the links between evolution and ecology
5. consider relevant, contemporary and applied ecological issues in light of ecological research
6. have an overview of scientific ecological journals and be able to find and use relevant literature
7. be able write good and independent texts on ecological themes using a scientific language and format
8. be able to create informative and precise illustrations and graphs of data, analyzes and simulations

Obviously, the LO's are biased towards transferable skills, and consequently this year most of the workload was biased towards writing, group projects and problem solving (see attached course description and outline).

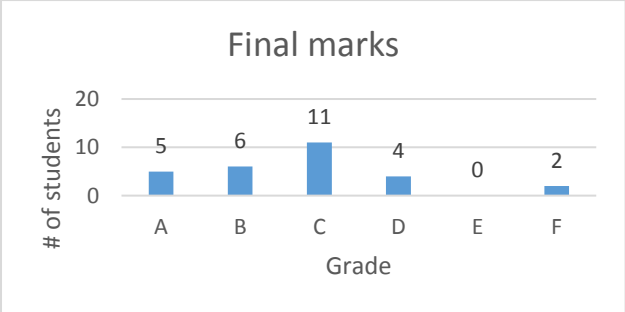


Fig 1. Overview of final grades based on 11 different assessed elements in the portfolio.

Course plan 2016

A detailed overview of course activities, schedules, involved teachers and teaching assistants can be found in Attachment 1, the course outline. The key elements of the assessment were one essay on a chosen topic, 5 assignments based on the textbook, one oral presentation, one peer-review, and three group projects. The group projects involved simulation in NetLogo, statistical analysis in EcoPrimer and some descriptive statistics of a dataset.

We used MittUiB for submission of draft versions, and for commenting back on students assignments. The peer-review function in MittUiB was smooth to use and also, the students were very good at commenting on each other's assignments. MittUiB has a number of functionalities for feedback, grading and alignment of learning activities, assessment and learning outcomes– and we still have to explore the possibilities here.

A stronger focus on feedback was emphasized in 2016 – both on written texts but also on the possibility for direct discussions on assignments. A number of slots for individual discussions on the assignments were available, but the demand for these feedback sessions was low. However, they were efficient in clarifying issues and in our understanding of student perceptions of tasks and assignments.

Student evaluations
The 2016 course was chosen as part of a study on alternative teaching practices in higher education, so students and teachers have been interviewed by a PhD-student in pedagogy from UiO. The results from this is to be published later, but the written feedback from students (50% response rate) is included here (Attachment 2). The form is developed by the researcher and is quite general in its focus, but some general comments are available.
The most frequent comment is that the workload is to large, despite our efforts to scale this to 266 hours of work, exactly the requirement for 10 ECTS (Raaheim 2013, 'råd og tips til deg som underviser', s. 118). It is difficult to estimate the time needed to write assignments, and perhaps it takes more time than normally expected. In particular, it appeared that 'Textbook assignments' took longer than we anticipated.

Teacher evaluations
This was an interesting experiment. We were not quite prepared for 28 students which involved quite a bit of work in commenting and providing feedback. The process of giving feedback is more meaningful when students can submit revised versions based on the comments, and our impression is that the comments and revisions substantially improved the final products. We also realize that giving extensive written feedback on student assignments is an art in itself, striking the balance between positive and critical, diversifying between students etc. Often the same comments are made to a number of students, so feedback may be made more efficient and general.

Another observation from us is the need for training students at this level in finding the scientific literature, and to become more aware of the difference between peer reviewed literature and anything else available on the web. Often students are strongly influenced by news or NGO-perspectives, with little ability to find primary sources or to understand the difference between general googled information and scientific literature. Also, a stronger focus on plagiarism is needed, sometimes students tend to copy-paste or copy-translate from the textbook or from the web.

Our impression is further that the group work functioned well, although it is important to design the group tasks such that they are engaging. We used advise from Michaelsen and Sweet (2008) to form and manage group work. We have little control over workload distribution in the groups, and were pleased to see that none of the students complained over this. This is encouraging as we believe student learning is much improved by working in teams.

A recurring trade-off in our emphasis on transferrable skills, such as writing, modelling and statistics is the lack of time to work on the subject matter in the textbook. At this stage it is important to learn a minimum of terms, concepts, basic theory, and a textbook is essential to obtain this goal. We have had difficulties in developing these elements within our portfolio assessment model. In 2016 we tried five 'Textbook assignments' – which made students read the book and write an essay on some selected topics. It is difficult to assess exactly how students worked with these and the textbook, and it did not solve the issue of how to make lectures or classtime based on the textbook relevant to these assignments (as also pointed out in the student evaluation form). This is not the classical conflict between 'coverage' - 'the enemy of understanding' (Biggs & Tang 2011) - and more reflective, deeper engagement strategies, since much of the textbook material need not be covered. But in a first course we are now maybe tilting to much to the generic skills side rather than to content knowledge, moving too far up Biggs' SOLO taxonomy, too early? A substantial fraction of the students was struggling with ecological concepts and had little or no background in ecology before the course.

The workload involved in providing feedback including revisions of 11 portfolio assessment items for 28 students is quite large. If classes remain of this size, we need to reduce the number of items and interactions.

Changes for 2017

- 2016 had a strong emphasis on developing transferable skills and critical thinking among the students. We see a need to increase our emphasis on more declarative content knowledge, improve the relevance of the textbook and lectures. Also, we need to reduce our workload in case the student number increase even further. We also see many valuable elements in our design: group work, problem solving, writing with feedback and peer review.
- We have rewritten the Learning Outcomes to reflect this shift.
- Introduce a written exam (60% of final grade) on all elements of the course, while keeping some time for group tasks and assignments (40% of final grade).
- Introduce a new textbook ('Elements of Ecology'), select a limited number of chapters from it, and develop learning activities relevant to the exam.
- Keep group projects, one individual written assignment and peer-review activity.

Revised LO:

After the course students can

- describe and explain basic ecological theories, concepts and models
- use and summarize ecological methods used in field, lab and modelling
- apply some statistical and numerical methods actively to analyse ecological processes
- identify and explain links between evolution, ecological adaptations and ecosystem functioning
- discuss relevant, contemporary and applied ecological issues in light of ecological theory
- write independent texts on ecological themes using a scholarly language and format
- construct precise illustrations and graphs of data, theories and simulations and draw conclusions from them

References

Biggs J, Tang C (2011) Teaching for Quality Learning at University. Open University Press

Michaelsen LK, Sweet M (2008) The essential elements of team-based learning. New Directions for Teaching and Learning 2008:7-27

Attachments

1) Course outline
2) Student evaluations

Attachment 1) BIO 201 Ecology Spring 2016 – course Outline

Aim and content:

This course provides an introduction to basic ecological theory on individual, population and community levels. Life history theory, population growth, competition, predator-prey, parasitism, diversity, successions, species compositions, distributions in time and space, metapopulations- and community ecology are important topics for the course. A primary goal is to develop students' ability to think scientifically and to use the scientific literature to elucidate ecological questions. There is strong emphasis on quantitative analysis and writing. The course aims to establish a solid basis in ecological theory and demonstrate the social

relevance of ecology, including harvesting of natural resources and management of ecosystem functions and services. The course will use examples from plants, animals and microorganisms in both terrestrial and aquatic systems..

Learning outcomes:
After completing the course the student should:

- be able to obtain an overview of modern ecological issues and discussions
- know how ecological research takes place in the field, in the lab and with data and models
- use some statistical and numerical methods actively to draw conclusions about ecological processes
- understand the links between evolution and ecology
- consider relevant, contemporary and applied ecological issues in light of ecological research
- have an overview of scientific ecological journals and be able to find and use relevant literature
- be able write good and independent texts on ecological themes using a scientific language and format
- be able to create informative and precise illustrations and graphs of data, analyzes and simulations

First meeting: Tuesday 19th of January, 12:15 in room K3, Biologen, Thormøhlensgt. 53B, ground floor, B-block (to the right after main entrance).

Mitt.uib: We will use UiB's new learning platform in the course.

Lectures: 12:15-14:00 Tuesdays and 14:15-16:00 Wednesdays – in room K3, Biologen. (19.01 – 13.04). See detailed schedule below – and note that all the lecture times in the calendar in MittUiB are not used – it is this plan here that is used. There are not many traditional lectures in the course, and many of them are exchanged with individual discussion sessions.

Computer lab: about 10 hours in total, including tutorials in modelling and statistics.

Teachers: Øyvind Fiksen (course leader), Ørjan Totland, Anders Hobæk, Anders Opdal og Adele Mennerat.

Assessment: Portfolio assessment – details below.

Required reading: we use the textbook '**Essentials of Ecology**' (Begon, Howarth and Townsend 4th ed., 2014). This book is relatively easy to read and provides an overview and introduction to modern ecology. The textbook is also available as an e-book, which can be bought (or rented) here. The book is for sale at e.g. Akademika. The book is a resource for the assignments – a key resource for all assignments and also the basis for 5 shorter texts for each of the sections in the book. We estimate you read about 5 pages per hour in the book.

Workload

266 hours is the standard workload for 10 ECTS. The total workload is divided into a series of learning activities, each involving an estimated number of hours of work. The grading weight to each group of activity is equal to the number of hours of work in it.

Learning acivity	*#*	*Time factor*	*Hours*	*Grading weight*
Lectures, class meetings	16.0	1.0	16.0	
Tutorials	8.0	1.0	8.0	
Presentations	1.0	5.0	5.0	3.4%
Assignment long project	1.0	40.0	40.0	27.6%
Assignments, projects	3.0	20.0	60.0	41.4%
Reading the book	440.0	0.2	88.0	
Individual feedback/discussions	8.0	0.5	4.0	
Peer review	1.0	5.0	5.0	3.4%
Portfolio reflections	1.0	0.0	0.0	0.0%
Assignments based on textbook	5.0	7.0	35.0	24.1%
In total			**261.0**	**100.0%**

Learning activities

Lectures and tutorials: There will be a few lectures and tutorials in the course, not many, but possibilities for on-demand lecturing or tutorials if needed. Some videos, mainly explaining how to use software relevant to the exercises and the assignments, are also available from bio@STATs or will be developed during the course.

Computer lab: Some of the tasks include modelling or statistical data analysis, and one of the programs you will use (Primer) requires a license, and the program will be available on a set of computers in a computerlab at Høyteknologisenteret, Room 1128 (HIB:FLAB3). Some assignments will use NetLogo, an open source program for simulating ecological processes from the individual level.

Assignments and assessment: The assessment method in this course is based on a portfolio of items (artefacts) you produce during the course. Five of them are shorter tasks based on the textbook, three are specific projects and assignments, one is a chosen project including an oral presentation, another is a peer review of someone else's project, and the last is a reflective piece on the portfolio and the elements in it. All of these are evaluated. The given projects will be group projects – groups will be predefined by the instructors and remain fixed during the course.

Feedback dialogues: An important element of the course is a continuous dialogue between students and teachers on the portfolio development. Each student will be entitled to one-to-one feedback and discussion over portfolio items, finding a relevant theme for chosen topic and on strategies for learning about the science of ecology. This can take several forms, written comments in texts, direct communications or over e.g. Skype if needed. Meeting times will be developed in Mitt UiB. We will set up a meeting point for this, mainly within the time frame of the lectures on Tuesdays and Wednesdays, but other times may also be possible.

Portfolio assessment

Students submit a range of items throughout the course: assignments, a presentation, peer review and a text reflecting on the portfolio and the learning outcomes. The final grade A-F is based only on the final portfolio, not on any intermediate products. Student submit draft items along the way, and receive specific feedback on each item. Written comments, oral feedback

and discussions on development or challenges of the portfolio are essential elements in the course. The assessment criteria are linked to an evaluation of how well the learning outcomes have been achieved, and more specific details for the assessment criteria will be given for each activity.

One of the core academic values is to give credits to your sources and earlier work, and to be able to separate own contributions from others. All elements in the portfolio is checked for plagiarism using Ephorus.

Workplan Spring 2016:

Date	Teacher	Learning activity and themes	Format
T 19.01	ØF	Introduction. Learning outcomes. Schedule. Background and expectations.	L
W 20.01	ØF	Ecological journals and literature. Finding a question for the open assignment. Tools.	T
T 26.01		First individual feedback session: the open assignment.	IF
W 27.01		No teaching	
T 02.02	ØF	Textbook assignments (TA1) presented Feedback on open assignment	T/IF
W 03.02	ØF	Ecological methods/TA2 and TA3 presented	L
T 09.02	ØF	Individual feedback and approval of open assignment task – finding a theme	IF
W 10.02	ØF/AFO	Task 1. Predator – prey interactions. Theory.	L
W 10.02		Approval of theme for open assignment	Deadline
T 16.02	AFO	Tutorial for group assignment	T
W 17.02	AFO/ØF	Tutorial for group assignment	T
T 23.02	ØF	Evolutionary ecology	L
W 24.02	ØF	Applied ecology	L
T 01.03	ØT	Task 2. Ecosystem services. Theory.	L
T 01.03		Submission of TA1-draft for feedback	Deadline
W 02.03	ØT	Tutorial for group assignment Presentation of TA4	T
W 02.03		Submission of draft Task 1 project	Deadline
T 08.03	ØF	Feedback TA1	IF
W 09.03	AFO	Feedback Task 1	IF
T 15.03	ØF	Oral presentations open project	
W 16.03	ØF	Oral presentations open project	

		Submission of TA2 & 3 drafts for feedback Submission of draft Task 2 project	Deadline
		Easter and winter holidays	
T 05.04	AH/AM	Task 3. Biodiversity. Data analysis. Theory. Presentation of TA5	L
W 06.04	ØT	Submission of TA4 drafts for feedback	Deadline
T 12.04	ØT	Ecosystem services. Feedback session Task 2 & TA4	L/IF
W 13.04		Feedback session Task 2 & TA4 cont.	IF
T 19.04	AH/AM	Tutorial. Computer lab. EcoPrimer. Doubled due to space-limits in the lab.	T
W 20.04	AH/AM	Computer lab. EcoPrimer. Doubled.	T
T 26.04	AH/AM	Computer lab. EcoPrimer. Doubled.	
W 27.04		Peer review of open assignment	Deadline
W 04.05		Submission of draft Task 3 project Submission of TA5 draft for feedback	Deadline
W 11.05	AH/AM	Feedback session Task 3 & TA5	IF
T 14.06	ØF	Final date to submit all portfolio items	
24.06		Final grades ready	

L: Lectures; T:Tutorials; IF: Individual Feedback sessions
TA: Textbook Assignment (5 in total)

Descriptive report of BIO201 student survey

- **Total responses: 13 (out of 26 students); 50% response rate**
- **First invitation sent out: 7.6.2016**
- **Closed on 1.8.201, more than two weeks after last response**

Contents

What type of programme are you enrolled in?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor	7	53,8	53,8	53,8
	Master	5	38,5	38,5	92,3
	Other	1	7,7	7,7	100,0
	Total	13	100,0	100,0	

What gender do you identify with?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	12	92,3	92,3	92,3
	Male	1	7,7	7,7	100,0
	Total	13	100,0	100,0	

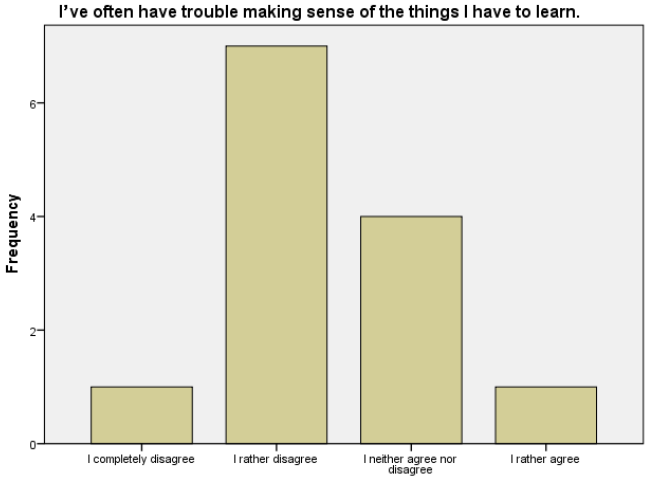
How old are you?

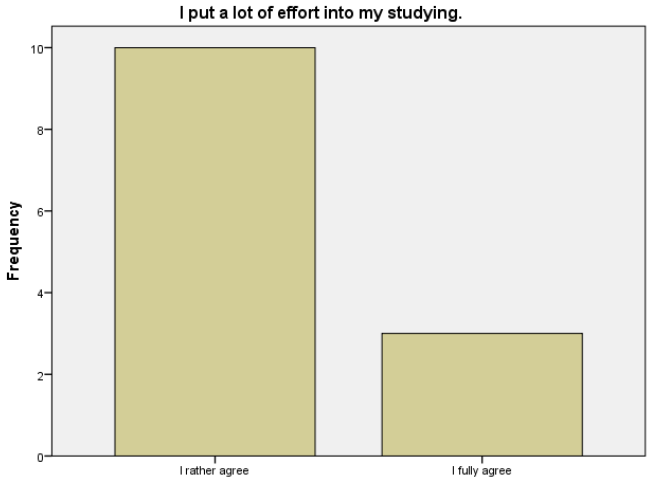
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-22	9	69,2	69,2	69,2
	23-30	4	30,8	30,8	100,0
	Total	13	100,0	100,0	

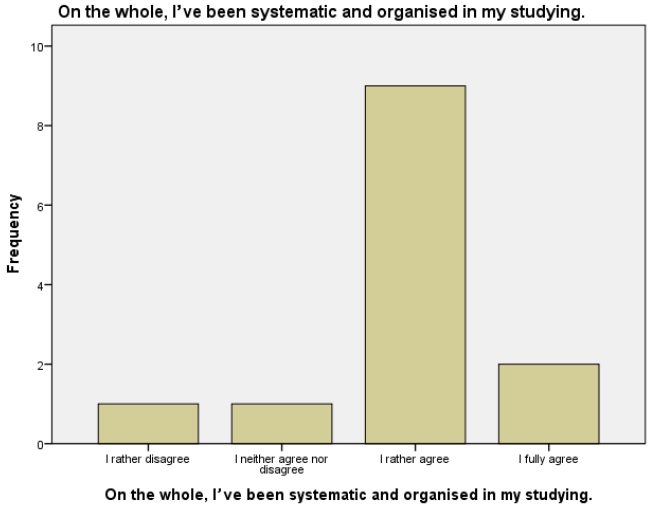
How many terms (semesters) have you been enrolled in higher education?

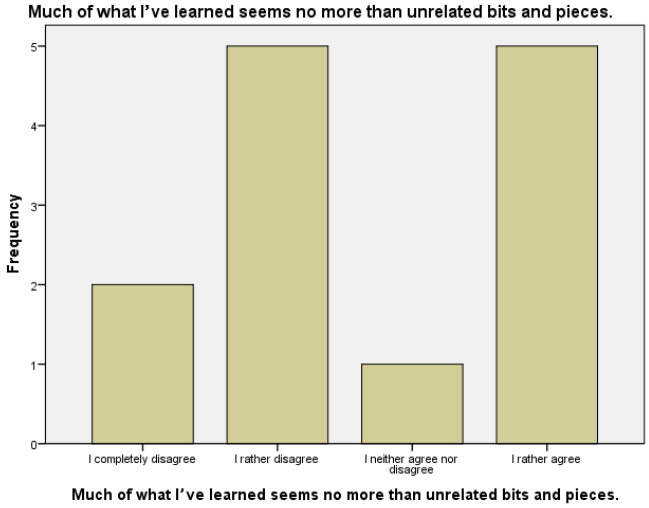
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6	6	46,2	46,2	46,2
	7	1	7,7	7,7	53,8
	8	3	23,1	23,1	76,9
	9	2	15,4	15,4	92,3
	13	1	7,7	7,7	100,0
	Total	13	100,0	100,0	

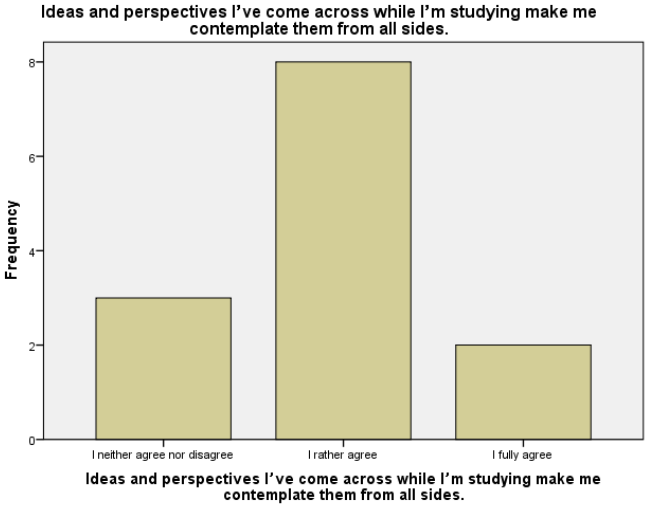
SAL – Student Approaches to Learning (12 Items)

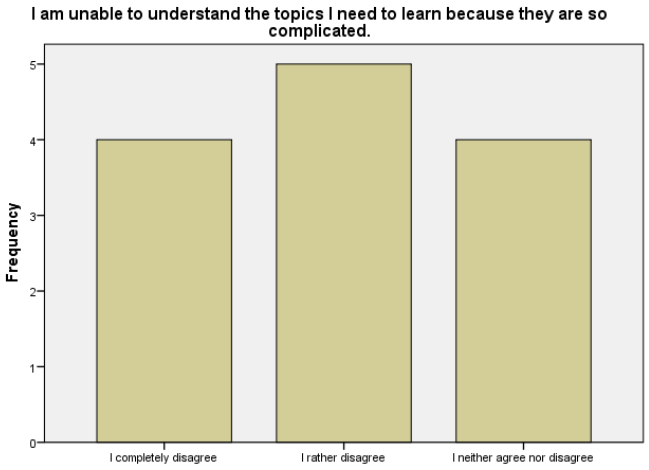


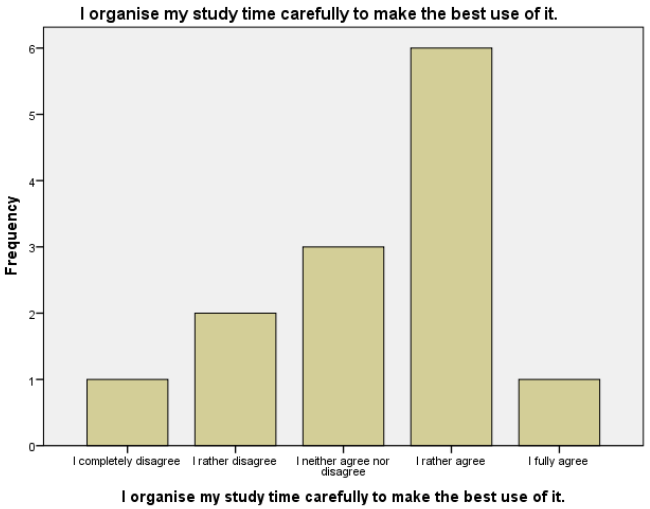


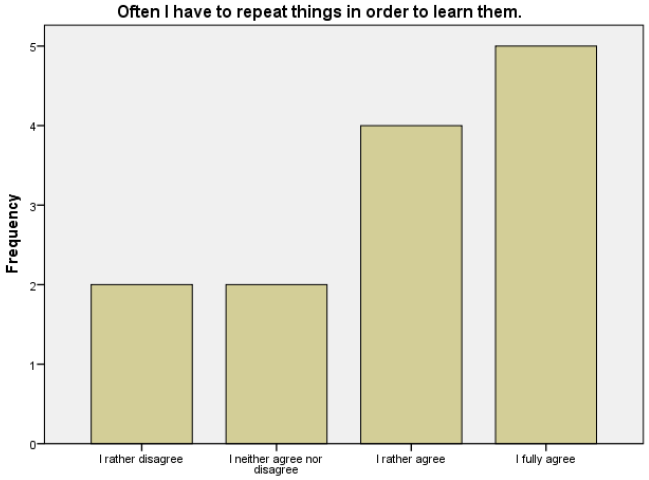


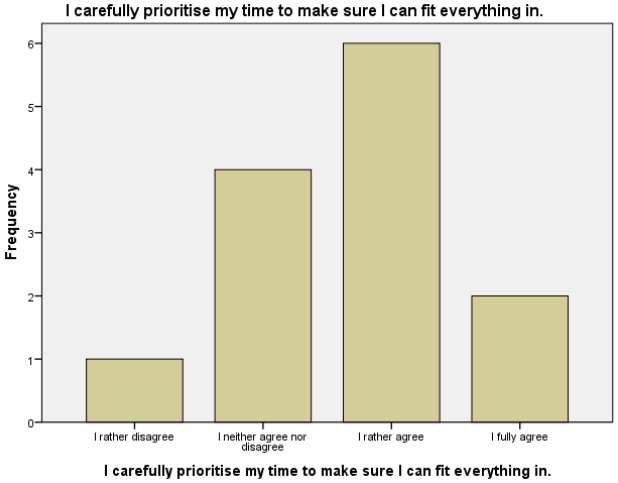


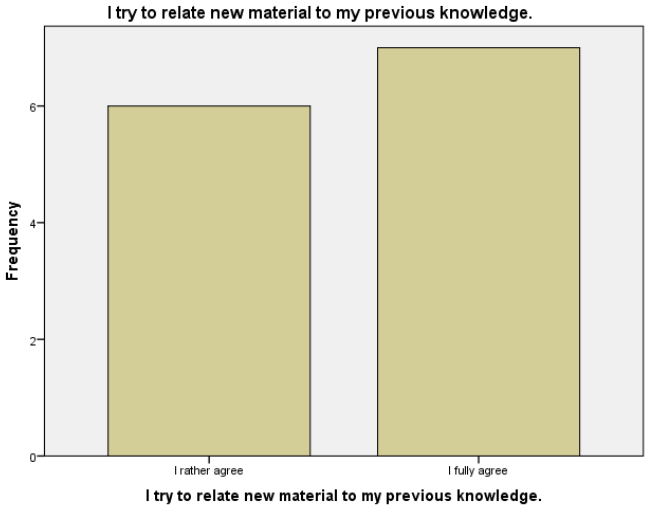



I am unable to understand the topics I need to learn because they are so complicated.
Frequency
0
1
2
3
4
5
I completely disagree
I rather disagree
I neither agree nor disagree
I am unable to understand the topics I need to learn because they are so complicated.


I organise my study time carefully to make the best use of it.
Frequency
0
1
2
3
4
5
6
I completely disagree
I rather disagree
I neither agree nor disagree
I rather agree
I fully agree
I organise my study time carefully to make the best use of it.


Often I have to repeat things in order to learn them.
Frequency
0
1
2
3
4
5
I rather disagree
I neither agree nor disagree
I rather agree
I fully agree
Often I have to repeat things in order to learn them.


I carefully prioritise my time to make sure I can fit everything in.
Frequency
0
1
2
3
4
5
6
I rather disagree
I neither agree nor disagree
I rather agree
I fully agree
I carefully prioritise my time to make sure I can fit everything in.


I try to relate new material to my previous knowledge.
Frequency
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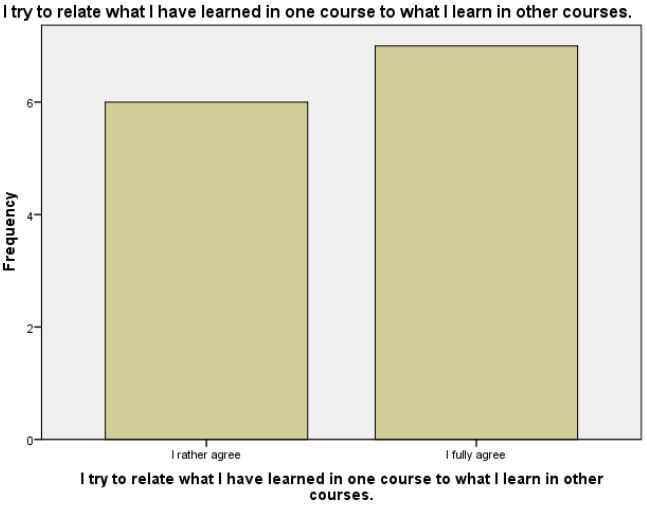
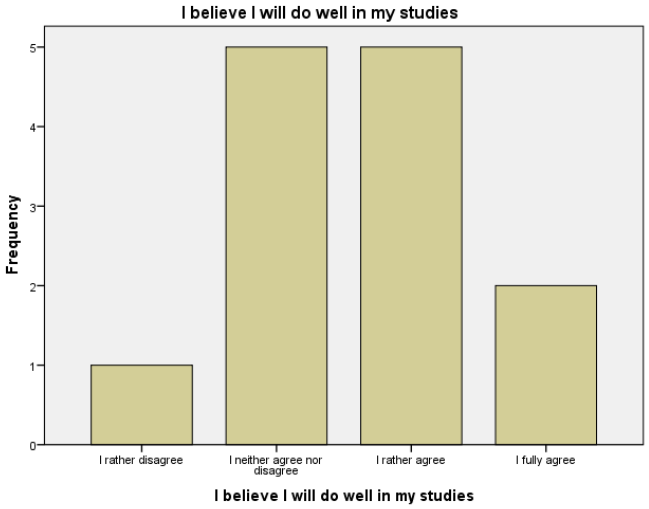
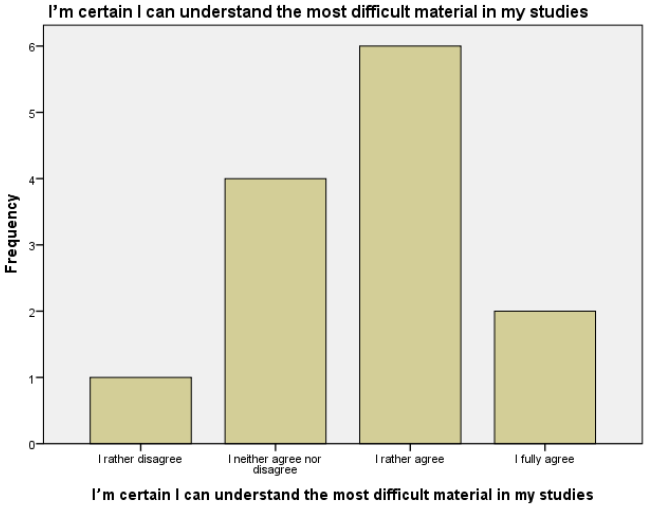
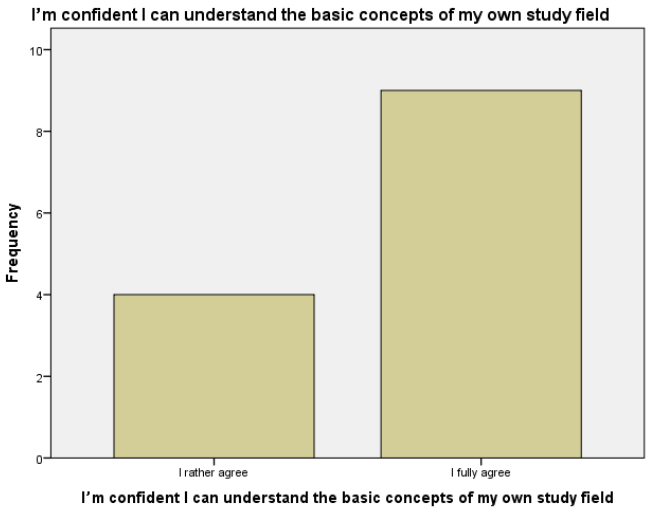
2
4
6
I rather agree
I fully agree
I try to relate new material to my previous knowledge.

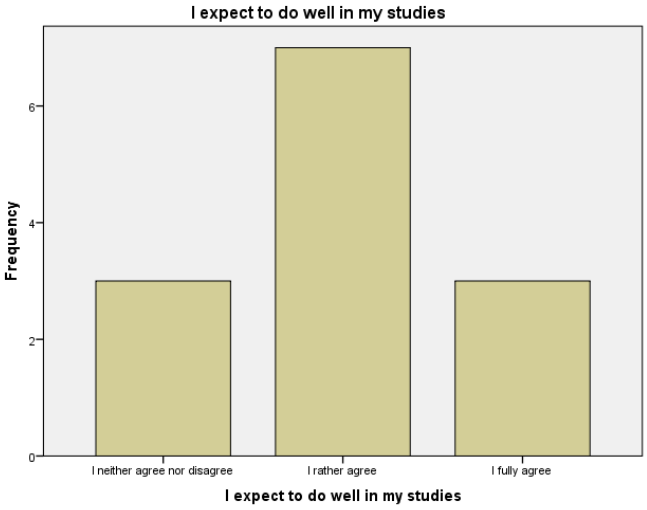

I try to relate what I have learned in one course to what I learn in other courses.
Frequency
0
2
4
6
I rather agree
I fully agree
I try to relate what I have learned in one course to what I learn in other courses.

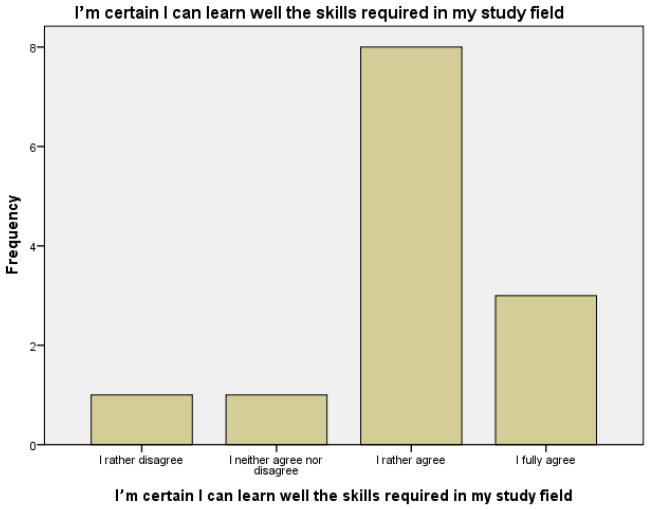
SE – Student Self-efficacy (5 Items)



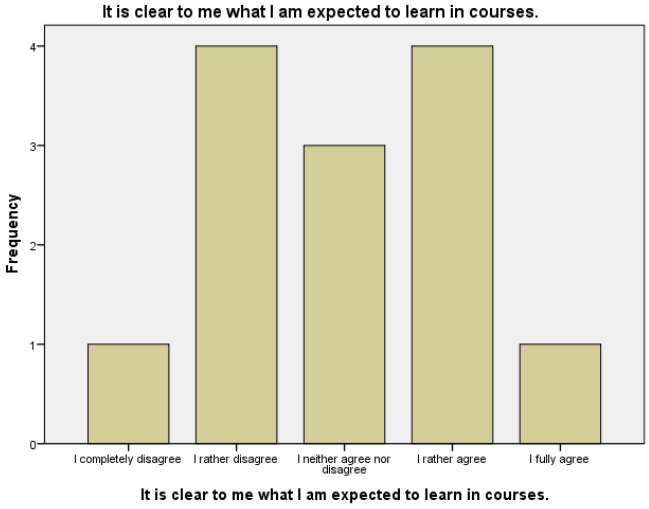


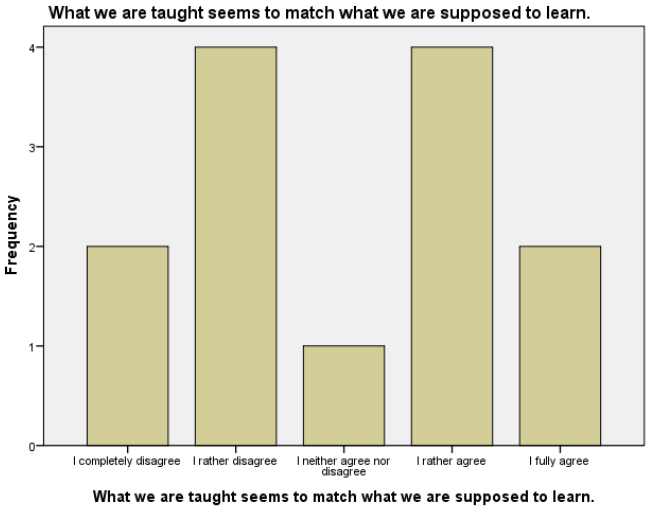


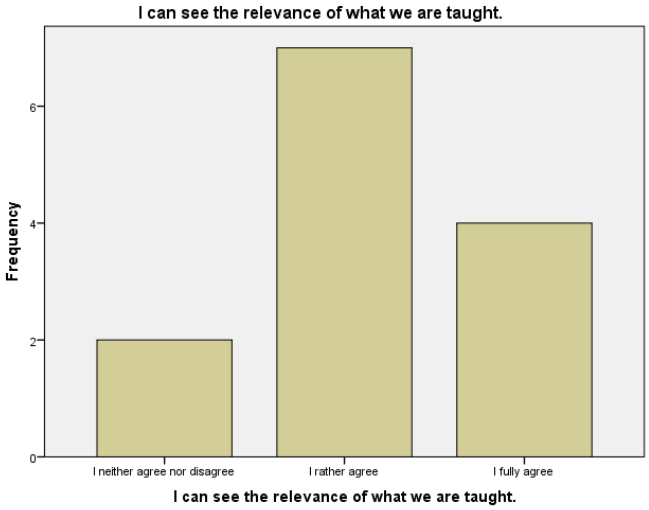


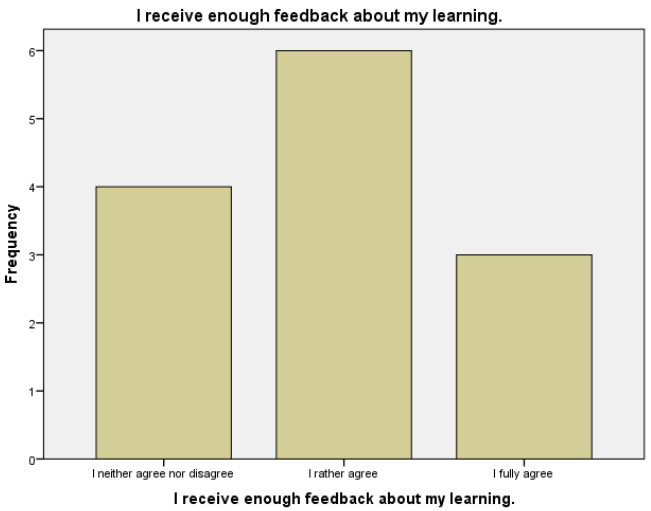


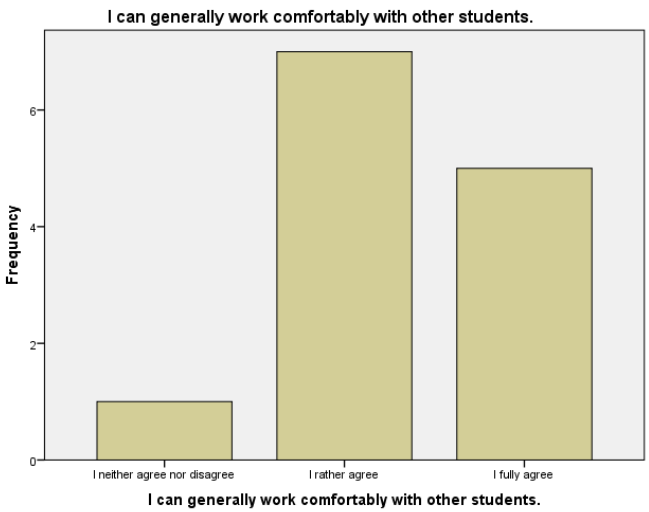
TLE – Teaching and Learning Environment (14 Items)

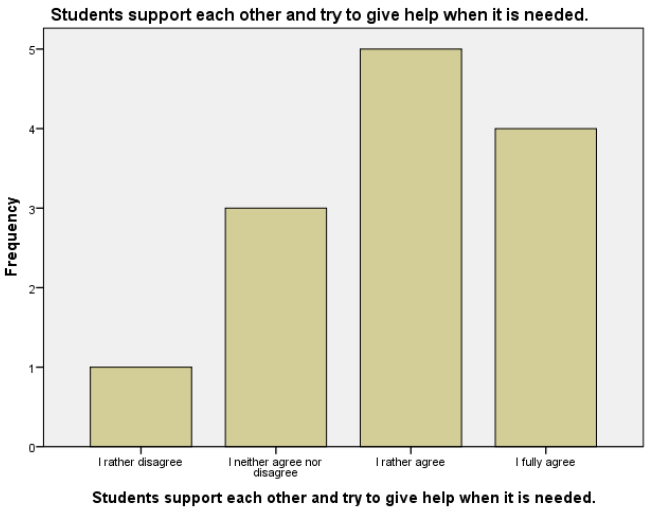


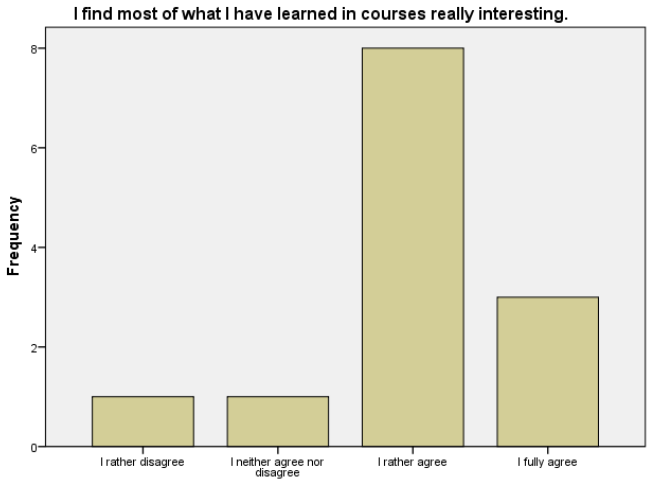




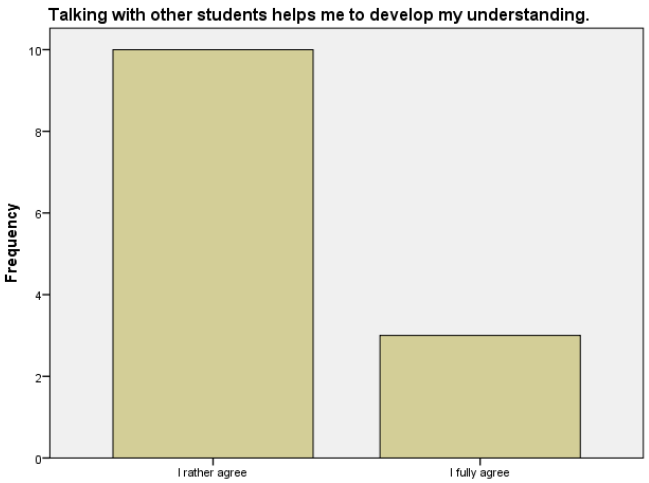




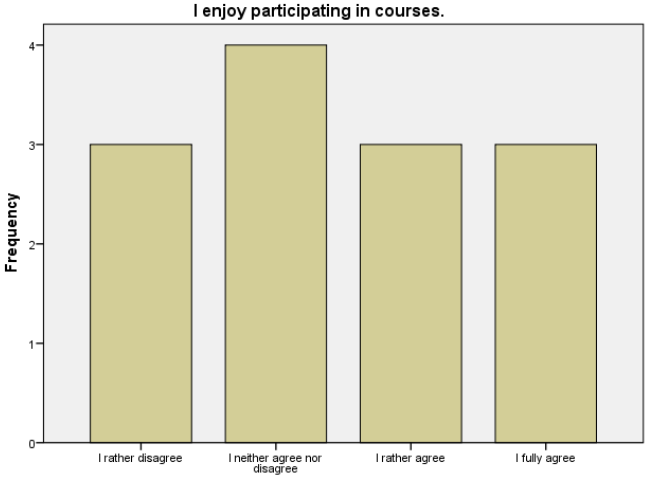




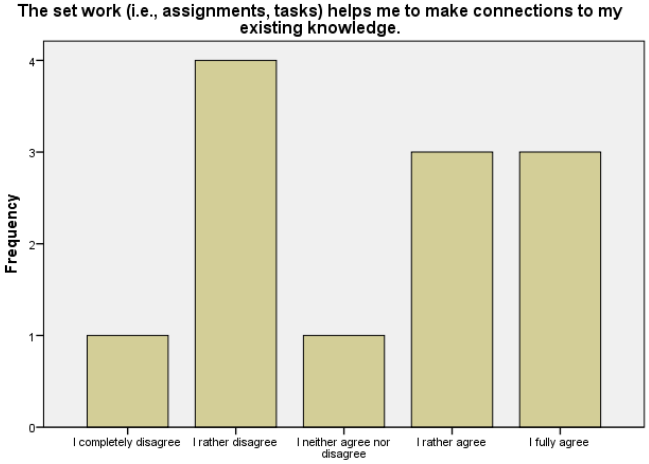
I find most of what I have learned in courses really interesting.



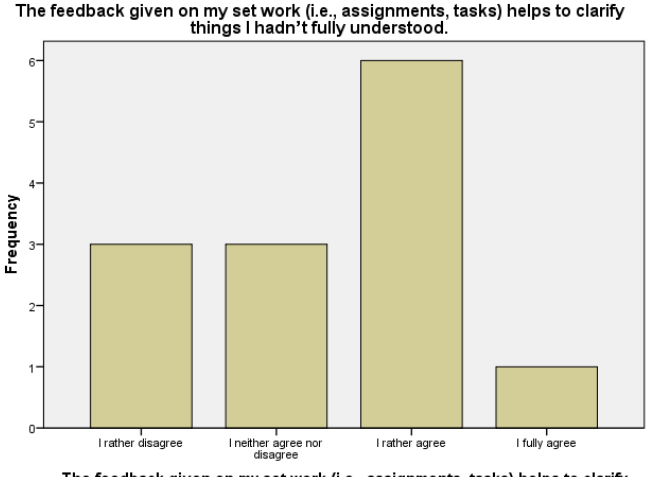
Talking with other students helps me to develop my understanding.



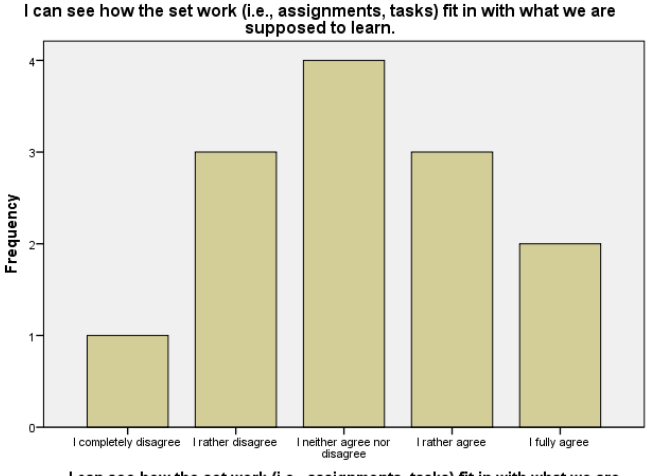
I enjoy participating in courses.



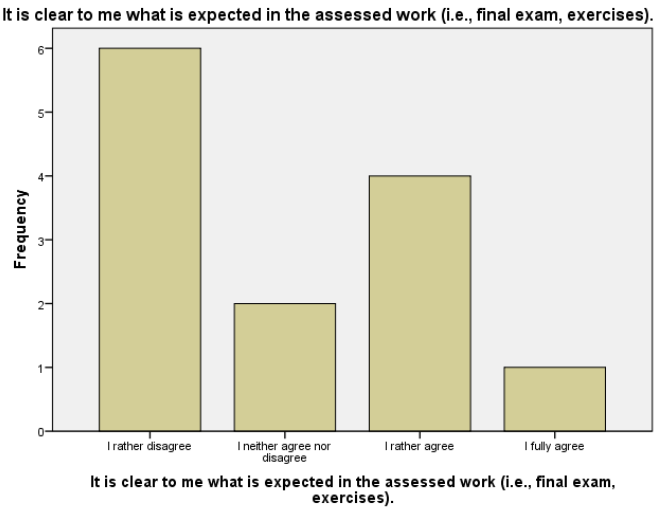
The set work (i.e., assignments, tasks) helps me to make connections to my existing knowledge.

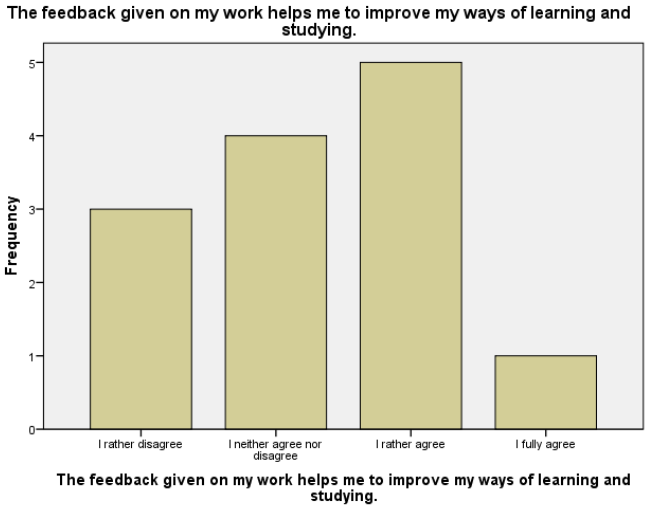


The feedback given on my set work (i.e., assignments, tasks) helps to clarify things I hadn't fully understood.

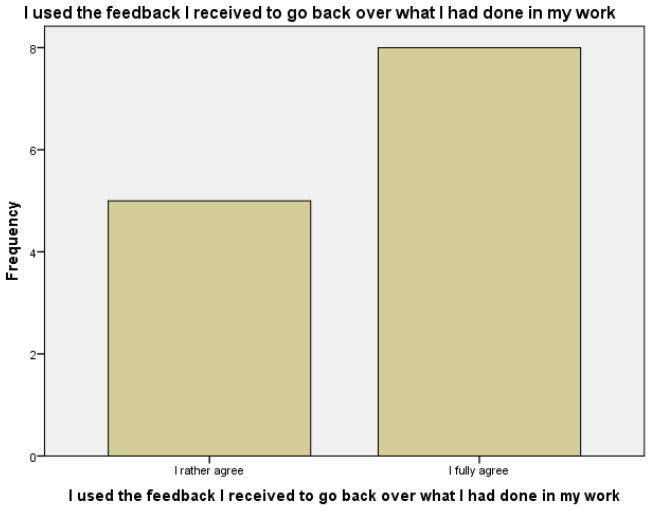


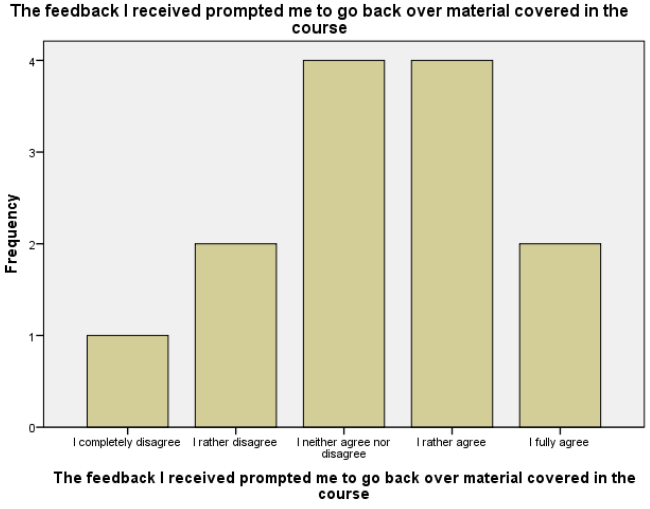
I can see how the set work (i.e., assignments, tasks) fit in with what we are supposed to learn.

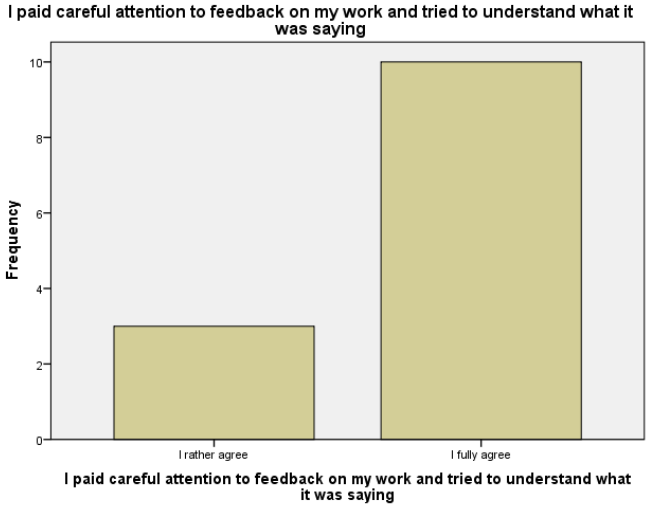




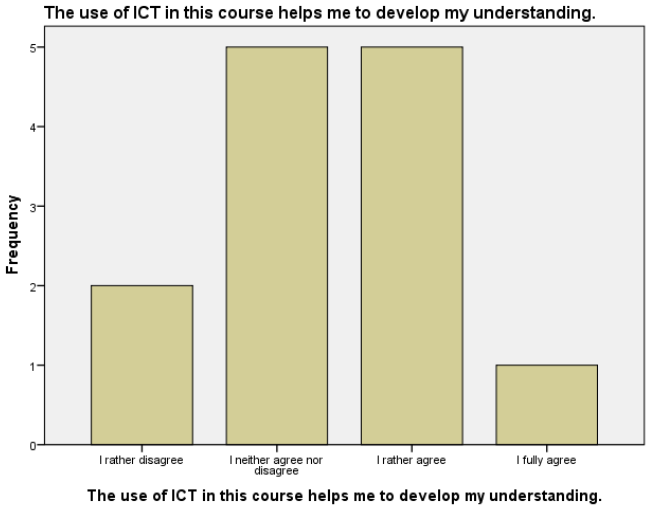
AEQ – Assessment Experience Questionnaire (3 Items)

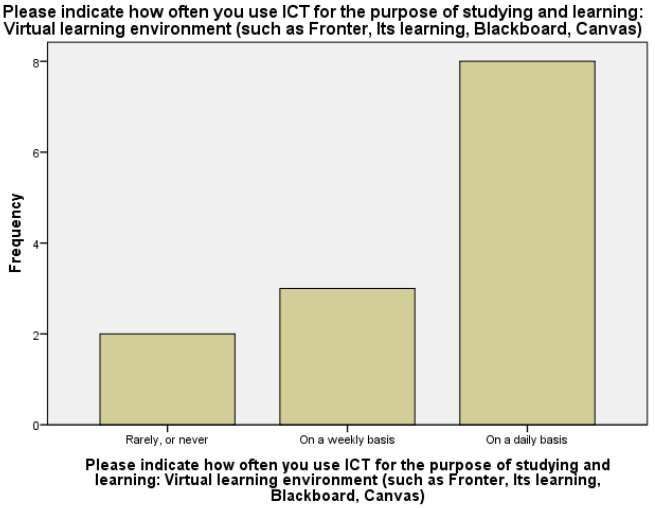


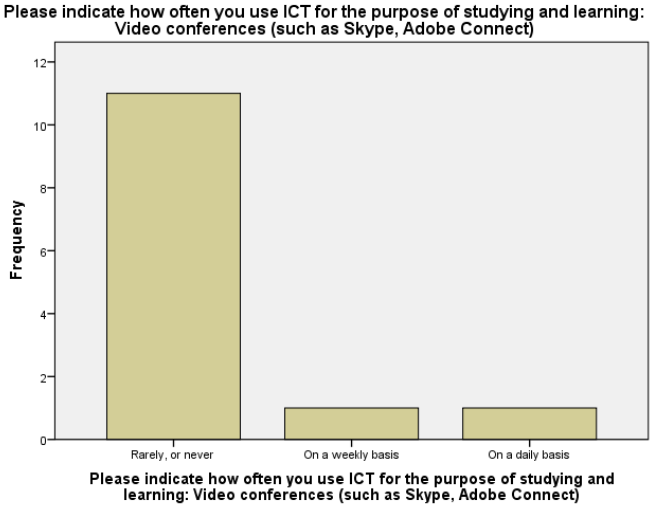


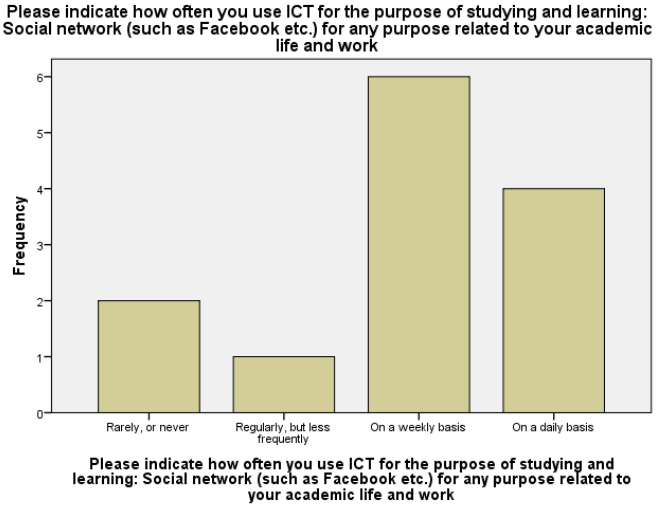


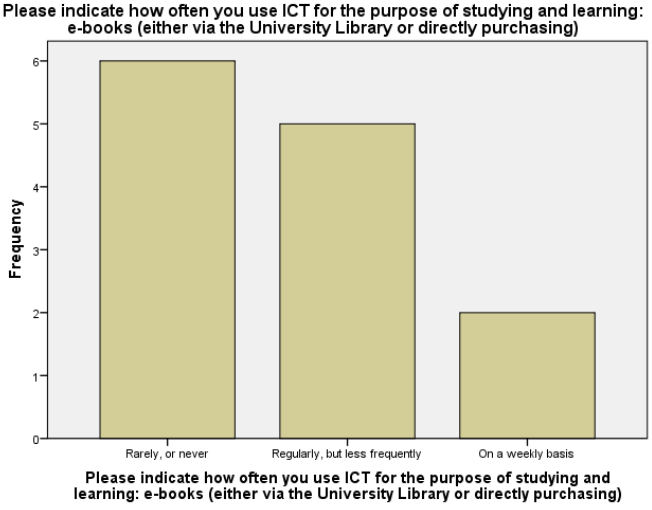
ICT – Information & Communication Technology in the Classroom (10 Items)

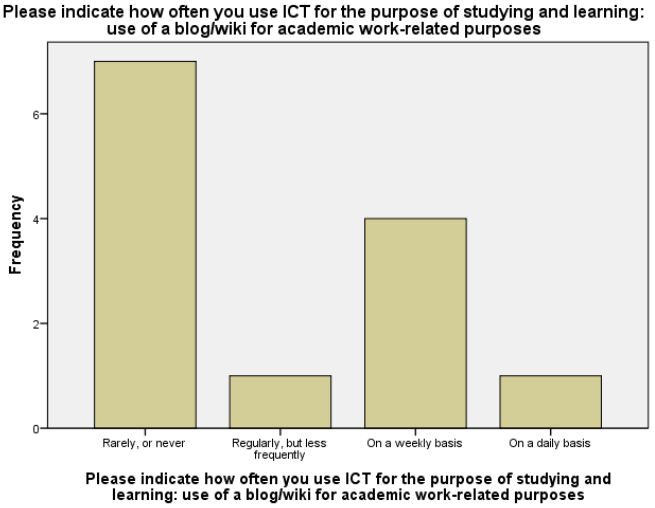


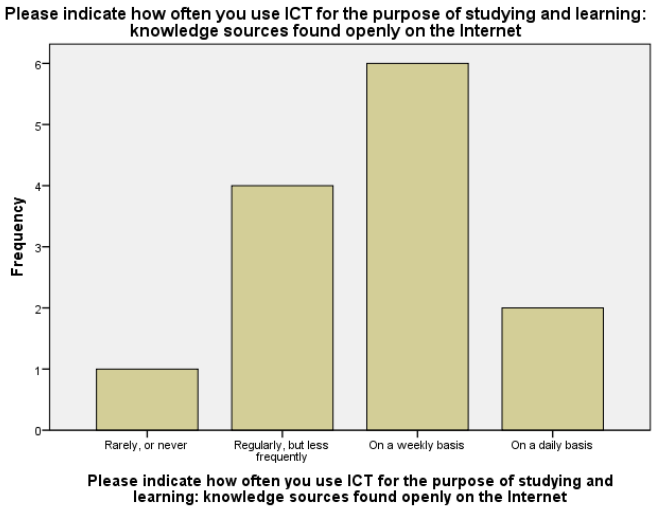


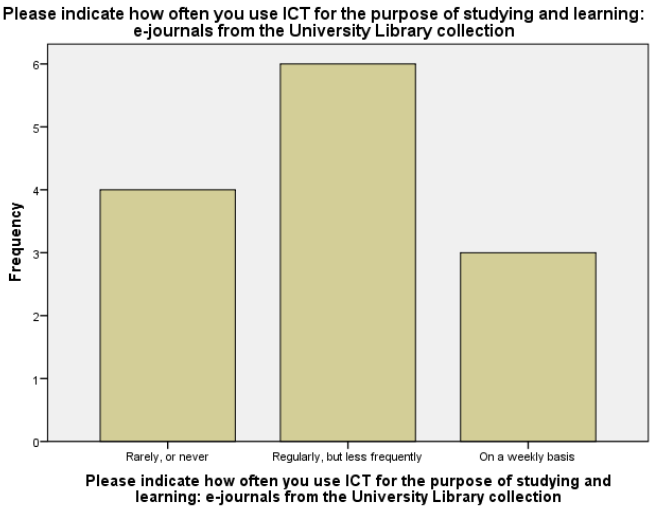


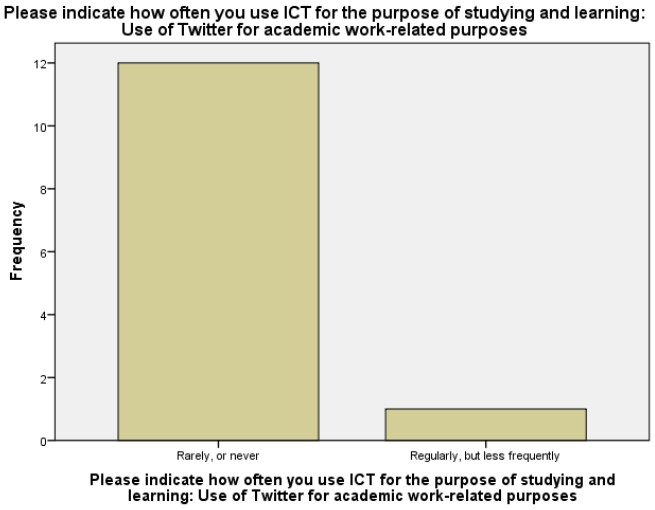


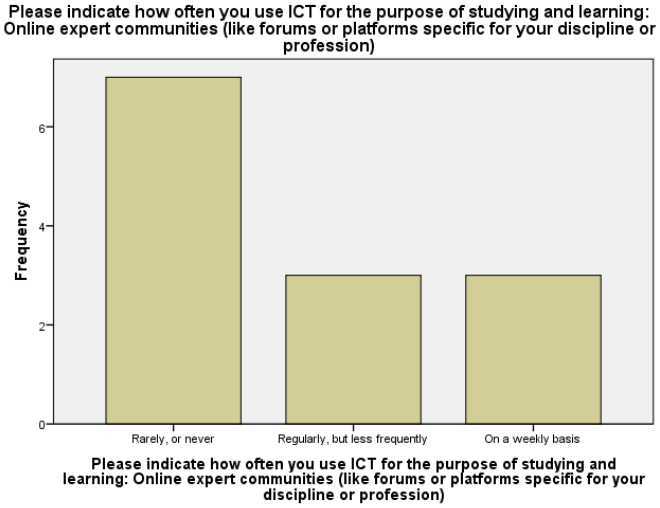




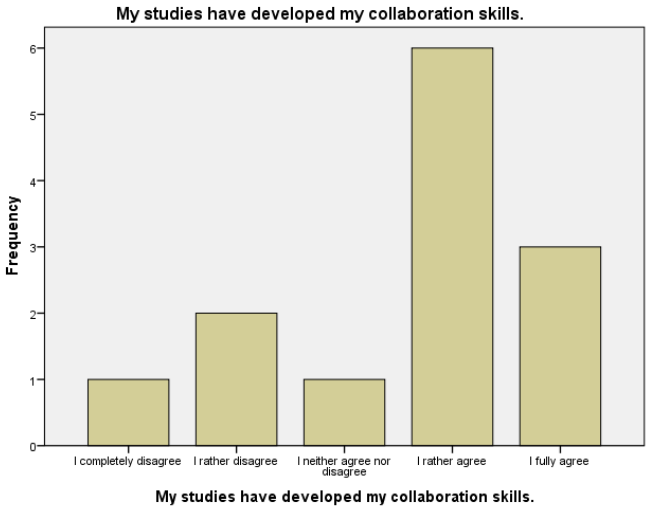

Please indicate how often you use ICT for the purpose of studying and learning: knowledge sources found openly on the Internet
Frequency
0
1
2
3
4
5
6
Rarely, or never
Regularly, but less frequently
On a weekly basis
On a daily basis
Please indicate how often you use ICT for the purpose of studying and learning: knowledge sources found openly on the Internet

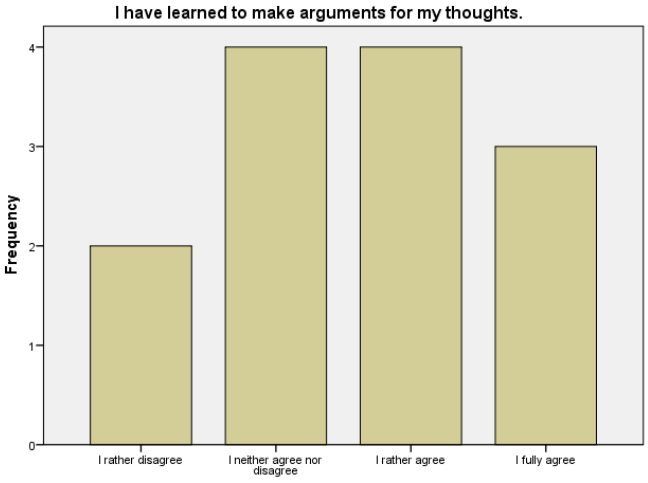

Please indicate how often you use ICT for the purpose of studying and learning: e-journals from the University Library collection
Frequency
0
1
2
3
4
5
6
Rarely, or never
Regularly, but less frequently
On a weekly basis
Please indicate how often you use ICT for the purpose of studying and learning: e-journals from the University Library collection

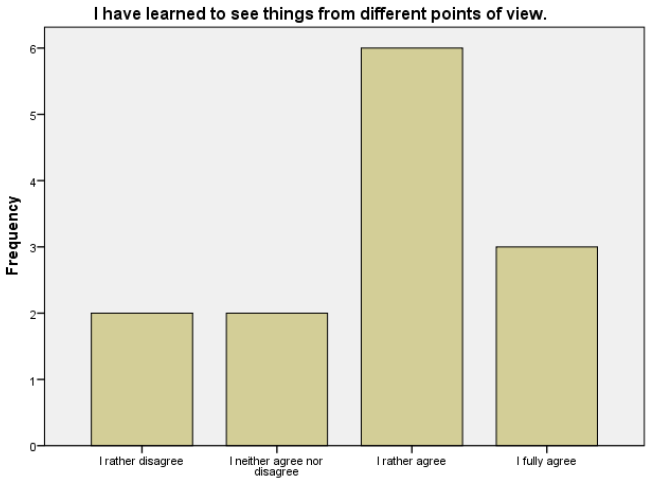

Please indicate how often you use ICT for the purpose of studying and learning: Use of Twitter for academic work-related purposes
Frequency
0
2
4
6
8
10
12
Rarely, or never
Regularly, but less frequently
Please indicate how often you use ICT for the purpose of studying and learning: Use of Twitter for academic work-related purposes

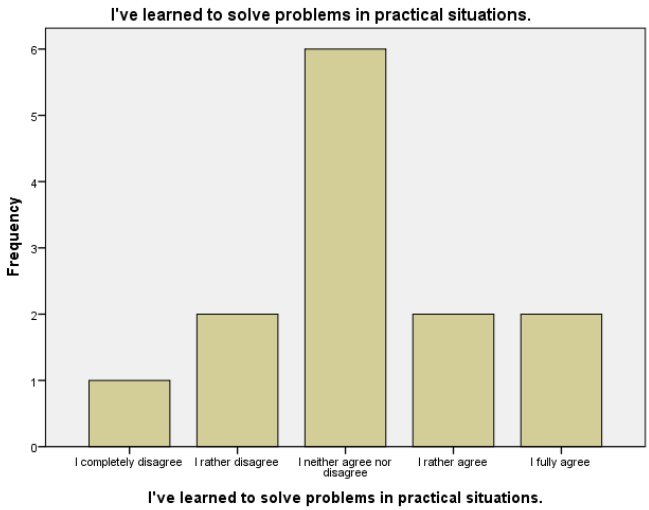

Please indicate how often you use ICT for the purpose of studying and learning: Online expert communities (like forums or platforms specific for your discipline or profession)
Frequency
0
2
4
6
Rarely, or never
Regularly, but less frequently
On a weekly basis
Please indicate how often you use ICT for the purpose of studying and learning: Online expert communities (like forums or platforms specific for your discipline or profession)

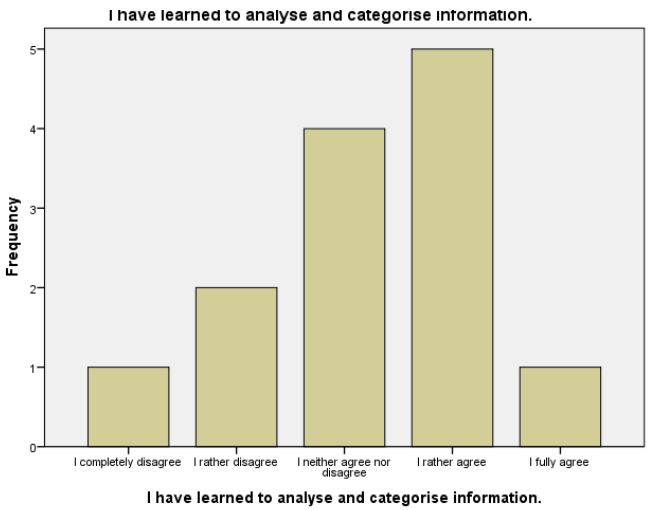
COM – General Competencies (8 Items)

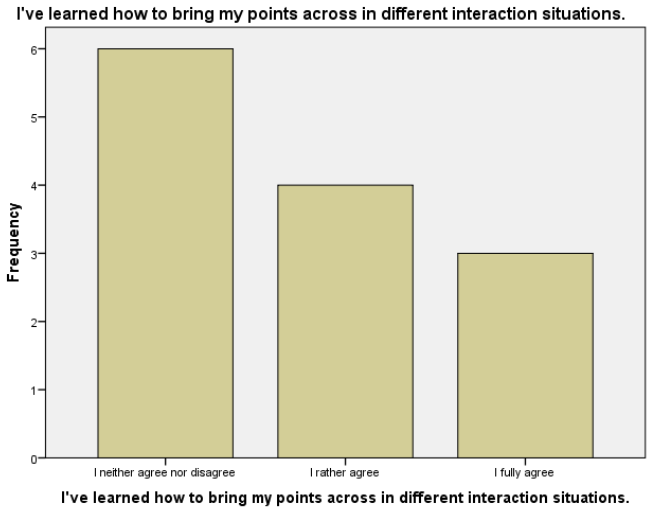












Open question: What did you like most about this course?

- Oppgaveskriving
- At det var innleveringer.
- Gruppearbeider, og ubderveisvurdering av gjort arbeid
- Pensumet er interessant
- Tett og individuell oppfølging fra professor
- Mulig å få tilbakemeldinger, klare kompetansemål for det store prosjektet,
- Tilbakemeldingene, og muligheten for å få dette
- Tilbakemeldingene
- Lærerikt emne.
- Muligheten til å endre arbeid etter tilbakemelding
- Engasjerande
- The open assignment
- Group Tasks

Open question: What do you think could be improved in this course?

- At kravene stemmer med studiepoengene. Foreløbig altfor mange arbeidskrav
- Arbeidsmengden bør gå ned. Bedre oversikt
- Alt for mye arbeid på et 10 stp fag. Det går ikke an å forvente at vi er verdensmestere i å bruke flett nye program (tenker på TASK 3) og dømme oppgaven deretter. Oppgaveskriving og arbeid generelt krever mer tid enn hva som antas i forkant av faget.
- Undervisningsmetoden
- Jeg syntes det var en utfordring med gruppeoppgaver da jeg er i fulltidsjobb.

- Kanskje ha tidligere frister, og ikke ha fristene for alle oppgavene samtidig. Slutten av semesteret har vært utrolig stressende, og det er vanskelig å ikke ha innleveringene i bakhodet før de leveres for godt. Altfor mange vurderinger/innleveringer. En tekst på rundt 1000 ord teller kun 4% av karakteren, som er mindre enn et flervalgsspørsmål på en eksamen. Noen av forelesningene er helt unødvendige siden vi ikke jobber med stoffet fra dem, noen av tilbakemeldingene er vage. Gruppeoppgave 3 er altfor krevende sammenlignet med de to andre, og skjønner ikke helt læringsutbyttet med den oppgaven. Tekstbokoppgavene kan gjerne kuttes vekk og bli erstattet med en mulig midtsemestereksamen.
- Det var vanskelig å velge et tema til åpen oppgave, kanskje det hadde vært fint å få litt mer hjelp til det?
- Forelesning i samsvar med oppgaver. Virket usammenhengende for meg
- Tekstbokoppgavene var vanskelige å tolke til tider, i tillegg var det ofte vanskelig å finne nøyaktig hva foreleser ville vi skulle finne i boken. Dette siden det skulle brukes konkrete eksempler derfra som foreleser (mer eller mindre?) hadde sett ut på forhånd, og mange ord ikke sto i registeret. Det var rett og slett håpløst å finne frem til det som var mest relevant innen alle emnene i boken, mye fordi hver eneste oppgave var spredt i forskjellige kapitler. Siden boken skal brukes konkret på den måten, burde det blitt anbefalt å kjøpe online-versjonen av boken ved studiestart istedenfor papir-utgave, slik at det hadde gått an å søke etter det man trenger å lese om.
- Redusere arbeidsmengden og være klar på hva det spørres etter
- Professoren kan bli betre til å stå på sitt og ikkje la negative studenter øydeleggje.
- The feedbacks and Textbook assignment subjects
- More regular lectures