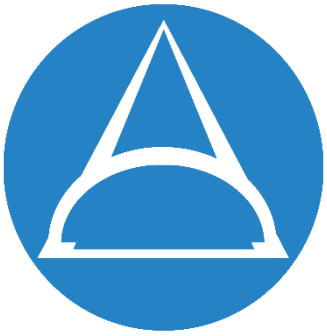

ATLAS

EduCo Semester Documentation

Semester 2, 2016, Class of 2018

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June 2016 / July 2016

Introduction

This EduCo semester documentation consists of the evaluations of the courses (including learning lines), 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 will be pointed out. Then, solutions to problems are suggested and in the last section the agreements that were made with the teacher/coordinator are described.

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Engineering: Thermodynamics

Created by: Stef Koenis
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Year/semester: Semester 2, 2016, class of 2018
Teacher: Martin van der Hoef

Summary of the course

The course 'Thermodynamics' was offered by ATLAS in the engineering domain this semester. The course consisted of four normal blocks and one deepening block

- Block 1. Temperature & Heat (Chapter 17)
- Block 2. First law of thermodynamics (Chapter 19)
- Block 3. Second law of thermodynamics (Chapter 20)
- Block 4. Fluid Mechanics (Chapter 12)
- Block 5. Deepening: Fluid Mechanics (Chapter 12 and slides Martin)

We made use of the book: Young & Freedman, University Physics 13th edition. Each block consisted of roughly 3 weeks in which we had two sessions per week, both from 13:45 until 17:30. On the first day of the first week, Martin would give an introductory lecture. When it was necessary, he would give a second lecture on the first day of the second week. The remaining time was used for self-study. Students generally had to hand in two *week problems* per block. The first week problem had to be done individually and the second one, students could do in pairs. The deadline for the first week problem was **the Friday of the second week** and the deadline of the second week problem was **the Friday of the third week**. Students had to hand in a hardcopy of their completed assignments and Martin would usually give feedback within a week. The schedule and the assessment criteria were very clear and could be found in this document. Apart from these *week problems*, Martin put *intro problems* on blackboard which you could do to practice your book knowledge and prepare for the *week problems*. There were two deepening options that were suggested: 1) follow the fifth deepening block and 2) making one or two challenge assignments for every normal block.

EduCo semester survey

(n=21), scale: 1-5

EduCo criterion	**mean**	**SD**
1. When possible, this course conveys both theoretical and applicable knowledge	4.6	0.5
2. This course features both group and individual work	5.0	0.2
3. During the course, students are provided with a sufficient level of guidance	4.5	0.8
4. For this course, there is a variety of possibilities to prove your competence	3.2	1.0
5. This course facilitates personalisation	3.3	1.0
6. This course relates to the semester project and the other courses	2.7	0.7
7. This course allows for an even distribution of the workload over time	4.5	0.6

8. The communication about learning goals, schedule, deadlines and possibilities for evidence is clear.	4.8	0.4
9. Feedback given by the teacher(s) is complete, useful and timely	4.4	0.8
10. The teacher is sufficiently available for questions/feedback about the course	4.7	0.5
11. The teacher seriously takes students' feedback about the course into consideration	4.3	0.6
12. Sufficient knowledge input and support is given to reach the learning goals set for this course	4.5	0.5

Discussion

In general, students really liked the Thermodynamics course. The schedule was crystal clear, as was most of the other course information. This allowed for an even distribution of the workload over time. There were only minor ambiguities about the course, of which the most important ones were: what happens if you failed a (the first) week problem? And: what exactly do you have to do for the deepening (fifth block)? Martin responded that he had kept this vague intentionally because he thought students should take the initiative with respect to this themselves. Something else that was really good about this course was the fast and elaborate feedback on the week problems that Martin provided: he gave constructive feedback on different levels (ranging from the maths to academic style and report writing). The feedback was not always that fast, but this was never really a problem. Students struggled most with the first block (about PDEs) but afterwards, most of them said they had actually liked this and learnt a lot from struggling with the exercises. A point of improvement that we heard from the class - especially at the start of the semester - was that Martin should try to make his lectures a bit more interactive because sometimes he went really fast and very few people could actually follow him. There were a couple of things we suggested: (Jasper's) concept tests, lectures in smaller groups (like Ruud does), involve the class a bit more in the lectures and ask the students if they were still following, and discuss more examples (intro problems) on the whiteboard. Towards the end of the course, Martin had already improved on this and his lectures had become more interactive according to students. Martin was a bit hesitant to do example problems on the whiteboard because he did not want to teach students 'tricks' but rather teach them about concepts.

Suggestions to improve the course

- Please keep giving students such elaborate and constructive feedback!
- Consider having a 'Step-up week' in which you start with easy problems and make the connection to high school stuff
- Keep focussing on improving interaction with the class
    - Try having concept test
    - Make sure that students are still following by asking them
    - Explain intro problems that more students are having trouble with on the whiteboard. A *poll* could be used to check which problems students are having trouble with
- Try to think of ways to connect the course to other domains and the semester project. This year, the course scored quite low on this (2.7)
- The course scored relatively low on personalisation (3.3) and evidence variety (3.2). Most students did not know what they could do for evidence besides the week problems. *Promoting* personalisation and other forms of creating evidence and giving them some ideas would help
- Explain more clearly what happens if you 'fail' a week problem (probably a test in the future)
- Consider calling in the help of student assistants to help during tutorials and to help marking the (diagnostic) tests. All the more because the call will be larger next year

- When helping a student it is sometimes enough to give him some hints. Some students reported that Martin often gave them the whole solution too readily. They would actually have preferred to find the solution by themselves
- Incorporate *peer-feedback* (for example on the open week problems) in the course

Agreements

- Martin will try to make the connection with the learning line Communication and the learning line Research by stressing the importance of academic writing and research methodology (in the open problems) from the beginning.
- Deadlines: Martin will make clear which (absolute) deadlines exist and until when you can receive feedback on assignments
- According to Martin, a good lecture should not be clear and understandable for all students, the main goal of a lecture is to inspire. Martin will share his views on lecturing at the start of the course to prevent confusion
- Martin will post his lecture notes on blackboard next year
- Next year, there will probably be a new course setup:
    - Test after every block to test knowledge
    - 3 large open problems, students have to write a research report about these

Mathematics: Statistics, Multivariate Analysis and Optimization

Created by: Rolf van der Hulst
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Year/semester: Semester 2, 2016, class of 2018
Teacher: Ruud van Damme

Summary of the course

We started with Statistics this semester. The course was set up to have some classic lectures for the whole class, with a slight focus on computer simulations too. There was a soft deadline for evidence after the course, after which students got the chance to discuss feedback with Ruud. There were also tutorials where students were just working on provided exercises and Ruud was helping them.

For statistics we could hand in one big file with evidence as a soft deadline.

For the other blocks (Multivariate Analysis and Optimization), the structure was different. We had lectures in small groups based on level, and tutorials where Ruud and 2 student assistants (Dawn Spruijtenburg and Oskar van der Wal) would be around, to help students make exercises. There were plenty of exercises available on blackboard, drills, problems and 'mini projects'. The problems and 'mini projects' could be used as evidence. There were no hard deadlines for evidence for this course.

For multivariate analysis there was a diagnostic test where students could test whether they understood the basics.

Near the end, Ruud introduced group sessions, where teams of 3 or 4 students would sit together and work on a problem for a morning or afternoon, and write up a report after that session to show what solutions they came to. These sessions involved immediate feedback and always resulted) in evidence.

The learning goals for Mathematics can be found in this document.

EduCo criteria

Statistics

(n=21), scale: 1-5

EduCo criterion	mean	SD
1. When possible, this course conveys both theoretical and applicable knowledge	3.7	0.9
2. This course features both group and individual work	3.0	1.0
3. During the course, students are provided with a sufficient level of guidance	3.4	1.0
4. For this course, there is a variety of possibilities to prove your competence	3.3	1.2
5. This course facilitates personalisation	3.2	1.1
6. This course relates to the semester project and the other courses	2.4	0.8
7. This course allows for an even distribution of the workload over time	4.4	0.4
8. The communication about learning goals, schedule, deadlines and possibilities for evidence is clear.	3.1	0.9

9. Feedback given by the teacher(s) is complete, useful and timely	3.1	1.1
10. The teacher is sufficiently available for questions/feedback about the course	4.0	0.9
11. The teacher seriously takes students' feedback about the course into consideration	4.2	0.6
12. Sufficient knowledge input and support is given to reach the learning goals set for this course	3.4	0.9

Multivariate Analysis

(n=20), scale: 1-5

EduCo criterion	**mean**	**SD**
1. When possible, this course conveys both theoretical and applicable knowledge	3.3	0.9
2. This course features both group and individual work	3.1	1.0
3. During the course, students are provided with a sufficient level of guidance	3.3	1.0
4. For this course, there is a variety of possibilities to prove your competence	4.0	1.0
5. This course facilitates personalisation	3.6	0.8
6. This course relates to the semester project and the other courses	2.6	1.1
7. This course allows for an even distribution of the workload over time	4.1	0.6
8. The communication about learning goals, schedule, deadlines and possibilities for evidence is clear.	2.8	0.9
9. Feedback given by the teacher(s) is complete, useful and timely	2.9	1.1
10. The teacher is sufficiently available for questions/feedback about the course	3.9	0.8
11. The teacher seriously takes students' feedback about the course into consideration	4.2	0.7
12. Sufficient knowledge input and support is given to reach the learning goals set for this course	3.7	0.6

Optimization

(n=18), scale: 1-5

EduCo criterion	**mean**	**SD**
1. When possible, this course conveys both theoretical and applicable knowledge	3.9	1.0
2. This course features both group and individual work	3.8	0.8
3. During the course, students are provided with a sufficient level of guidance	2.9	1.3

4. For this course, there is a variety of possibilities to prove your competence	3.6	0.9
5. This course facilitates personalisation	3.6	0.7
6. This course relates to the semester project and the other courses	2.9	0.8
7. This course allows for an even distribution of the workload over time	3.9	0.6
8. The communication about learning goals, schedule, deadlines and possibilities for evidence is clear.	2.8	1.1
9. Feedback given by the teacher(s) is complete, useful and timely	3.0	1.1
10. The teacher is sufficiently available for questions/feedback about the course	3.9	0.8
11. The teacher seriously takes students' feedback about the course into consideration	3.9	0.7
12. Sufficient knowledge input and support is given to reach the learning goals set for this course	3.2	0.7

Discussion

We started off with Statistics. Not everyone liked the structure. The structure was different compared to last year and the rest of the semester because there is not that much theory and it's more applied, which means the level difference is not that relevant. One of the issues was that many found these presentations to be a bit vague and hard to understand, and many struggled with this.

Multivariate and optimization we went back to the structure from last semester. A lot of people liked this better again compared to statistics.

Feedback was very late and often not complete. This is partly because people handed in things late. Many people in the class said they have 'ignored' math a bit, because of the deadlines for other subjects. Ruud felt like some students were afraid to come to the tutorials because they were so far behind, setting them even further behind.

A lot of people also indicated that the quality of the feedback could also be improved. It should be focused on "What did I do well, and what can I still improve on?". Some students indicated that they only got feedback saying "You did well, you understand this." This feedback is only useful as an indication of how well the assignment was done, setting the usefulness of the feedback back to less than the usefulness of a grade. It might be useful to also give suggestions for further challenges/ theory to learn.

Math mornings worked well, but Ruud needs to 'guide' a bit more (e.g. coming by more frequently), especially if the problem description is not very clear, since many groups tend to get stuck. People were generally positive about this way of collecting evidence however.

In general, the problem is that there is a lack of structure within and communication of the course organization. Not many people knew when to do what. This is partly because it was not very clear on blackboard (this got better after some EduCo feedback sessions) but also because many things were changed throughout the semester. Ruud tends to have many new ideas on how to do things educationally, but often the organization of these ideas lacks structure and communication. There were: Do not forget math tests-, newsletter tests, problem book, evidence mornings. There were a lot of communication channels and the structure often got lost within them.

The student assistants helped but did not really serve their function. Ruud used these since in the larger class many people tend to have questions, and he cannot answer all of them without a queue forming. This unfortunately still happened, because the student mentors were not really proactive and could also not always help with problems. Ruud

observed they were often working on their own work instead of helping students. The EduCo perceived that the info that was given to the assistants was at times far not sufficient to help the students, but whom is to blame is beside the point. The student assistants should be well-informed and have a clear description.

The results of the surveys reflect the feedback we gathered and received throughout the semester well. Math was unrelated to the project, and feedback also received low scores from students. Scheduling and communication also unsurprisingly received low scores. Positive remarks were on workload distribution, evidence opportunities, Ruud's openness to student feedback and the balance between theoretical and practical knowledge.

Suggested solutions to problems

- Have deadlines that are stricter in a way, at least if other courses have deadlines this might be necessary.
    - Force everyone to do one math morning per month that they can plan in themselves
- Guide the math mornings more- make the problem descriptions more 'guiding'
- Have a clear syllabus that is adhered to
    - Everything should be communicated through 1 communication channel (not emails, newsletters, blackboard and more etc.)
- The student assistants should have a clear function and be instructed well by Ruud.
- Structure new ideas, and communicate them through the same channel. Do not introduce too many new ideas after the beginning of the semester
- Give feedback in time

Agreements

- There will be a complete syllabus and schedule of the course before the course starts
- There will be a clear task-description for student assistants. Students who are suited for this will be informed.
- Ruud will coach the student assistants throughout the process to make sure they act proactively
- The course will take deadlines from other courses into account when setting up the course syllabus
- All information will be centralised in one place.
- The one math morning per month idea is highly likely to be done. The students have to plan these in themselves, and the deadline will be strict.
- Statistics next year will be more focused on actual statistics, less on simulation and will be in collaboration with the social science department (Ingrid will be the second teacher)
- Ruud will always sit in a room close to rooms where students are making their math mornings

Social Science: Innovation in Business and Society

Created by: Pedro Arias
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Year/semester: Semester 2, 2016, class of 2018
teacher: Fokko Jan Dijksterhuis, Klaasjan Visscher, Ardion Beldad

Summary of the course

This semester, the Social Science domain focused on Innovation in Business and Society. The domain was organized very well, though there were some issues with regards to deadlines and such which will be discussed in further detail later on. The course was given by three teachers: Fokko Jan, who focused on innovation in society, Klaasjan, who focused on innovation in business, and Ardion, who focused on communication of innovation. The assignments varied greatly; every block involved a case study (in groups which varied in size), and an optional close reading (individual). Each case study, students would select their groups and have to present with their groups their case analysis for each individual assignment, though this format did not really hold once the course moved toward communication of innovation. Each student had to do at minimum two close readings, and additional close readings could be submitted as a 1 EC deepening. The main issue encountered with the close readings was the untimely delivery of feedback, which, as described by student feedback, often did not adequately depict the student's level of work, but this will be discussed at more length later. The course and syllabus can be found here.

EduCo criteria

(n=22), scale: 1-5

EduCo criterion	**mean**	**SD**
1. When possible, this course conveys both theoretical and applicable knowledge	3.6	0.7
2. This course features both group and individual work	4	0.8
3. During the course, students are provided with a sufficient level of guidance	3.4	0.6
4. For this course, there is a variety of possibilities to prove your competence	3.4	0.9
5. This course facilitates personalisation	3.7	0.3
6. This course relates to the semester project and the other courses	3.4	0.9
7. This course allows for an even distribution of the workload over time	3.4	0.7
8. The communication about learning goals, schedule, deadlines and possibilities for evidence is clear.	3.1	0.2
9. Feedback given by the teacher(s) is complete, useful and timely	2.7	1.2
10. The teacher is sufficiently available for questions/feedback about the course	3.8	2.4
11. The teacher seriously takes students' feedback about the course into consideration	3.9	0.2
12. Sufficient knowledge input and support is given to reach the learning goals set for this course	3.4	0.5

Discussion

Throughout this semester, Innovation in Business and Society has been a very well structured course within ATLAS. The case studies presented sufficient material for introduction to each topic, encouraging teamwork in order to proceed with each topic further. As for the close readings, they offered a much more in-depth look to each one of the topics. Overall, they were received positively by the class as a whole. Case studies did not present any real issues, and were sometimes even perceived as fun, though some students did express that some of the case studies were not as relevant as others. That being said, close readings presented some problems. Repeatedly the EduCo encountered situations when feedback was given too late for students to implement in their next close reading, and the feedback for close readings did not initially give enough insight to each student on their progress. This ordeal made the students uneasy when presenting evidence as they felt they could not adequately show their progress over the course.

Having three teachers gave the class a diversity in opinions and granted a lot of options for students to choose what close readings to focus on. That being said, organising feedback sessions with three teachers proves to be challenging. If anything, each teacher had to be addressed individually, which became a bit of an issue when the EduCo wanted to deliver feedback that regarded the entire domain, such as teachers providing feedback in a timely manner. As for the final assignment, feedback on proposals for the assignment came late to a few students, prompting a need for clarity for the deadlines per teacher. The EduCo arranged a meeting with all the teachers to set a strict deadline for the assignment that was communicated to all students, and students were told to discuss the need for extensions case by case.

Suggested solutions to problems

- We suggested feedback for close readings to be given prior to the deadline of the following close reading, and/or suggest that students should be advised not to do two close readings consecutively.
- We suggested a clear and hard deadline for the final assignment, and for circumstances that required more time, to be dealt with on a case-by-case basis with the respective teacher.
- We also suggested for teachers to be more direct on the level of the work submitted with regards to the close readings as these are the documents students submit for evidence (honours level or not), particularly on individual assignments.

Agreements

- Students will be informed at the beginning semester on when feedback will be given, and feedback will be given priority for the students that wish to do continuous close readings.
- The feedback will describe the level of the work submitted by the student clearly.
- Close reading deadlines will be made clear and will be three days from the close reading session.
- The final paper deadline will be made clear at the start of the semester and any deviations will be discussed with the EduCo.

Learning Line Communication

Created by: Tim Roelofs
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Year/semester: Semester 2, 2016, class of 2018
Teacher: Ardion Beldad

Summary of the course

For the dominant learning line, Communication, four workshops were organised. The first three workshops were about academic writing, with the first two focussing on respect for intellectual property and upholding academic integrity (i.e. proper citation, paraphrasing et cetera) and the third workshop focusing on academic writing in general (e.g. writing style). These workshops took place in March. In May there was a final workshop on presentation. The learning goals for this learning line can be found here.

Discussion

Positive:

Responses to the learning line were very mixed. A sizeable number of students indicated that they learned new things during the academic writing workshops. Many students also thought that the presentation workshop was fun and well set up. Most students thought that there was a variety of possibilities to prove competence and that the learning line facilitated personalisation (although the class's reaction was mixed for both of these points). Students thought that the planning of the workshops allowed for an even distribution of the workload over time. The quality of the feedback was perceived as complete and useful.

Problems:

In general, students indicated that not enough knowledge input and support was given to reach the learning goals set for Communication. Students said they were not provided with a sufficient level of guidance during the learning line. Many students also did not feel like the workshops sufficiently conveyed new knowledge or gave opportunity to apply it. As an example, the workshops on academic writing were perceived as being too long and too focused on citation and thus did not offer sufficient new knowledge input. Since academic writing is important within research, with the multitude of reports of varying kinds, a comprehensive course on different aspects of academic writing (besides citations and paraphrasing) was left to be desired. Some students also indicated that the content of the writing workshops was quite basic and - for some students, especially those that were schooled in the United States - already covered in high school.

Another problem was the availability of the teacher. Students indicated that the teacher was insufficiently available for questions/feedback and that feedback was not very timely. The communication about learning goals, schedule, deadlines and evidence possibility was also thought to be very unclear. For instance, workshops often appeared and disappeared in the calendar or were not clearly announced, students did not get responses to their emails, etcetera.

A big part of the class did not feel like the learning line was present enough in this semester. Also many thought the learning line could have related more to the semester project and semester in general.

The schedule could be improved. Students indicated that the workshops on academic writing should have come earlier in the semester. The workshop on presentation was also very late in the semester. As a consequence of how late the workshops were conducted, a sizeable amount of presentations (for project, case studies, etc.) and academic writings (reports for project and domain assignments) were done before the workshops, which prevented students from using the acquired knowledge from the workshops in a good amount of relevant work.

Suggested solutions to problems

- The academic writing workshops could be changed so that more aspects of academic writing can be covered, since the workshops now were too focused on citation. We suggest that the lectures should incorporate more new information. Possibly some theory (e.g. about citation) can be given to the students before the workshop so that the workshops can be more applied.
- The teacher could be clearer about the schedule, learning goals, when to expect feedback, et cetera, and attempt to be more available.
- The schedule could be changed so that the workshops on academic writing are earlier in the semester.

Agreements

- Some workshops, focusing mainly on academic writing, may take place in the first semester, but if this is not possible, focus should be put on getting the workshops in the schedule early on the second semester.
- Persuasive communication will be handled within the social science domain, especially when the topic is on the communication of innovation, such as within the second semester.
- The content of the academic writing workshops will minimize the discussion on academic integrity and shift the focus on other aspects of academic writing, such as word choice and so on.
- The learning goals will be discussed within the contents of a workshop and examples for how students can meet these goals and present evidence for these will be given.
- Students will be informed of the availability of the teacher for consultation and discussion regarding their concerns. This covers what location the teacher is available for contact.

Learning Line Organisation, Teamwork and Leadership

Created by: Tim Roelofs
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Year/semester: Semester 2, 2016, class of 2018
teacher: Leonie Krab, Klaasjan Visscher. Workshops were also given by Frank van den Berg

Summary of the course

There were four workshops for the dominant Learning Line Organisation, Teamwork and Leadership (OTL) this semester: on team roles, negotiations, conflict management, and leadership styles. Also all students filled out two tests (the Belbin Roles test and the Cognitive Style Index test) and discussed the results with their project team and a teacher in a session. Furthermore, there was an inspiring lecture by Kees van der Graaf. The learning lines for this learning line can be found here.

Discussion

Positive:

Students indicated that the workshops were fun, especially the ones on negotiations and conflict management. They were also very positive about the lecture by Kees van der Graaf. This can also be seen in the results of the survey conducted about this inspiring lecture, where it got near perfect scores on all scales and positive comments (e.g. “great!”, “very inspiring”, “great inspiring lecture”) (see the documentation). The session on the Belbin and CSI tests was perceived to be useful.

Problems:

One of the problems that Leonie noted was that a lot of students did not provide evidence for the learning line other than a reflection in their SER. Students also indicated themselves that they did not really know what to hand in as evidence.

Another issue was that the amount of knowledge input that this learning line provided was apparently not very clear to some students. For instance, there was less knowledge input on leadership than some students expected: As the learning line is called “Organisation, Teamwork and Leadership” students expected that everyone would get guidance in how to be a leader, not just this semester’s project leaders. Also some students expected to learn more about organization theories. Related to this, a lot of students also noted that they did not get the message that some of the workshops were trying to convey. Especially the ones about negotiation and conflict management, albeit fun, did not seem to teach students a lot according to them.

Another issue involving the leaders was that the team leaders of project phase 1 did not receive much guidance and that their leader sessions were not very regular.

Finally, the last workshop was perceived as not very useful. Although it was described as being about leadership styles, it mostly was about core-quadrants. Because the concept of core quadrants was already dealt with in the Learning Line Learning Capacity this was not seen as very valuable by students.

Suggested solutions to problems

- There could be more explanation on various evidence possibilities for this learning line, and the importance of handing in evidence could be stressed more. Also during the first presentation there could be more attention to what the learning line entails.
- More knowledge input could be provided during the workshops (or outside of them, in that case possibly only for those interested).

- The workshops could be made more “serious”, or have more explanation afterwards, in order to better convey the message of the workshop.
- The leader sessions should be planned in advance and should be regular. Also there maybe could be more attention to leadership in the workshops.
- The last workshop should be changed, as there is too much overlap with the workshop of the Learning Line Learning Capacity on core quadrants in Semester 1.

Agreements

These problems were discussed in a meeting with Leonie (Klaasjan was not there as he had his sabbatical).

- Leonie pointed out that the point of LL is more to inspire people and wake them up about for example conflict management and give students some practical knowledge and input on their way of working. For this reason, the learning line is not very theoretical, but for those interested there are courses about organizational theories later in the curriculum. Since learning lines are generally more about skills than about theory, it is not clear whether this is a misunderstanding that only holds for this specific learning line or that students in general still do not fully get what learning lines are for. We discussed however that during the introductory workshop there could be more attention to what the learning line entails and its evidence possibilities.
- One agreements that was made was that the workshop involving core-quadrants will be changed next year as it was perceived as not very useful. Also there could be an inspiring lecture about project management but this was not surely agreed on.
- Apparently the leadership sessions were not regular because the team leaders were unknown in the beginning of the semester. For this reason, we agreed that for next year, there should be a deadline to assign leaders. Leonie will discuss this with the semester coordinator.
- Lastly the message of the workshops will be made more explicit/clear to students.

Introduction to Electromagnetism

Created by: Valerie Lapp
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Year/semester: Semester 4, 2016, class of 2017 and Semester 2, 2016, class of 2018
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.

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 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 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

- Choose different book, that presents information more condensed, especially high school level contents
- More transparency, e.g. on the assessment criteria
- Offer regular tutorials
- Store information (course book, presentation schedule) at a central location (blackboard, google drive or a blog). Also: storage of feedback (on portfolio).
- Encourage students to give interactive presentations
- Schedule time for discussion (presentations should not fill the entire time)

Agreements

The course IEM will not 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.

Improvisation

Created by: Jarmo Kikstra
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Year/semester: Semester 2, 2016, class of 2018
Coordinator: Gijs van Bilsen (external), Klaasjan Visscher

Summary of the course

The course Improvisation was moved from the third semester to the second semester on advice of the EduCo of 2017. This was because theatrical simulation, which the course was about, was thought to be relating more to the second semester. It consisted of four workshops, of which the last two dealt with creating and improving a theatrical simulation per project group. The first two workshops were introductory sessions, introducing the students to improvisation and later to theatrical simulations in specific.

EduCo criteria

(n=19), scale: 1-5

EduCo criterion	**mean**	**SD**
1. This course sufficiently conveyed both theoretical and applied knowledge	3.0	1
2. This course featured both group and individual work	2.9	1.2
3. During this course, students were provided with a sufficient level of guidance	3.7	1.0
4. For this course, there was a variety of possibilities to prove your competence	2.4	1.1
5. This course facilitated personalization	N/A	N/A
6. This course related to the semester project and other courses	2.8	1.0
7. This course allowed for an even distribution of the workload over time	3.4	1.2
8. The communication about learning goals, schedule, deadlines and possibilities for evidence was clear	2.0	0.9
9. Feedback given by the teacher(s) was complete, useful and timely	2.9	1.1
10. The teacher was sufficiently available for questions/feedback about the course	3.3	1.1
11. The teacher seriously took 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	2.8	1.0

Discussion

The relevance of this survey is debatable since the EduCo had created this survey to evaluate the ATLAS domains/courses, whereas Improvisation was given as a set of 4 workshops. For consistency, we decided to still go with this structure. Unfortunately, question 5 was not sent out. From experience, we can say that this course facilitated personalization on the project group level for the simulations, but not in terms of extra individual assignments.

The guidance during the course was seen as good, but the possibilities of proving one's competence were not various. Also, it was not clear whether Improvisation was mandatory or not and what other activities could possibly replace the course, which is shown by the low score on point 8. Furthermore, Improvisation was mentioned as a workshop that would be given in the semester, but it was not communicated in advance what role Improvisation would play in the semester, which led to the course coming as a surprise for some students. Also, no learning goals were present. Next to that, it should be communicated whether evidence is wanted and if so, in what form. Now, a theatrical

simulation was handed in by every group, but not all members of the groups participated in the course and in developing the simulation.

Not all students saw the use and relation of the course to the semester, which might have resulted in the very low amount of attendants (around half of the class). However, the course was found to be fun and interesting by others. These students were happy to have been introduced to a new way of exploratory research. In relation to the project, these workshops can certainly be useful, but it would be more convenient if the design of the group's own theatrical simulations would coincide with the approximate conceptual design phase of the project of phase II.

Together, the downsides may have led to students not finding Improvisation useful. Lastly, it might be good to shorten the time per simulation, since it looked like if the same message could often have been conveyed with a shorter simulation just as well.

Suggested solutions to problems

- Communicate what role Improvisation plays in the semester and what it consists of
- Set up learning goals for the course
- Decide and communicate clearly whether the course is mandatory or optional
- Shorten the time per simulation

Project (phase I)

Created by: Jarmo Kikstra
E-mail: j.s.kikstra@student.utwente.nl
Year/semester: Semester 2, 2016, class of 2018
Teacher: Ingrid Nota

Summary of the project

The project of semester 2 had the subject *Systems of Sustainable Energy*, with the main goal: *being able to recognize and identify the interrelationships of various social and technical aspects in a complex problem*. The project syllabus and the project learning goals and more information can be found here.

The first phase consisted of writing a scenario for the implementation of a renewable emerging technology in society. This was done in groups of 5 or 6 students. The main means of guidance were project updates and tutor meetings.

A workshop that introduced the STSc (Socio-Technical Scenario) to the class was provided by Boelie Elzen, who also gave feedback *on a presentation and* on the end-product.

New technologies were explored and pitched by students after which every student had to fill in their preferences, on which the groups were based. The project had only one deadline, on which the scenario and a justification report had to be delivered.

EduCo criteria

(n=17), scale: 1-5

EduCo criterion	**mean**	**SD**
1. For this project, the Dutch language is not a prerequisite for successful completion and non-Dutch students are not put at a disadvantage.	4.8	0.4
2. All ATLAS domains/courses that were taught in this semester can be integrated in this project	2.2	1.1
3. The group tutors/consultants are informed about the project, have basic knowledge of the relevant fields it addresses and are readily available/accessible for students.	3.1	1.1
4. This project has a clear and logical set-up that is communicated clearly to the students	3.1	1.0
5. The students are provided with some sort of knowledge input that is helpful for the project	3.5	0.9
6. The project is based on a problem that incorporates both social and technical aspects	3.8	1.0
7. This project clearly states which assumptions can be made by the students.	2.9	1.1
8. The assessment structure of this project is clearly defined and communicated to the students.	2.6	0.9

Discussion

Unfortunately, this evaluation still uses the EduCo criteria version 1, also used in the Semester Documentation of semester 1, instead of the newer EduCo criteria version 2, which are used throughout this documentation. Still, some conclusions can be drawn from this evaluation.

Almost all students heavily think that the *Dutchy Problem* (Dutch sometimes being a prerequisite or advantage) was totally absent in this phase of the project, in contrast to the semester 1 project. This was primarily caused by the fact that there was no real client.

The main critiques voiced by the students are that not all ATLAS domains were incorporated in this project (Social Science was experienced to be incorporated, but Mathematics and Engineering were not) and that there was a lack of communication. The communication of the project lacked since the assessment structure and outcome was often perceived as unclear. Furthermore, it was unclear what students could expect from the tutors and what tutors expected from the students, and it seemed that tutors were not well enough informed at the start of this project. This changed for the better towards the end of the project. Next to that, announcements and changes regarding the project and project updates were not sent appropriately in advance multiple times.

The survey also shows that the students agree that the problem tackled in this project was a socio-technical one. Another point noticed by the EduCo that was very much appreciated by students, but unfortunately not measured by this survey, was the even spread of the work load.

In general, as an EduCo, we had the impression that people began to value this project, the writing of a scenario, towards the end. It is generally seen as a useful project.

Problems and suggested solutions

Perceived problems:

- Unclear communication and structure concerning the assessment and verdict
- No feedback from the expert (B. Elzen) was given on the draft version, which was not communicated clear enough
- Tutor-student relationship seemed to be not well-defined (what to expect?)
- No physics and maths involved

Suggestions:

- A project update plan in advance, which can change over time, but updates should always be sent appropriately in advance
- Having a structured updating scheme, always notifying students appropriately in advance (Semester 1 documentation)
- A clear instruction for the tutors and students on what they both have to do and to know/tell
- Communicating the assessment structure more clearly, also justifying why this is chosen for

Agreements

- A project update plan in cooperation with the students and group leaders during one of the first sessions
- A clear instruction for tutors and about tutors for students
- Communication of the assessment will be done more thoroughly

Project (phase II)

Created by: Jarmo Kikstra
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Year/semester: Semester 2, 2016, class of 2018
teacher: Ingrid Nota, Fokko Jan Dijksterhuis

Summary of the project

The project of semester 2 had the subject *Systems of Sustainable Energy*, with the main goal: *being able to recognize and identify the interrelationships of various social and technical aspects in a complex problem*. The project syllabus and the project learning goals and more information can be found here.

The second phase consisted of addressing the challenges of sustainable energy at a systems level through a simulation. Groups consisted of 7 to 8 students. Groups had to define the system that a group would work on and the problem that they wanted to solve themselves.

The contact hours consisted of bi-weekly project updates and tutor meetings, which could be set by the groups of students. The assessment was conducted in the form of a presentation with questions in front of the entire class, combined with a 1-hour session with three assessors.

EduCo criteria

(n=21), scale: 1-5

EduCo criterion	**mean**	**SD**
1. In the project non-Dutch students were not put at a disadvantage	4.2	1.3
2. All ATLAS domains/courses that were taught in this semester could be integrated in this project	2.1	1.0
3. Tutors/consultants were informed about the project, and had relevant knowledge	2.7	1.0
4. Tutors/consultants were readily available/accessible for students.	3.6	1.1
5. This project had a well-communicated and logical set-up	2.3	1.0
6. The students were provided with relevant information/knowledge that could be readily applied within the project	2.5	0.9
7. The project was based on a problem that includes both social and technical aspects	3.7	1.2
8. This project clearly stated which assumptions may be made by the students	2.2	0.9
9. The procedure for project assessment was clear in advance	3.7	1.0

Discussion

Guidance of the groups

For this project phase, there were no official (external) consultants. The tutors were readily available and provided useful feedback in general.

Forming of the groups

The forming of groups was a discussion point. Even though there was an initial plan of having bigger groups in the second phase of the project, there was no more detailed final plan of reshuffling the groups after the first phase, which caused confusion among students. The EduCo was asked to provide the project coordinators with feedback on how big the groups should be, and the EduCo advised that the project should be carried out with its initial plan, as teamwork in a bigger group provides a new learning experience. Eventually, students that wanted to become a group leader had to send in a motivation letter to the coordinators, on the basis of which they were selected. After this, the group leaders had to pick team members in a closed session together with the tutors, based on the Belbin scores and the Cognitive Style Index. While no major problems arose from this method, opinions on whether this was the good way to go were divided.

Problem definition

In this project, no clear problem definition was given. Only the tool (simulation) of solving a particular problem, which should be complex and related to sustainability, was given. This was done based on the reasoning that students would be more motivated to work on a problem they had chosen themselves. However, it resulted in groups spending over a week on defining a problem in society, while this was not one of the learning goals of the project. *The question is whether the project wanted to teach students to define a problem themselves;* if not*, the problem definition should be clearer.*

Project updates

On advice of the EduCo, a project update plan was made in this project phase in cooperation with the class. Also, later in the project it was decided to add a 5-minute time limit to presentations to make the sessions less prosy. Despite this helping a bit, project updates were still perceived as being relatively useless, as there was little critical discussion and the updates felt more like an obligation than a helpful tool.

No clear communication in advance on whether or not there would be intermediary deadlines set by the programme.

This was only announced after asking for a plan on this.

Assessment project

While the communication of the assessment structure was mostly clear, some uncertainties were left about what would happen if groups failed the the project. After inquiring, it became clear that groups would have to do if they would not get a pass. Next to that, it became clear that the first phase of the project would not be taken into consideration for the assessment of the second phase. The first phase only came back in the SER and optional individual reflection.

Assumptions

It was not very clear what assumptions could be made, as can be seen in the results. This project consisted of making and justifying these assumptions for the model. However, there was no indication on whether the amount of complexity for making these assumptions was right.

Knowledge input

The knowledge input (score of 2.5) was found to be lacking. There were no workshops. After inquiring, the EduCo learnt that a workshop on *systems thinking* was planned, but could not be held.

Integration of domains

Unfortunately, this project did not fully succeed in integrating the domains in the project. Social science was found to be applicable, but both engineering and mathematics were not very relevant for the project.

Suggested solutions to problems

- A clearer problem definition or description, from which groups can deviate if they want to.
- Split the project groups up to have two project update sessions with half of the class

- Write a plan in advance in which the structure of the global progress of the teams is set out (to be better able to plan project updates when there is no input from the class)
- Communicate what has to be handed in when at the start of the project and also communicate the absence of intermediary deadlines if this is the first time for students
- Think about a good way to incorporate phase I in the final assessment

Agreements

- Clear deadline (after a week) with a go or no-go for a problem definition. Project coordinators will provide a backup problem definition in case of a no-go.
- The project groups will be split in two and there will be more emphasis on preparation for the project update.
- A plan will be written in advance, in which the structure of the global progress of the teams is set out (to be better able to plan project updates when there is no input from the class)
- It will be communicated what has to be handed in when at the start of the project and also the absence of intermediary deadlines will be communicated clearly.
- For more knowledge input, a workshop on simulation will be held.
- The use of supportive/vice/shadow group leaders will be encouraged if teamwork problems are perceived or when there are bigger groups.

Personal Pursuit

Created by: Pedro Arias
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Year/semester: Semester 2, 2016, class of 2018
teacher: Klaasjan Visscher, Anne van der Maat

Summary of the personal pursuit

Personal pursuits this semester were met with quite some enthusiasm by the majority of the class. Some students still needed to figure what they wanted to do for their personal pursuit but as time went on most people came to a decision. The EduCo mainly focused on how well the students were informed about the procedure for proposing their personal pursuit, finding a mentor, funding and so on.

Discussion

At the beginning of the semester it was made clear how to submit the personal pursuit proposal, though questions arose, mainly regarding funding and how to obtain a personal pursuit mentor. Throughout the rest of the semester several meetings resulted in some suggestions and agreements regarding these two points to the benefit of everyone.

- The problem with finding was that not all students knew that they could get funding for their personal pursuit (up to €200), and it was not clear what the procedure to get funding. ATLAS decided that funding would be decided upon a case by case basis and should be applied for in one's personal pursuit proposal.
- The issue of acquiring a mentor proved decidedly difficult and some students did not receive a mentor until the end of the semester. For some student this also prevented them from moving forward with their Personal Pursuit work.

Suggested solutions to problems

- At the end of the semester we also noticed that students wanted to demonstrate to the ATLAS community the result of their personal pursuit. Quite some wished to have presentations, for which no set guidelines or guidance was available on how to proceed. We suggested that some guidelines be formulated for the students next year.

Agreements

- How to get financial aid and the fact that financial aid is available will be announced in the first semester.
- Within two and four weeks after a personal pursuit proposal is accepted the student will be notified whether a suitable mentor has been found or an indication on when it will be possible to find a mentor for him.
- Guidance on who to talk to about for demonstrating the outcome of one's personal pursuit will be made available

Semester

Created by: Stef Koenis
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Year/semester: Semester 2, 2016, class of 2018
Coordinator: Fokko Jan Dijksterhuis

Summary of the semester

We already started preparing for the second semester with an information session at the end of the first semester. During this session, the semester coordinator explained what the setup would be of the second semester, which was really useful for students. The second semester ran from January 4th until June 17th but after the SER deadline on June 17th, most students had not finished their personal pursuits yet. Students had 3ECs for 'deepenings' and they had to write a deepening plan in which they stated which deepenings they would do and how these were connected to the semester goals. At the latest, this deepening plan had to be included in the revised PDP (March). There also was a mid-term assessment like in the first semester, which was communicated very poorly and there was no evidence deadline before it. The semester had a clear blackboard site which contained the learning goals for the semester and the individual courses/learning lines. At the start of the second semester we had a workshop about personalising the semester goals. The syllabus of the semester can be found here.

EduCo criteria

(n=22), scale from 1 to 5

EduCo criterion	**mean**	**SD**
1. This ATLAS Semester has a clear planning from the beginning onwards, with changes indicated appropriately in advance	3.2	0.9
2. This ATLAS Semester clearly communicates what the expectations are towards the students	3.4	0.8
3. This ATLAS Semester allows for an evenly spread out workload throughout the semester	4.0	1.1
4. This ATLAS Semester is coherent in all aspects	3.1	0.9
5. This ATLAS Semester enables students to make informed and meaningful choices on the combination of courses within the semester	3.3	0.9
6. This ATLAS Semester gives students input that can assist them in narrowing down their interests towards a possible Master's program.	3.1	0.8
7. This ATLAS Semester allows for personalisation	3.8	0.8
8. This ATLAS semester ensures that each student has an informed mentor that helps finding solutions to problems	3.7	1.4

Discussion

In general, people liked the structure of the second semester. The planning was quite clear, especially in the first half. People also really liked the block-structure of the semester with the breaks in between, so the EduCo strongly advises to keep this structure. Only for the deepenings and the learning lines, it was not very clear what was going to happen exactly at the start and also during the semester, changes in the schedule were not always made appropriately in advance. This was also the case for the course 'improvisation'. It was not clear what this course entailed, what its

learning goals were and when it would be given. There was a problem with the fact that all courses but mathematics made use of deadlines. Because of this, people always tended to postpone mathematics, which was not ideal of course (also not for the teachers: students only started submitting evidence at the end of the semester).

The session in which students worked on personalising the semester goals was good, but the fact remained that the semester goals remained really vague for most people. For some of the semester goals there was useful knowledge input (e.g. how to write a scenario and develop a well-reasoned vision about the future of a technology), but for others, there was not any knowledge input from ATLAS' courses or learning lines (e.g. learn how to deal with complex systems and with the limitations and uncertainties of models), this could certainly be improved. There were two important communication issues during this semester. Firstly: the mid-term evaluation was not announced in a clear way and hence, not everyone handed in evidence for it. Moreover, the result of the mid-term evaluation (on/off-track) did not reach all students, which caused a lot of confusion. Secondly, it was not clear when you should hand in your deepening plan and what should be in it.

During this semester, mentors were not always able to assist students making choices (about for example deepenings). That this really varied with the mentor can be seen from the large standard deviation. Finally, there was the issue (as in many ATLAS semesters) that the courses and learning lines did not relate much to each other and did not come back in the project so much.

Suggestions to improve the semester

- Communicate better about the deepening plan and include the deepening plan in the (revised) PDP and the deepening evaluation in the SER.
- Let either *all* or *none* of the courses use deadlines. This will prevent students neglecting one course (mathematics in this semester).
- Organise sessions with the domain teachers (maths and engineering) for project groups to stimulate them to incorporate the domains in the semester
- Provide more knowledge input on how to deal with complex systems and limitations and uncertainties in models. Now there was practically no knowledge input on this and students had to figure it out themselves. This knowledge input on how to deal with complex systems and modelling can come from the maths domain.
- Make clear what the exact goal of the learning lines is because this was not well understood.
- Think about ways to design the learning lines such that they provide useful knowledge input for the project (an excellent example is the learning line design in semester 1).
- Make sure mentors have a good idea of what is expected of them and what the things are they should *always do* (e.g. read and give feedback to PDP), regardless their personal style.
- Idea discussed with Fokko Jan: have a special social science course/workshop/deepening about communication and education about renewable technologies. The knowledge learnt in this course can certainly be applied in the semester project and will also make communication more dominant.

Agreements

- The mid-term assessment will be announced in a better way and the result will be communicated in a clear way (through the mentors).
- All teachers will be informed about how they should make changes to the schedule at the start of the semester.
- The semester goals will be formulated in a more understandable way so that they become more useful for students. Giving examples may help students as well.
- Improve the semester planning and syllabus, especially for the deepenings and the learning lines.
- Incorporate the improvisation course in the semester syllabus (planning, learning goals).