EduCo Semester Documentation

Semester 4 - 2015/2016

An incomplete, unformatted and therefore preliminary version (Oct 27th, 2016)

Introduction

This EduCo semester documentation consists of the evaluations of the courses, the project and the semester as a whole. All the evaluations have a similar structure: first, a short summary of the course/project/semester is given, followed by a discussion based on the results of the [EduCo semester survey](#) - which is based on the "[EduCo criteria](#)". In this discussion, the strengths and weaknesses of a course/project/semester will be pointed out. Then, solutions to these problems are suggested and in the last section the agreements that were made with the teacher/coordinator are described.

Semester

created by: Valerie Lapp
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year/semester: Semester 4, 2016, class of 2017
semester coordinators: Wessel Wits

Summary of the semester

The semester's theme was "Complex Spatio-temporal Systems", the project was split into two parts: during the first part the students had to map and model a complex system, during the second part they had to mitigate one of the problems they had analyzed during the first half. The courses in the engineering domain were Systems Thinking (1 EC) Machine Learning & GIS (3 EC). In the mathematics domain students could choose between Partial Differential Equations (PDEs) and Inferential Statistics. The social science courses were Introduction to Ethics and Value Sensitive Design (each 1 EC). On top of that, students could choose between Systems Engineering and Trust, Risk, and Privacy Perception (each 3 EC) as an extra elective. Next to that, each student had 6 ECs of free electives. In total however, the students had to make sure that both the technical and the social side were covered by at least 3 EC worth of electives. For instance, choosing Systems Engineering (technical) would mean that at least 3 EC of your free electives would have to be social. One of the free electives offered in response to students requesting it was Introduction to Electromagnetism (IEM). Next to taking courses, students were busy planning their semesters abroad.

EduCo semester survey

Students were asked to rank the statements on a scale from 1 to 5 with 1 always being the most negative attribution (never, very poor) and 5 the most positive attribution (always, very good).

EduCo Criterion	Score	SD
1. The semester planning was clear and changes were communicated in time	3.0	0.8
2. The expectations for this semester were clear	3.5	0.5
3. An evenly spread out workload throughout the semester was possible	3.9	0.6
4. This ATLAS Semester was coherent	2.6	1.0
5. Students were able to make informed and meaningful choices about the combination of courses within the semester	2.7	1.3
6. During the semester students were introduced to various topics that can assist them in narrowing down their interests towards a possible Master's program.	2.8	1.3
7. This ATLAS Semester allowed for personalization	3.8	0.6
8. Each student had an informed mentor that helped the student in his/her academic and personal development	3.6	1.0

Discussion

In general, the EduCo observed that lots of students focused a lot on the free parts of the semester (free electives, 2nd project phase) and tended to put less emphasis on more prescribed parts such as Machine Learning & GIS and the first phase of the project. In the future, ATLAS should try to offer more courses that fit with people's interests and specializations and twist the first part of the project in a way that allows for more personalization.

Lots of electives overlapped with ATLAS courses as lectures/tutorials were scheduled at the same time. The schedule for the ATLAS courses should be made available as soon as possible so that students have the possibility to take double-scheduling into account when choosing electives.
The general outline of the semester was described clearly in the Semester 4 Syllabus. However, at the beginning of the semester many teachers had not yet compiled documents with learning goals and course content which made choosing courses and writing PDPs more speculative. This should be avoided next year. Furthermore, some students were lacking guidance and clarity in terms of finding free electives. Student missed guidance/input with finding Master programs. This is probably because there were as good as no inspiring lectures organized.

Students were confronted with lots of more traditional ways of teaching and assessment. This was mainly due to the many external electives and courses taught together with other Bachelor's studies (PDEs together with TN and Systems Engineering together with AT).

Suggested solutions to problems

Students not attending ATLAS courses
- Provide schedules as early as possible

Unpopular ATLAS courses
- The EduCo thinks that in the 4th semester, for every domain there should be more than one course offered that students can choose from. Especially in the engineering domain, students should get an alternative to Machine Learning & GIS

Problems with making choices/writing the PDP
- Make sure all learning goals are available on time

Problems with finding electives
- Professionalize process of finding/choosing electives, put process description and tips on paper

Agreements

Assigning Jan Schut as the responsible ATLAS core team member will hopefully professionalize the process of finding electives and make it clearer to students. It will be stressed that discussing your ideas and choices with your mentor is an integral part for deciding on electives. The semester coordinator could not specify many concrete plans because the content and format of the next semester 4 will depend on semester 3. Since a programming course will be offered in S3, materials science will be moved to S4. Furthermore, it's planned to offer machine learning for computer science, however, this also depends on teaching capacity. PDEs will be continued to be taught together with Applied Physics (TN). It is a learning experience for students to be confronted with sitting together in a classroom with students that are better prepared for the course due to their fitting specialization.

Project: Complex Systems

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year/semester: Semester 4, 2016, class of 2017
project coordinator: Barend Köbben

Part I: Mapping and Modeling

Summary of the project

In the first phase of the project, groups of approximately 10 people were formed, which had to map and model a spatio-temporal system. There were a couple of project updates, and the final deliverable was a seminar. The project begun with a week in which the students brainstormed for possible topics. After two groups had been formed, one focussing on clothing production in Bangladesh, and the other on meat production, the project started.
The two groups internally split up into smaller groups of 2-3 people who worked on their own aspect of the topic. Most groups used Vensim (a program introduced in the Systems Thinking course) to make a conceptual model of the small topics, and also some maps and figures were made to present the data that was found.
In the seminar the groups presented their findings. In this seminar, the small topics were reconnected and presented, with the aid of a guest speaker.
After the seminar the groups received the notes that Barend took during the seminars, but no other feedback was given.

EduCo semester survey

EduCo criteria	Score	SD
1. In the project, non-Dutch students were not put at a disadvantage	3.2	1.7
2. The ATLAS domains/courses that were taught in this semester could be integrated in this project	2.5	0.8
3. Tutors/consultants were informed about the project, and had relevant knowledge	2.1	0.8
4. Tutors/consultants were readily available/accessible for students	2.1	0.8
5. This project had a well-communicated and logical set-up	2.2	0.6
6. The students were provided with relevant information/knowledge that could be applied within the project	2.4	0.9
7. The project was based on a problem that includes both social and technical aspects	3.8	1.1
8. This project clearly stated which assumptions may be made by the students	2.6	1.0
9. The procedure for the project assessment was clear in advance	2.6	1.0

Discussion

During this first phase of the project, there were some problems which we encountered that made the project run less smoothly.

Firstly, because the interests of the members of the group differed quite some, it was difficult to find a topic which interested half of the class. As a result, the topics were so broad that the students could not work with the topic as intended in the project plan. As a result, connecting the topics of the small groups back together to make one coherent story, was very difficult.

Secondly, there was very little guidance throughout the project (this was also a problem in phase two). The groups received little to no feedback from the coordinators. This led to uncertainty amongst the students.

As the final product was only a seminar, the students felt that they had not enough time in this seminar to show all their work and findings. Also, since the seminar was not a very demanding final product, students tended to neglect the project, and focus on courses that fit better with their interests, were more demanding, or more motivating. However, the students who had invested a lot of time and effort into their project felt that this was not acknowledged, since the class received nor personal feedback, nor any clear type of assessment about the first phase. To the students, it felt as if only the second phase of the project really mattered for the assessment and assignment of EC's.

Another issue was the connection with the other courses that were taught at that time. Only ST could be directly applied. GIS would have been very applicable, but reached the necessary level too late for it to be used in the project. Also the students did not have all the skills needed to add something new with their work, and they felt as if they were doing something useless (e.g. replicating maps from the internet), and the students could not be proud of their work. This all together made the project little motivating.

Suggested solutions to problems

As the EduCo, we suggest a few ways in which the project could be improved.

By making groups smaller, students can focus more on their 'niche', which would make the project more interesting and thus motivating for the students.

More guidance, would lead to more structured working of the students, and a better idea of the students how they can still improve their work. To reach this result, it is also important that more feedback is given to the students throughout the project. This would also already directly apply when picking the subjects for the project, which in this case were picked far too broad.

Other ways in which the choosing of topics could be aided, could be by giving some exemplary topics that students can choose or use as inspiration, or by giving the students more time to pick and specify their topics better. Closing of this process of finding a topic with an official deliverable would force the groups to think through thoroughly what they actually want to do, and would give the coordinators a clear overview and opportunity to give feedback.

Agreements

When discussing the project with Barend, it was agreed that smaller groups and more guidance would be a good solution for a better functioning of the project.
Also, Barend suggested that the first and second phase of the project can be more connected, by remaining in the same groups, having content consultants for the whole project, instead of only phase two, and by having the seminar as merely an intermediate product or large project update.

Part II: Mitigation

Summary of the project

In the second phase of the project, groups of two to three students were formed that would focus on mitigating part of the problem that was used in the first phase of the project. With a coordinator from the field, they defined their deliverables, and the coordinator would also asses the project work of these groups.

EduCo semester survey

EduCo criteria	Score	SD
1. In the project, non-Dutch students were not put at a disadvantage	4.0	1.7
2. The ATLAS domains/courses that were taught in this semester could be integrated in this project	3.4	1.2
3. Tutors/consultants were informed about the project, and had relevant knowledge	3.8	1.1
4. Tutors/consultants were readily available/accessible for students	4.1	1.0
5. This project had a well-communicated and logical set-up	3.7	1.1
6. The students were provided with relevant information/knowledge that could be applied within the project	3.1	1.2
7. The project was based on a problem that includes both social and technical aspects	3.6	1.3
8. This project clearly stated which assumptions may be made by the students	2.9	1.3
9. The procedure for the project assessment was clear in advance	3.3	1.2

Discussion

Because every group took a different path, and little was coordinated by ATLAS, it is difficult to rate this part of the project as a whole. Students' liking of the project depended very much on their tutor and topic. However, still there are a few points that could be improved next year.
Firstly, the guidance when finding a consultant could have been better. Now there was little guidance for the students, while they mostly did not have much experience or contacts in their field of interest.
Secondly, the communication between ATLAS and the consultants was little and slow. Hence the consultants only knew quite late what was expected of them and what the assessment procedure would be. This was not so much a problem for the students, as for the consultants, who did not know what exactly was expected of them.
Lastly, since all the groups went their own way, it was difficult to link the projects back to the specific ATLAS courses. This was not a very big problem, but might have contributed to the demotivation of students.

Suggested solutions to problems

We suggest that in the future ATLAS tries to stay in contact with the consultants, checking how it is going with the group they are guiding and if there are any questions that the consultant has. Additionally, ATLAS could supply the consultants with information about ATLAS, and the assessment earlier, so the consultants know from the start what is expected of them.

Agreements

For the agreements made about the project, see the agreements section of part I of the project.

Courses

Machine Learning and GIS

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year/semester: Semester 4, 2016, class of 2017
teacher: Barend Köbben, Raul Zurita-Milla

Summary of the course

The course GIS & Machine Learning consisted of ten sessions usually lasting the entire afternoon that covered all steps of handling spatio-temporal data: from gathering it, and storing and extracting information, to disseminating and visualizing it. Barend covered the GIS part, and Raul was responsible for Machine Learning. As evidence, the students could choose one of

three provided assignments. Alternatively it was possible to design your own assignment or hand in results of the project work for evidence. The evidence had to be accompanied with an evaluation that covers encountered problems and an assessment of the quality of the result.

EduCo semester survey

EduCo Criterion	Score	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	3.2	1.2
2. This course featured both group and individual work	2.2	0.9
3. During this course, students were provided with a sufficient level of guidance	3.1	0.8
4. For this course, there was a variety of possibilities to prove your competence	3.1	1.0
5. This course facilitated personalization	2.7	1.1
6. This course related to the semester project and other courses	3.3	1.2
7. This course allowed for an even distribution of the workload over time	3.7	0.8
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	3.6	0.9
9. Feedback given by the teacher(s) was complete, useful and timely	3.6	1.1
10. The teacher was sufficiently available for questions/feedback about the course	3.6	1.0
11. The teacher seriously takes students' feedback about the course into consideration	2.8	1.1
12. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.2	0.9

Discussion

Learning goals, evidence and assessment was described well and clearly in the course syllabus.
GIS & Machine Learning was one of the less popular courses which was reflected in the lack of attendance and participation. The EduCo tried to find an explanation for this and found several reasons.

In the 4th semester, most students are quite specialized and have decided which academic direction they want to pursue. GIS is a quite specific field and the knowledge conveyed in the course was found to be hard to apply in a different domain. Therefore, students gave priority to

other parts of the curriculum that fit their interests better. The machine learning part was also taught with a focus on GIS applications (which makes sense looking at the background of the teacher). Students would have liked to have less GIS touch in the course. Furthermore, the sessions were very lengthy and often consisted of lots of lecturing. Some students said they found the lectures too easy, especially after having read the book in advance. On top of that, the final assignments were regarded as too easy by some students. Some students finished the final assignments prior to the beginning of the course and therefore felt that it was unnecessary to attend the classes any more.

There were no learning goals that reflected the Machine Learning part of the course. Making the final assignment did not require any Machine Learning skills or knowledge. Therefore both the final assignment and the learning goals didn't fully reflect what was covered in the course.

The feedback given about the final assignments was very in depth and useful. However, only receiving feedback in the end of the course doesn't enable students to incorporate it into in their work anymore.

Suggested solutions to problems

Attendance and participation
- Making classes more interactive, e.g. by including more mini assignments, discussions
- Make sessions shorter
- Reduce the focus on geo-information systems

Disinterest of student
- Enable students to choose their S4 engineering course by offering at least two course options. This will lead to a smaller, but more interested and committed group taking this course

Machine learning
- Include Machine learning in the learning goals
- Include machine learning in the required evidence

Agreements

A meeting was held with with Barend only. He was very open to making changes in the course. The course will be considered to be shifted back to the beginning of the semester, so that students have enough GIS knowledge for the project. Furthermore, the theory input will be made shorter and will be condensed in the beginning of the course using more ATLASy teaching techniques (e.g. flipped classroom) than lecturing. This part of the course will be finished with some form of assessment (e.g. diagnostic test). After that, students will have the possibility to choose different skill tracks that are related to the general topics of data analysis, dissemination, and visualization. Ideas for tracks could for example be web design, remote

sensing (sensors, radiation characteristics, etc.), or machine learning. This way the course will fit better with the personal interests of the students. There will be more feedback moments throughout the course (e.g. by assessing the basic theoretical knowledge after the introductory phase).

Partial Differential Equations

created by: Sarah Schöttler
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year/semester: Semester 4, 2016, class of 2017
teacher: Ruud van Damme

Summary of the course

Partial Differential Equations (PDEs) was a mathematics elective for students on an engineering track. The majority of the class followed the elective, which was taught to ATLAS as well as Applied Physics students at the same time. Video lectures and a set of notes were provided to prepare for each of the weekly sessions, which were a combination of lectures and tutorials in small groups. As a final assessment, there was an exam and later, a retake.
The goal of the course was to learn multiple methods of solving different PDEs.

EduCo semester survey

EduCo Criterion	Score	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	2.8	0.9
2. This course featured both group and individual work	2.3	1.2
3. During this course, students were provided with a sufficient level of guidance	3.4	0.8
4. For this course, there was a variety of possibilities to prove your competence	3	1.3
5. This course facilitated personalization	2.1	0.9
6. This course related to the semester project and other courses	1.6	0.5
7. This course allowed for an even distribution of the workload over time	4	0.5
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	4.2	0.4
9. Feedback given by the teacher(s) was complete, useful and timely	2.9	0.6

10. The teacher was sufficiently available for questions/feedback about the course	4.4	0.8
11. The teacher seriously takes students' feedback about the course into consideration	3.8	0.9
12. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.8	0.8

Discussion

Being a joint course with the TN students, the group was relatively large. Only 30% of respondents said they liked this, the remaining 70% either did not care or would prefer to turn this into an ATLAS-only course. Students did however the structure that was imposed on the course due to it being a regular TOM course. The general impression, which was also shared by Ruud, was that TN students understood the material much faster and asked different questions compared to ATLAS students. Possible reasons are that not all ATLAS students have a technical focus and that the TN students worked with PDEs in various physics courses before they took the maths course.

It soon became clear that ATLAS students were starting to fall behind, in reaction to which Ruud began offering additional sessions for us. Eventually, everyone passed the course, either in the first exam, in the resit or using a different type of evidence.

Suggested solutions to problems

Different skill level of TN and ATLAS students:
-    Teach the two studies separately.
The video lectures and lectures in class were not useful for everyone, some students did not attend.
-    Keep the same clear structure, but offer a variety of instruction modes and study materials. That way, different ways of learning is being catered for.

Agreements

In a meeting with Ruud, it was agreed that the course will be taught as an ATLAS-only course next year. Additionally, more weekly sessions will be offered. The clear structure will be kept, so that students could theoretically study the material at home and pass the exam without ever attending class. Lectures in small groups (split according to skill level) and guided self-study will be offered.

Inferential Statistics

created by: Sarah Schöttler
e-mail: s.schottler@student.utwente.nl
year/semester: Semester 4, 2016, class of 2017

teacher: Bernard Veldkamp

Summary of the course

Inferential Statistics was intended to be the mathematics elective for students on a social science track. Unfortunately, that was only one person - Levi.
Due to him being the only one studying this subject, there was no course setup and he worked through the material in self-study.

EduCo semester survey

Since only one person participated, this course was not part of the EduCo semester survey.

Discussion

Levi himself says that he started way too late, adding to his already high workload at the end of the semester. As Levi says, with "no one to compete with or compare [his] progress to", it is difficult to motivate yourself and stay on track, eventually leading to a lesser learning experience than with a more structured approach. This is not unique to this course, but rather a common pattern in self-study endeavours of students. This should be seen as neither the teacher's nor the student's fault, but rather as a structural issue.

Suggested solutions to problems

Self-study by students, such as this course, is often unstructured and leads to subpar performance by students.
- Further improve the standards for planning self-study courses. The EduCo has for example set up a format for students who would like to take online courses, a similar setup should be required for any kind of self-study. Especially in a case like this, it should not be entirely the student's responsibility, but the teacher/supervisor and student should work it out together.

Agreements

There are no agreements for this course specifically.

Introduction to Ethics

created by: Mark van den Heuvel
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year/semester: Semester 4, 2016, class of 2017
teacher: Brandt van der Gaast

Summary of the course

EduCo semester survey

EduCo Criterion	Score	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	3.8	0.8
2. This course featured both group and individual work	2.2	0.8
3. During this course, students were provided with a sufficient level of guidance	3.9	0.9
4. For this course, there was a variety of possibilities to prove your competence	2.7	0.8
5. This course facilitated personalization	2.8	0.7
6. This course related to the semester project and other courses	3.1	1.1
7. This course allowed for an even distribution of the workload over time	4.2	0.7
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	4.2	0.8
9. Feedback given by the teacher(s) was complete, useful and timely	4	1
10. The teacher was sufficiently available for questions/feedback about the course	4.2	0.7
11. The teacher seriously takes students' feedback about the course into consideration	4.3	0.9
12. Sufficient knowledge input and support was given to reach the learning goals set for this course	4.2	0.8

Discussion

Suggested solutions to problems

Agreements

Systems Thinking

created by: Sebastiaan Koppen
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year/semester: Semester 4, 2016, class of 2017
teacher: Alexey Voinov

Summary of the course

EduCo semester survey

EduCo Criterion	Score	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	3.2	1.2
2. This course featured both group and individual work	3.0	1.2
3. During this course, students were provided with a sufficient level of guidance	3.2	1.3
4. For this course, there was a variety of possibilities to prove your competence	2.5	1.0
5. This course facilitated personalization	3.5	0.8
6. This course related to the semester project and other courses	4.1	0.6
7. This course allowed for an even distribution of the workload over time	3.8	1.0
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	2.1	1.0
9. Feedback given by the teacher(s) was complete, useful and timely	3	1.0
10. The teacher was sufficiently available for questions/feedback about the course	3.2	1.0
11. The teacher seriously takes students' feedback about the course into consideration	3.2	0.6
12. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.1	1.0

Discussion

In general, students seem quite happy with this course and the way it was taught. One Major issue, however, was the learning goals of this course. There were never very clear learning goals for this course, which lead to students handing in only the work they had done in the class and not trying to dive deeper into the topic of modelling. Since the course was given to the project groups, most groups ended up having one person working with the program (VenSim). Still Students thought the course was very applicable to the semester (project) and was therefore useful. In their semester project, some (or all?) of the groups included the model they made during the course.

Suggested solutions to problems

Better and clearer learning goals for this course should be set. This will make it more approachable for students. Furthermore the course was very useful.

Agreements

Systems Engineering

created by: Sebastiaan Koppen
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year/semester: Semester 4, 2016, class of 2017
teacher: Maarten Bonnema, Jos Benschop

Summary of the course

EduCo semester survey

EduCo Criterion	Score	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	3.5	0.8
2. This course featured both group and individual work	2.5	1.4
3. During this course, students were provided with a sufficient level of guidance	3.1	0.6
4. For this course, there was a variety of possibilities to prove your competence	2.3	0.9
5. This course facilitated personalization	2.9	0.8
6. This course related to the semester project and other courses	3.1	1.0
7. This course allowed for an even distribution of the workload over time	3.5	0.5
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	2.8	0.9
9. Feedback given by the teacher(s) was complete, useful and timely	3.4	1.2
10. The teacher was sufficiently available for questions/feedback about the course	3.7	1.0

11. The teacher seriously takes students' feedback about the course into consideration	3.2	1.0
12. Sufficient knowledge input and support was given to reach the learning goals set for this course	3.2	0.9

Discussion

Since the course was not taught specifically for ATLAS, it can not be expected that it is taught in an "ATLAS-way". This explains why there was little to no room for group work in this course. In fact there was only one piece of evidence that could be handed in.

Suggested solutions to problems

Agreements

Trust, Risk, and Crisis Perception

created by: Valerie Lapp
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year/semester: Semester 4, 2016, class of 2017
teacher: Ardion Beldad

Summary of the course

The course "Trust, Risk, and Crisis Perception" consisted of four sessions that covered different topics related to trust, risk, and crisis perception as well as risk and crisis communication with special focus on trust renewal and repair. Each session had to be prepared for by reading three scientific papers. The final assignment was to write a risk communication strategy backed up by literature. It was a 3 EC course.

EduCo semester survey

EduCo Criterion	Score	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	4.0	0.9
2. This course featured both group and individual work	2.5	1.0
3. During this course, students were provided with a sufficient level of guidance	4.2	1.0
4. For this course, there was a variety of possibilities to prove your competence	3.0	1.7

5. This course facilitated personalization	4.2	1.2
6. This course related to the semester project and other courses	3.5	1.2
7. This course allowed for an even distribution of the workload over time	4.5	0.8
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	4.3	0.8
9. Feedback given by the teacher(s) was complete, useful and timely	3.5	0.9
10. The teacher was sufficiently available for questions/feedback about the course	3.8	1.2
11. The teacher seriously takes students' feedback about the course into consideration	4.0	1.0
12. Sufficient knowledge input and support was given to reach the learning goals set for this course	4.3	0.8

Discussion

A relatively small group of around ten students participated in the course. All students were very positive about the course, mainly stressing how interesting and interactive the lectures were. The fact that quite some international students were taking the course made it even more valuable. Furthermore, students appreciated that they could pick the topic of their final papers freely making it possible to relate it to their projects or interests.

Information about course set-up, learning goals and evidence was clearly presented in the course syllabus. The teacher was available for questions about the final assignment. The feedback on the final assignments was elaborate and helpful.

Suggested solutions to problems

Even though the course only started in the second half of the semester, student would have appreciated to have a rough course syllabus available at the time of writing their SERs.

Agreements

The results of the evaluation were presented to the teacher via email. Ardion said he is glad about the positive feedback and will take into account the issues that were raised. He furthermore said group work and more feedback possibilities will be challenging to implement due to shortness of the course. Based on the student experiences, the EduCo thinks that even without these two things, the course works fine.

Introduction to Electromagnetism

created by: Valerie Lapp
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year/semester: Semester 4, 2016, class of 2017
teacher: Yorick Birkhölzer

Summary of the course

The course "Introduction to Electromagnetism" (IEM) was set up by Yorick and Ruud in response to a group of students expressing interest in taking such a course. The course was open to both first and second year students. There was the option to choose between a heavy (3 EC) and a light (1 EC) version. The course was set up based on the book Physics for Scientists and Engineers by Tipler and Mosca. Students presented the different chapters to each other, and made a summary of their presentation for the course booklet. In addition, each student had to give a "How stuff works" presentation about one electromagnetism-related topic of choice. Recommended literature, study material, and (challenge) exercises were made available to the students. The course ended with an oral exam.

EduCo semester survey

EduCo Criterion	Score	SD
1. This course sufficiently conveyed both theoretical and applied knowledge	4.2	0.5
2. This course featured both group and individual work	3.3	1.3
3. During this course, students were provided with a sufficient level of guidance	2.0	0.0
4. For this course, there was a variety of possibilities to prove your competence	4.8	0.5
5. This course facilitated personalization	4.5	0.6
6. This course related to the semester project and other courses	3.0	1.4
7. This course allowed for an even distribution of the workload over time	3.0	1.2
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	2.3	0.5
9. Feedback given by the teacher(s) was complete, useful and timely	3.0	1.8
10. The teacher was sufficiently available for questions/feedback about the course	3.8	1.0

11. The teacher seriously takes students' feedback about the course into consideration	4.3	1.0
12. Sufficient knowledge input and support was given to reach the learning goals set for this course	4.0	1.4

Discussion

The general set-up, learning goals and deliverables were clearly described in the course book. The student presentations had higher quality than during the SST course the semester before, because their importance was stressed more. However, discussions almost never developed. This was partly because it was too time consuming to prepare for all presentations since the readings were quite lengthy..

Some of the aspects mentioned in the book and the course introduction did not take place as intended. There were no tutorials scheduled where students could ask questions about the practice exercises. The regular pre-class quizzes ceased to be sent out at some point during the course. The course information was not stored centrally during the bigger part of the course, leading to quite some confusion. Some of the students felt that the teacher's took a role that was too passive because all the lecturing was done by the students themselves.

The teachers were available and open to feedback. Through good collaboration between students and teachers, a reduced list of recommended exercises was compiled and all course information was stored in a google drive folder. Yorick was not always available because because he went on holiday for part of the course. Because of that, some students didn't received feedback on their presentations and or summaries or only with a delay.

Students had mixed feelings about the oral exams. In general, this form of assessment was appreciated because it is good to get acquainted with different forms of assessment and oral exams tend to promote a way of learning that is directed at in depth understanding. Some students expressed their concerns that oral exams are a very subjective way of assessment.

Suggested solutions to problems

Lengthy, time consuming readings
- Choose different book, that presents information more condensed, especially high school level contents

Perceived subjectivity of oral assessment
- More transparency, e.g. on the assessment criteria

No tutorials
- Offer regular tutorials

Information availability
- Store information (course book, presentation schedule) at a central location (blackboard, google drive or a blog). Also: storage of feedback (on portfolio).

Lack of discussion
- Encourage students to give interactive presentations
- Schedule time for discussion (presentations shouldn't fill the entire time)

Agreements

The course IEM won't be given next year, due to organizational reasons. But it will probably be given in 2018. A different book will be used (Principles & Practices of Physics by Eric Mazur). Less practice exercises will be given, since the high number of exercises was discouraging this year. It will be stressed that student presentations have to be kept short. This will lead to more time for discussions. Furthermore, student will be encouraged to try challenge problems.
An oral exam will be accompanied by a checklist, so that the assessment will become more transparent and there will be more detailed feedback available to the students. The "How stuff works" presentations will be kept in the same format.

Value Sensitive Design

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Summary of the course

Discussion

Suggested solutions to problems

Agreements