

## Course report KO7008\_VT20 Physical Organic Chemistry (15 hp)

Antal svar: 1

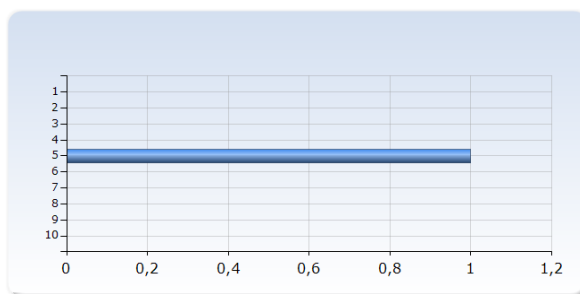
### . Responsible for Course/ Kursansvarig

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Abraham Mendoza

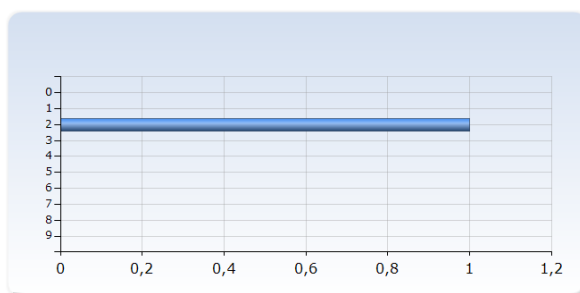
### . Number of examined students / Antal examinerade

Number of examined students / Antal examinerade	Antal svar
1	0 (0,0%)
2	0 (0,0%)
3	0 (0,0%)
4	0 (0,0%)
5	1 (100,0%)
6	0 (0,0%)
7	0 (0,0%)
8	0 (0,0%)
9	0 (0,0%)
10	0 (0,0%)
Summa	1 (100,0%)



### . Number of passed students / Antal godkända

Number of passed students / Antal godkända	Antal svar
0	0 (0,0%)
1	0 (0,0%)
2	1 (100,0%)
3	0 (0,0%)
4	0 (0,0%)
5	0 (0,0%)
6	0 (0,0%)
7	0 (0,0%)
8	0 (0,0%)
9	0 (0,0%)
Summa	1 (100,0%)



## . Description of changes since the last time the course was given.

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#### Course contents

In the chemical bond part, KS concentrated more in the understanding of the basics of MO theory with intensive practical exercises. The part of the non-covalent interactions was shortened. No changes in the content of the kinetics part (FH) was required.

Major re-design of the reactivity part (AM) to remove existing overlap with the Organometallics course. After analysis of the course book with KS and FH, it was decided to cover the most important chapters in the book that were not covered in other MSc courses, in particular pericyclic reactions (including cycloadditions and sigmatropic rearrangements) with a detailed description of electronic structure throughout the reaction coordinate (construction of MO diagrams in starting materials, products and correlation diagrams). Exercise series and exam practice activities were also implemented for formative assessment purposes and consolidate the learning. These have been appreciated by the students.

#### Mode of instruction

Conventional presentational instruction in the chemical bond part (KS), which occurred before the COVID-19 outbreak. After the outbreak in Stockholm, all lectures had to be given online via Zoom on the kinetics (FH) and pericyclic parts (AM), which worked fine according to the evaluations received from the students.

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## . The strengths of the course according to the students (based on the students answers)

### **The strengths of the course according to the students (based on the students answers)**

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The students were generally satisfied with course (4 out of 5 is most common; student's evaluation, section 4) and seemed to meet their expectations in the field of Physical Organic Chemistry with knowledge that they feel will be useful in their professional future (student's evaluation, section 7). The work load (student's evaluation, section 6) was not particularly high, as it was intended in this half-paced course throughout the semester.

The teaching by the lecturers were evaluated positively (student's evaluation, sections 1 and 8), particularly their helpful attitude to take questions during lectures, and their structured approach. It is necessary to note that the students have not felt unfairly treated or discriminated in any sense (section 14).

The summative assessment of the course through one comprehensive exam in three parts is perceived in line with the learning goals of the course. In this edition, due to the COVID-19 outbreak, it was decided to do an individual open-book home examination with more advanced exercises. Due to this unusual form of examination, the students were given one full week to return their exam. The Head of Administration in the Department of Organic Chemistry (Jenny Nilsson) was appointed to handle the anonymization of the exams.

Students seem happy with the exercise series in the course. In particular, the kinetics simulation with Copasi (FH) seem to be very popular among the students.

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## . The weaknesses of the course (based on the students evaluation)

### **The weaknesses of the course (based on the students evaluation)**

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Although the activities have been evaluated positively for their learning, some students felt there was insufficient feedback on their learning during the course.

Some students struggled mostly with the orbital symmetry (KS) and pericyclic reaction (AM) parts of the course.

In general, the students would expect more preparation activities for the exam.

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## . The teachers analysis on the course execution

### **The teachers analysis on the course execution**

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As some of the students realized, it is important to actively participate in the lectures to follow a conceptually-intensive course like this one. The lecturers (FH, AM) noticed passive participation in the online lectures during the COVID-19 outbreak but a general high attendance throughout the course, which was more problematic in previous editions. Overall, the adoption of online instruction in short noticed has been accommodated well and importantly students seem to appreciate it.

The background of the students is very heterogenous and many students lack sufficient basic knowledge in Physical Chemistry to face the particularities of Physical Organic Chemistry. It is very difficult to follow the course without proper knowledge in basic physical chemistry.

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## . Conclusions as well as suggestion on changes

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#### Mode of instruction

Exam preparation seminars need to be implemented on each part to solve previous exam exercises together with the students. We should give a dedicated time for the students to discuss the results of the exams.

It will be studied the revision of the summative assessment of the course with three separate partial exams, one after each part of the course that could help students have a more focused and deep study of each part.

Self-study and online exercise activities with implementation of Athena would be useful additions to complement the learning in all parts. Particularly to introduce individualized feedback on the progress of the student's learning which at the moment is not sufficiently structured. Initial complementary review activities in Physical Chemistry at the onset of the course would be useful for students that have not had this required training in their curriculum. A discussion on how to strengthen Physical Chemistry in the candidate program may be required.

#### Content

The "chemical bonding in organic molecules" part (KS) have already five exercises. An extra exercise will be added to get deeper practical knowledge and training in molecular symmetries. The discussion will be more focused on the properties of covalent bonding, in order to give a deeper insight and understanding on the importance molecular orbital interactions for the structure and reactivity of the organic molecules.

Revision of the second part (FH) to fully focus on kinetics would be a useful addition. Other suitable textbooks or materials will be evaluated for that purpose.

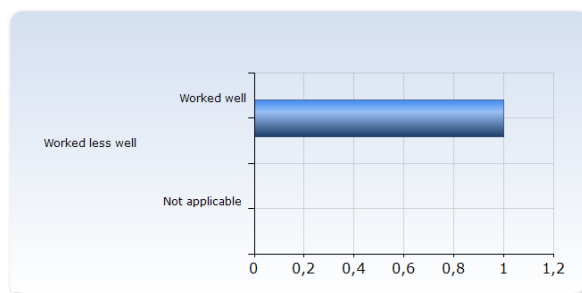
Expansion of chelotropic reactions in the pericyclic part (AM) would complete the comprehensive review of these reactions. Additional project-oriented activities in simulation of selected pericyclic processes (small calculation or microkinetic modelling) with alternative selectivities could expedite and consolidate the learning on this part of the course.

## . Booking and list of participants

### 1.The prebooked lecture rooms and halls

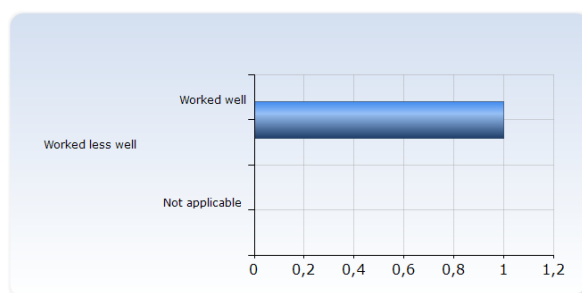
#### 1.The prebooked lecture rooms and halls

	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



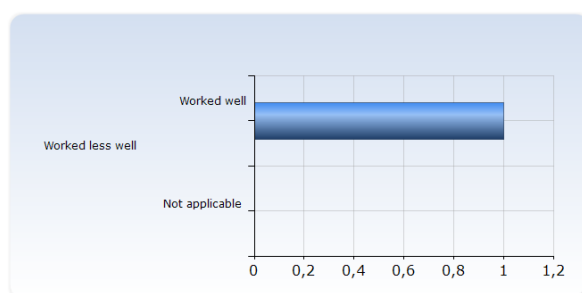
## 2. The Course Owner double checked the bookings ahead of the course commencement

2. The Course Owner double checked the bookings ahead of the course commencement	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



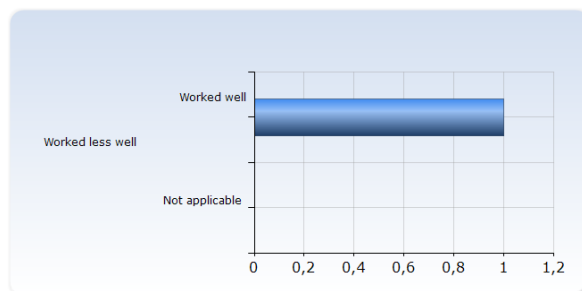
## 3. The Chemistry Sections Office shared a preliminary list of course participants ahead of course commencement

3. The Chemistry Sections Office shared a preliminary list of course participants ahead of course commencement	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



## 4. The Course Owner shared any changes to the participant list with the Chemistry Section Office.

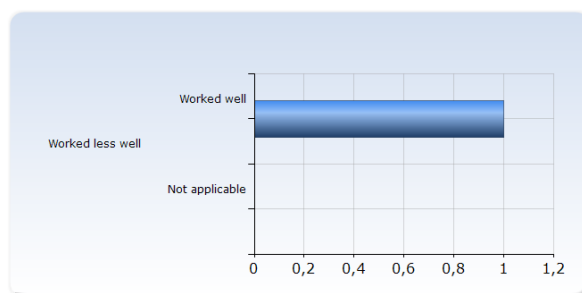
4. The Course Owner shared any changes to the participant list with the Chemistry Section Office.	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



## . Preparations

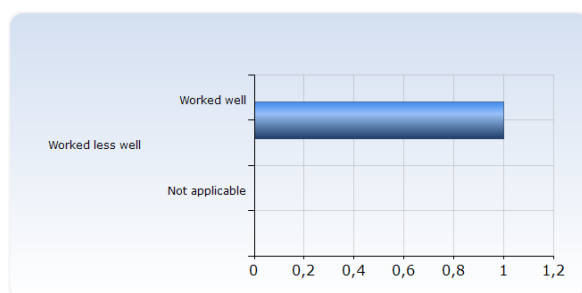
### 1. The Course Owner has ensured that the course plan was followed

1. The Course Owner has ensured that the course plan was followed	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



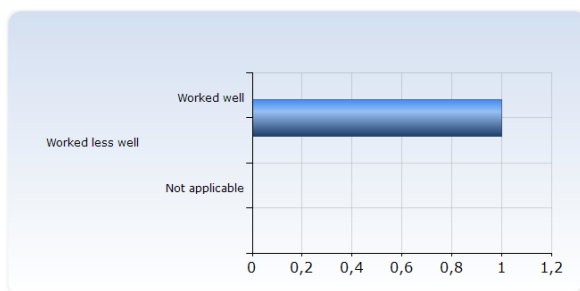
### 2. A schedule was shared with the Chemistry Sections office 4 weeks before course commencement

2. A schedule was shared with the Chemistry Sections office 4 weeks before course commencement	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



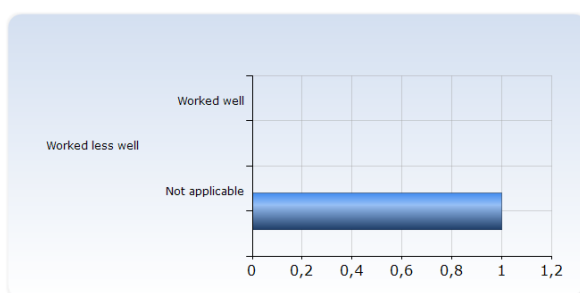
### 3. A planning meeting was held with the Teachers Assistants

3. A planning meeting was held with the Teachers Assistants	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



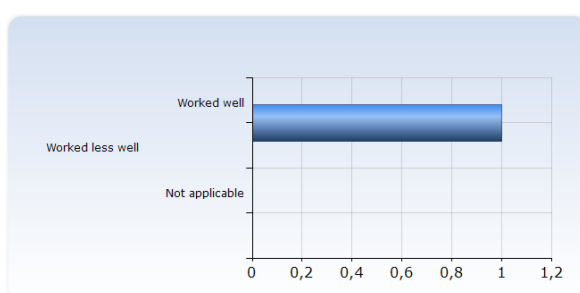
### 4. TA's and students were informed on when lab reports should be handed in and circumstances surrounding the correction of these.

4. TA's and students were informed on when lab reports should be handed in and circumstances surrounding the correction of these.	
	Antal svar
Worked well	0 (0,0%)
Worked less well	0 (0,0%)
Not applicable	1 (100,0%)
Summa	1 (100,0%)



### 5. Grading criteria were shared with the students at the beginning of the course

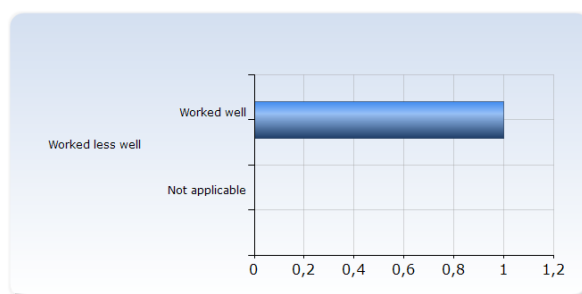
5. Grading criteria were shared with the students at the beginning of the course	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



## . During the course

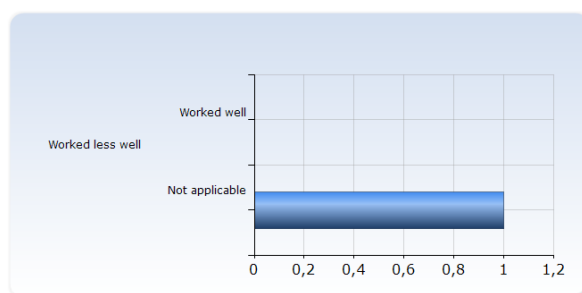
### 1. Necessary equipment was available and worked

1. Necessary equipment was available and worked	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



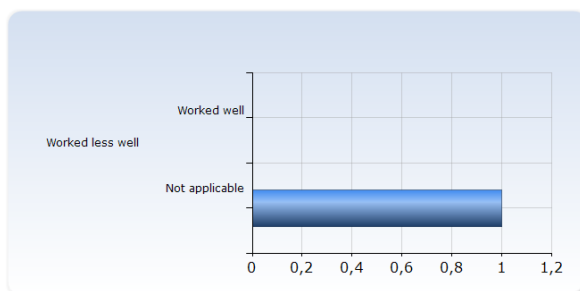
### 2. The study councillor was informed on students who were experiencing learning challenges

2. The study councillor was informed on students who were experiencing learning challenges	Antal svar
Worked well	0 (0,0%)
Worked less well	0 (0,0%)
Not applicable	1 (100,0%)
Summa	1 (100,0%)



### 3. Lab reports were corrected in a timely manner after being handed in.

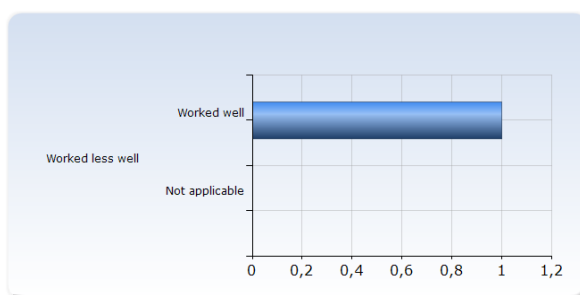
3. Lab reports were corrected in a timely manner after being handed in.	
	Antal svar
Worked well	0 (0,0%)
Worked less well	0 (0,0%)
Not applicable	1 (100,0%)
Summa	1 (100,0%)



## . Exam and grading

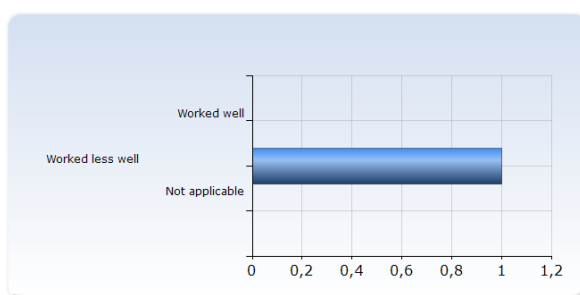
### 1. Examinations were done anonymously and according to examination rules

1. Examinations were done anonymously and according to examination rules	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



### 2. The exam (the questions) were shared with the Chemistry Section Office 2 weeks after the course had ended

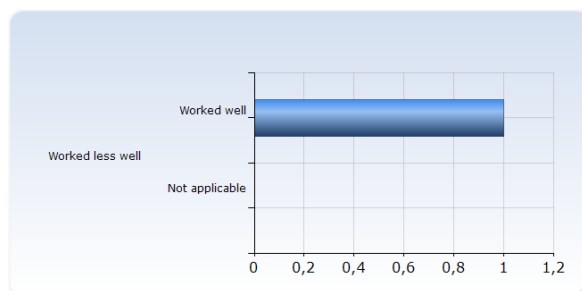
2. The exam (the questions) were shared with the Chemistry Section Office 2 weeks after the course had ended	
	Antal svar
Worked well	0 (0,0%)
Worked less well	1 (100,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)





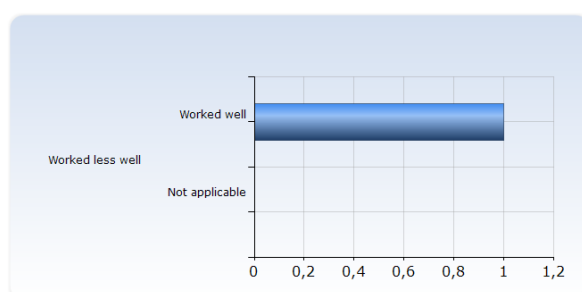
### 3. The exams were corrected less then three weeks after the examination

3. The exams were corrected less then three weeks after the examination	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



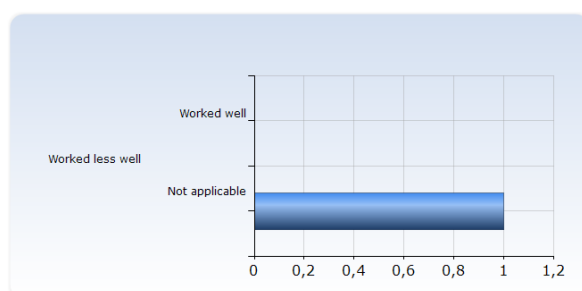
### 4. Th students were offered a exam review

4. Th students were offered a exam review	
	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)



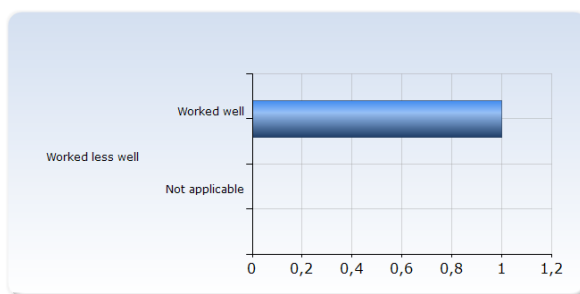
### 5. The grades for the practical part of the course was shared with the Chemistry Sections Office and the Director of Studies

5. The grades for the practical part of the course was shared with the Chemistry Sections Office and the Director of Studies	
	Antal svar
Worked well	0 (0,0%)
Worked less well	0 (0,0%)
Not applicable	1 (100,0%)
Summa	1 (100,0%)



## 6. The grades for the exam was shared with the Chemistry Section Office and the Director of Studies

6. The grades for the exam was shared with the Chemistry Section Office and the Director of Studies	Antal svar
Worked well	1 (100,0%)
Worked less well	0 (0,0%)
Not applicable	0 (0,0%)
Summa	1 (100,0%)

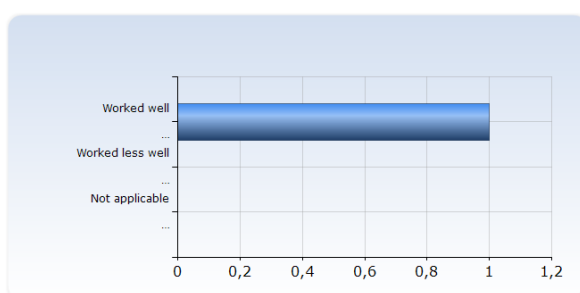


## . Follow up

### 1. Course specific questions were developed and shared with the Chemistry Sections Office

#### 1. Kursspecifika frågor för kursvärderingen formulerades och skickades till expeditionen

1. Course specific questions were developed and shared with the Chemistry Sections Office	
1. Kursspecifika frågor för kursvärderingen formulerades och skickades till expeditionen	Antal svar
Worked well	1 (100,0%)
Fungerade bra	
Worked less well	
Fungerade mindre bra	0 (0,0%)
Not applicable	
Ej relevant	0 (0,0%)
Summa	1 (100,0%)



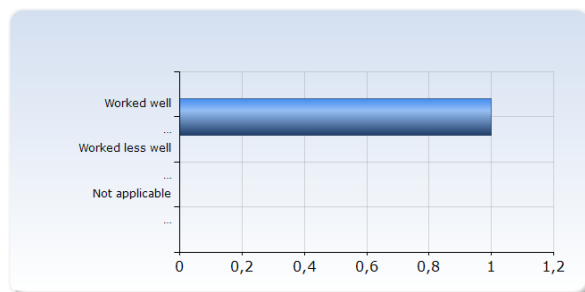
## 2. The Chemistry Section Office shared the final course evaluation with the Course Owner

### 2. Expeditionen skickade en sammanställning av kursvärderingen till kursledaren

2. The Chemistry Section Office shared the final course evaluation with the Course Owner

2. Expeditionen skickade en sammanställning av kursvärderingen till kursledaren

	Antal svar
Worked well	1
Fungerade bra	(100,0%)
Worked less well	
Fungerade mindre bra	0 (0,0%)
Not applicable	
Ej relevant	0 (0,0%)
Summa	1 (100,0%)



### . Additional comments on the admin for the course