



arteveldehogeschool

LID VAN DE ASSOCIATIE UNIVERSITEIT GENT

(Automated) Analysis and feedback of students' results and progress

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3 levels of analysing student's results



Institution



Degree
Programme



Course unit

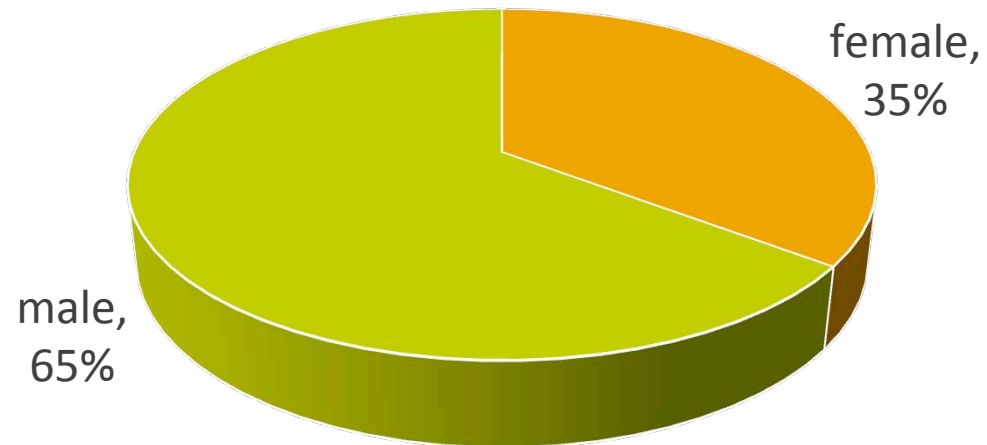
Photo- & colourimetry

- First year's course, first semester
- Course content
 - colour is a visual, subjective perception.
How can you objectify and measure that perception device independently?
 - Science/math/technology



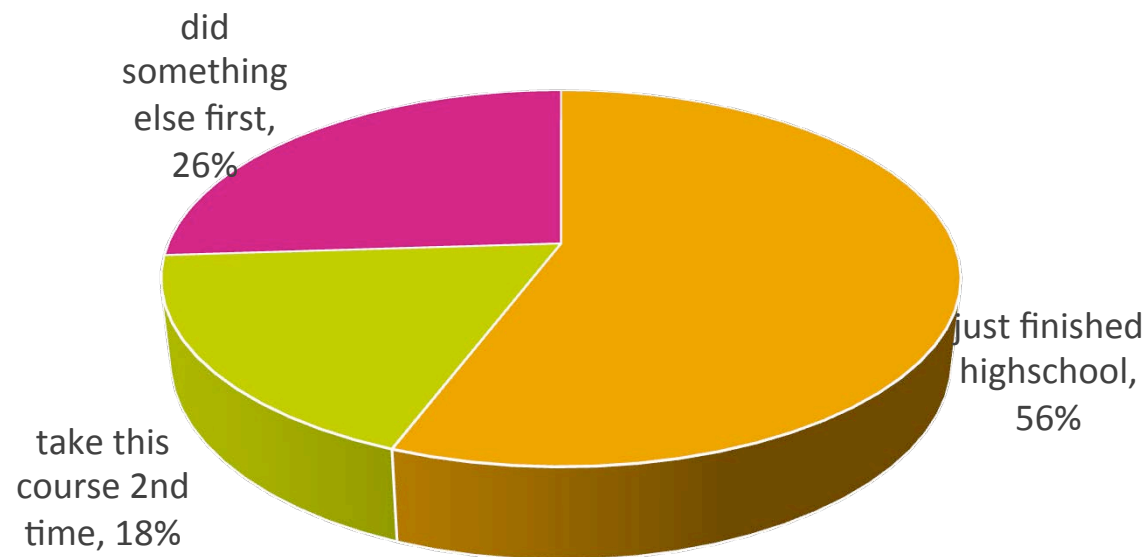
Target audience

1. is male



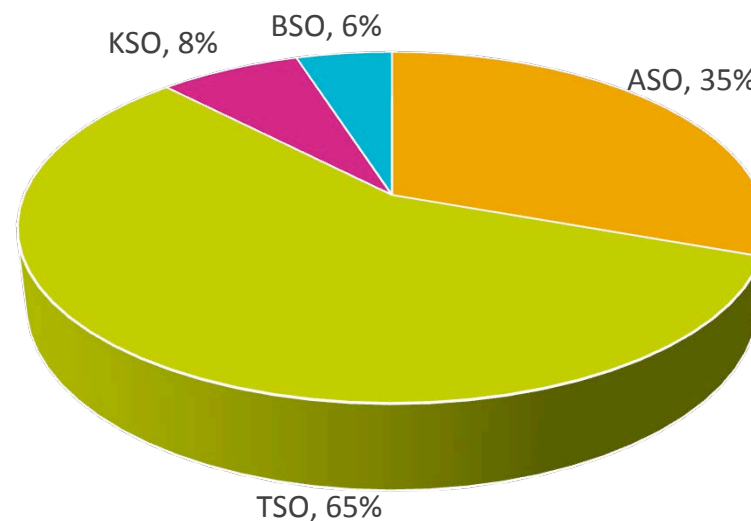
Target audience

1. is male
2. has just finished highschool



Target audience

1. is male
2. has just finished highschool
3. has a preparatory training at a technical level



Not an ideal match

Target audience

**Photo- and
colourimetry**

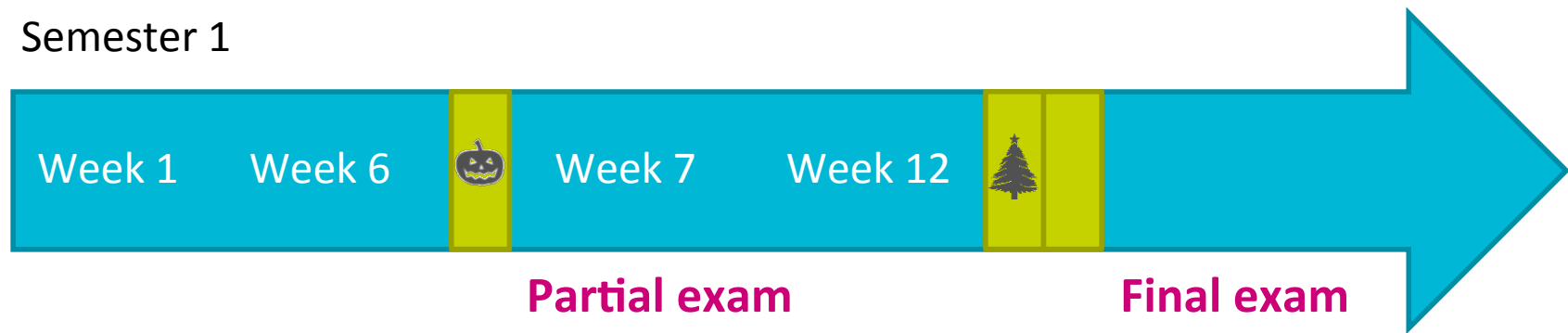


Overview

- Problem: not an ideal match
- How I assess and why
- How I use the data obtained
- Conclusion

Two exams

Semester 1



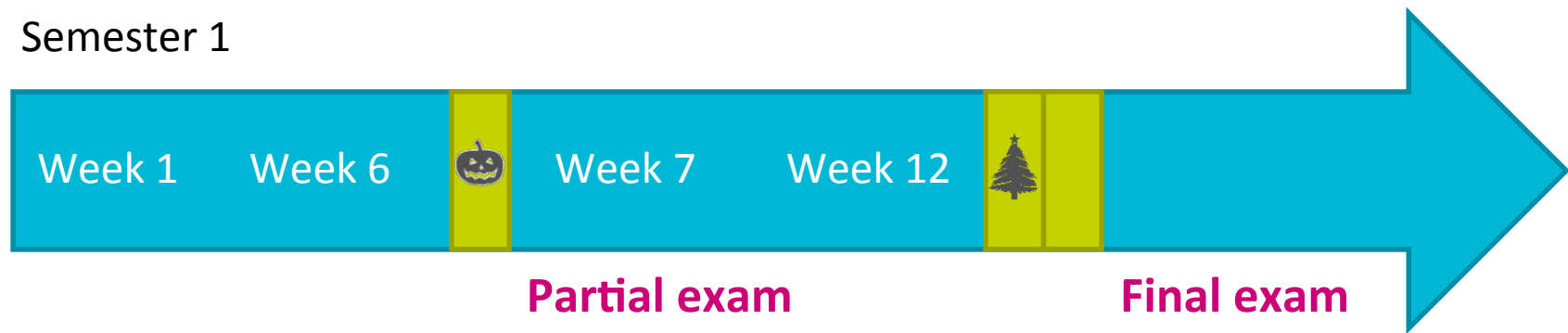
$25\% \times \text{score partial exam}$

$+ 75\% \times \text{score final exam}$

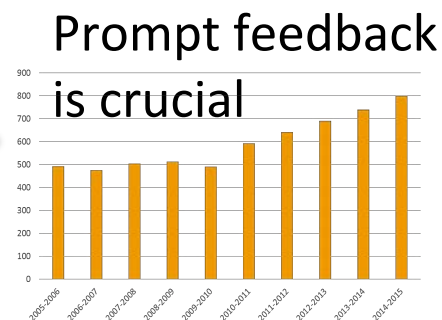
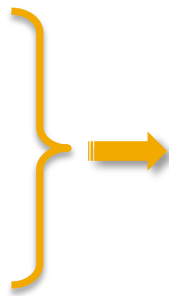
Total score

Two exams: why?

Semester 1



- motivate to start studying
- familiarize students with exams in higher education
- learn from mistakes



Two exams result in a lot of data

	1	2	...	40	Ch i	K	i	E	score
Student 1	A	B		D	80 %	50 %	40 %	30%	9/20
...	...	...		...	...	...	...	...	...
Student 400	A	C		A	20 %	100 %	80 %	40 %	15/20

Illuminance is measured in ...

- A. cd
- B. cd/m^2
- C. lm
- D. lx

Chapter i: % correct answers

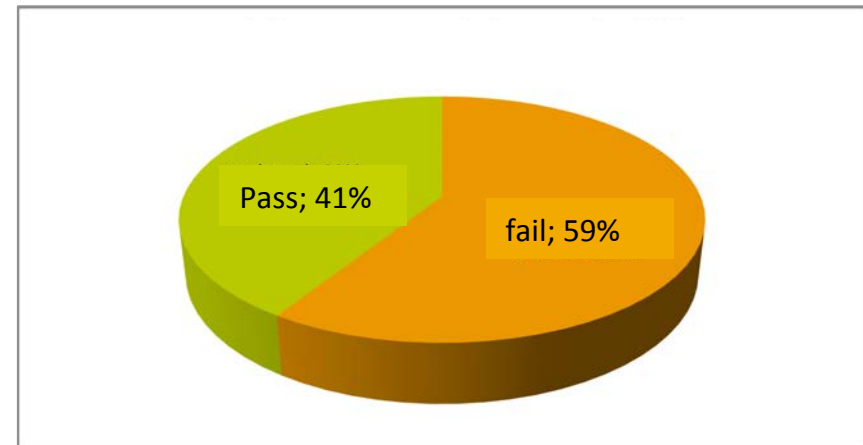
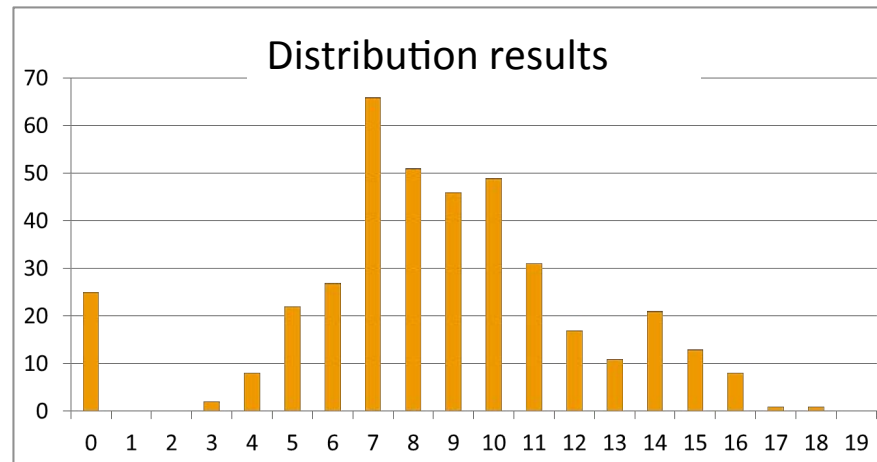
Every question has a type

- Knowledge
- Insight
- Exercise

which we use to answer questions

1. What's the overall mastery level of this group?
(degree programme/teacher)
2. How can I improve my teaching strategy and the exam questions?
(teacher)
3. How can I give students tools to reflect upon their learning strategy?
(student)

1. What's the overall mastery level of this group?



2. How can I improve the exam questions and my teaching strategy?

	1	2	...	40	Ch i	K		E	score
Student 1	A	B		D	80 %	50 %	40 %	30%	9/20
...	...	...		...	...	...	...	...	...
Student 400	A	C		A	20 %	100 %	80 %	40 %	15/20
P-value	100%	0%		75%					

P-value = % students with a correct answer

- $50 \% < \text{good P-value} < 60 \%$
- (too) low $\rightarrow$ Is question ok? Make changes in lessons or the syllabus?
- (too) high $\rightarrow$ Question too easy?

2. How can I improve the exam questions and my teaching strategy?

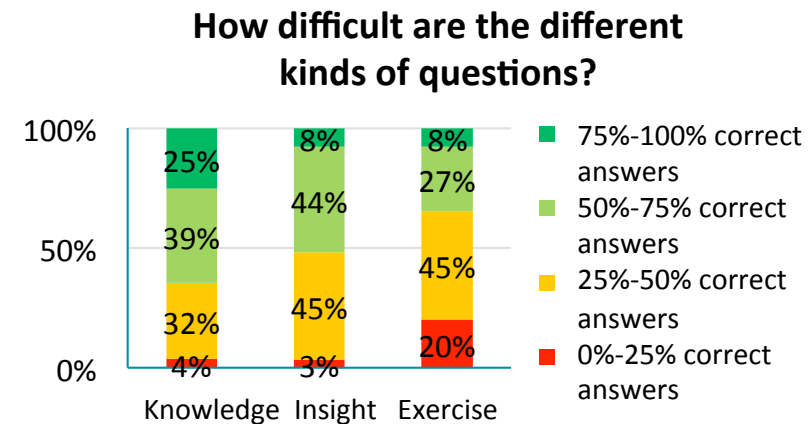
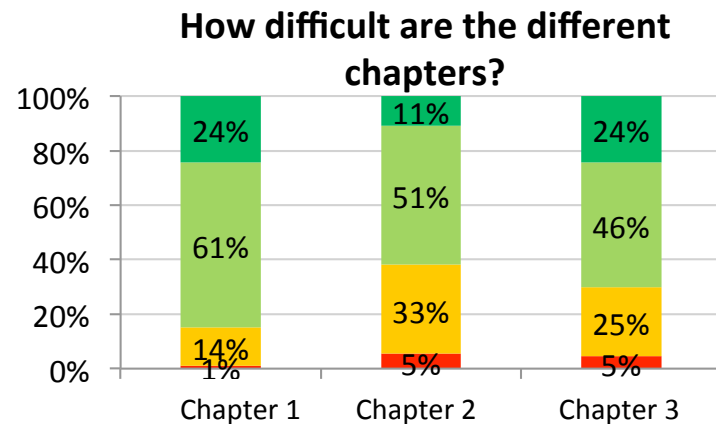
	1	2	...	40	Ch i	K	E	score	
Student 1	A	B		D	80 %	50 %	40 %	30%	9/20
...	...	...		...	...	...	...	...	...
Student 400	A	C		A	20 %	100 %	80 %	40 %	15/20
Rit-score	0,6	0,1		-0,2					

Rit-score = correlation between the overall scores on the exam and the scores on that question.

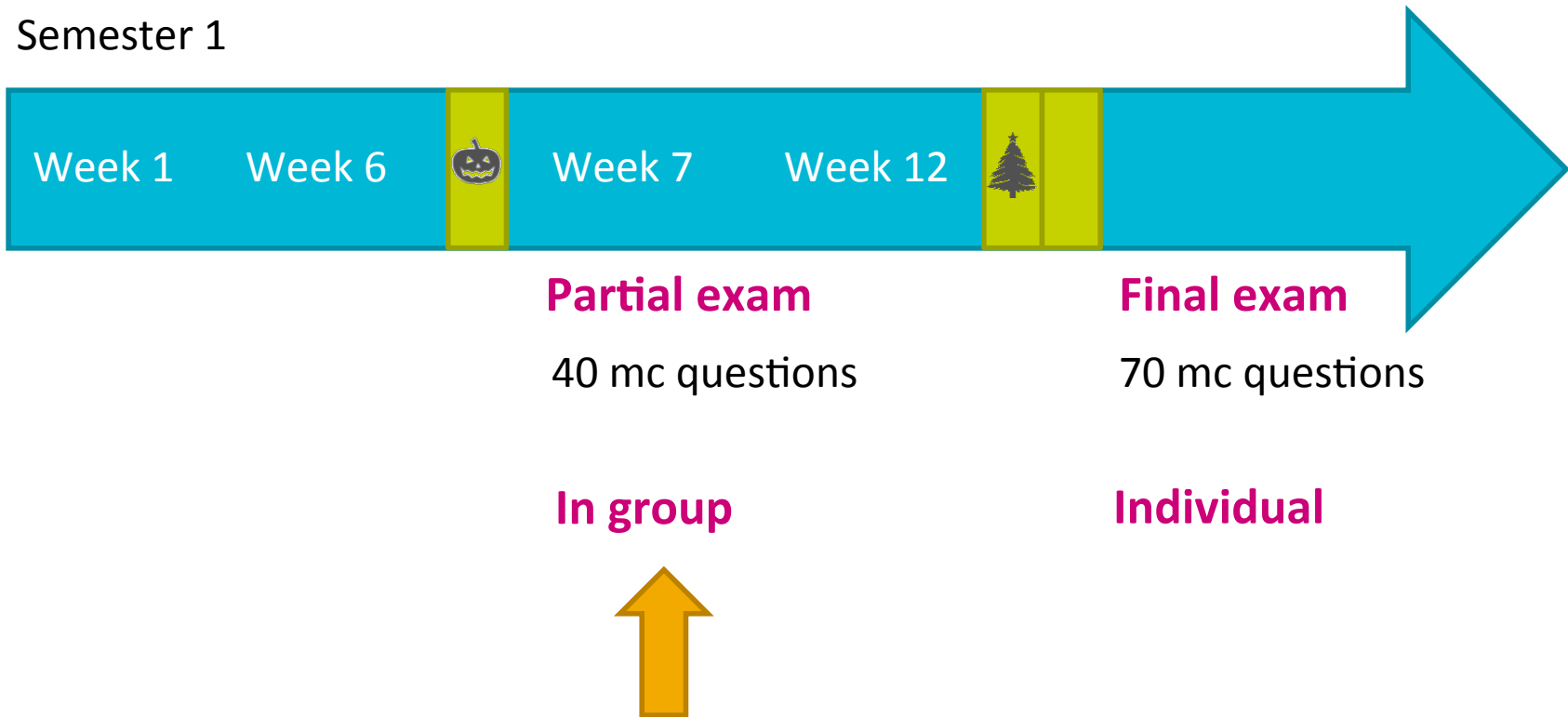
- Near 1 → high scorers answered that question *correctly* more frequently than low scorers
- Near -1 → high scorers answered that question *incorrectly* more frequently than low scorers
- Rit-score < 20 % → change or delete that question

2. How can I improve the exam questions and my teaching strategy?

	1	2	...	40	Ch i	K	E	score	
Student 1	A	B		D	80 %	50 %	40 %	30%	9/20
...	...	...		...	...	...	...	...	...
Student 400	A	C		A	20 %	100 %	80 %	40 %	15/20



3. How can I give students tools to reflect upon their learning strategy?



Group feedback: preparation

- Results are made public
 - % correct answers of different course chapters
 - % correct answers of different types of questions
 - Answers on questions I will discuss in class

	naam	Ch 1	Ch 2	Ch 3	knowledge	insight	exercise	vr 8	vr16	vr18	vr19	vr24
IAa	Adins Aline	55%	75%	44%	54%	60%	86%	✗	d	✓	✗	✓
IAa	Ahmedov Borhan	55%	35%	22%	54%	25%	43%	✗	d	✗	✗	✗
IAa	Andréka Jeffrey	55%	30%	33%	54%	30%	29%	✗	d	✗	✗	✗
ICMOa	Asseloos Cynthia	64%	60%	44%	62%	60%	43%	✗	d	✓	✗	✗
IAa	Baes Chloë	18%	25%	0%	15%	20%	14%	✗	d	✗	✗	✗
IAa	Ballyn Lucas	100%	70%	89%	92%	85%	57%	✓	d	✓	✓	✗
IAa	Bertin Dieter	55%	20%	22%	46%	25%	14%	✗	d	✓	✓	✗
IAa	Blakaj Ismet	55%	60%	78%	62%	65%	57%	✗	d	✗	✓	✗
IAa	Bockstael Raïsa	55%	20%	0%	38%	20%	14%	✗	d	✗	✗	✗
IAa	Bogaert Mathijs	64%	60%	67%	62%	60%	71%	✗	d	✗	✗	✗
IAa	Bosmans Anouck	73%	60%	33%	62%	50%	71%	✓	d	✓	✓	✗
IAa	Broekaert Simon	73%	60%	89%	77%	75%	43%	✓	d	✓	✗	✗
IAa	Bruijns Iris	36%	20%	33%	31%	20%	43%	✗	d	✗	✗	✗
IAa	Bruwier Artuur	82%	45%	56%	85%	45%	43%	✗	d	✗	✓	✗
IAa	Burgue Nico	45%	20%	44%	54%	25%	14%	✗	d	✗	✗	✗
IAa	Callebaut Laurens	73%	50%	44%	46%	55%	71%	✓	d	✗	✗	✓

Group feedback: discuss questions

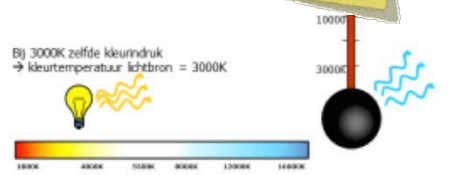
- 10 questions with lowest P-value
- Recall the lesson, explain again, give and ask tips and tricks

Vraag 19 - K

- Definitie: Kleurtemperatuur
= temperatuur die **zwart**
uitzendt met zelfde **kleur**

TIP
Zorg dat je
definities kent,
maak tekeningen

Bij 3000K zelfde kleurdruk
→ kleurtemperatuur lichtbron = 3000K



Group feedback: discuss questions

- 10 questions with lowest P-value
- Recall the lesson, explain again, give and ask tips and tricks
- Ask the question, let students respond in pairs with socrative.com

The screenshot shows a Socrative student interface in a Google Chrome browser. The address bar displays <https://b.socrative.com/student/#take-quiz/q/2>. The page header includes the Socrative logo and the text "2 VAN 9". Below the header, there is a "Vernieuwen" button. The main content area displays "vraag 14" and four multiple-choice options labeled A, B, C, and D. Each option has a text input field with a score calculation: (3665 % 3600) % 60. Option C is highlighted in blue. At the bottom, there is an orange button labeled "ANTWOOD VERZENDEN".

The screenshot shows a Socrative teacher interface in a Google Chrome browser. The address bar displays <https://b.socrative.com/teacher/#final-results/16677807/11045339/table>. The page title is "vooruitgeschoven examen webdadi". The table below shows the final results for 10 anonymous students across 7 questions.

Naam	A-Z	Score	#1	#2	#3	#4	#5	#6	#7
Anon 03ac5		0%		A	C	D	B	B	D
Anon 044f1		14%		A	D	D	A	B	A
Anon 04598		0%	Het is m	C	D	D	B	C	D
Anon 045cd		0%	Groepen						
Anon 09aa3		29%	In klein	D	D	D	A	A	A
Anon 143c4		14%		B	D	D	A	C	D
Anon 14610		14%		C	D		D		C
Anon 15a66		29%	Niets, b	C	D	B	D	A	C
Anon 1864a		0%							
Anon 19528		0%							

Group feedback: reflect

- Reflect in pairs on following questions
 - What did I learn today?
 - What can I do to perform (even) better on the final exam?
- Write down one or more SMART-goals
www.mentimeter.com



Wat zal ik onthouden uit deze feedbackles? Wat zal ik anders doen om het in januari (nog) beter te doen? - Mentimeter - Google Chrome

https://www.mentimeter.com/s/5640ef1839621e10f84a1b09c880034a/921030901258

Go to **www.govote.at** and use the code **37 47 37**

Wat zal ik onthouden uit deze feedbackles? Wat zal ik anders doen om het in januari (nog) beter te d...

Mentimeter

Meer opletten in de les.

Vroeger beginnen leren!

Minder slapen in de les

Samenvattingen op voorhand maken alle
Oef opnieuw maken, vragen stellen in de les

Zelf samenvattingen maken ipv ze van dropbox te halen

beter notities nemen van de les

Meer van voor zitten in de les

Examen vragen goed onthouden! #swek

Meer opletten in de les.

Niet beginnen samenvatten 2 dagen voor

Een formularium maken met alle eenheden

Zowel oefeningen als theorie bekijken

☑

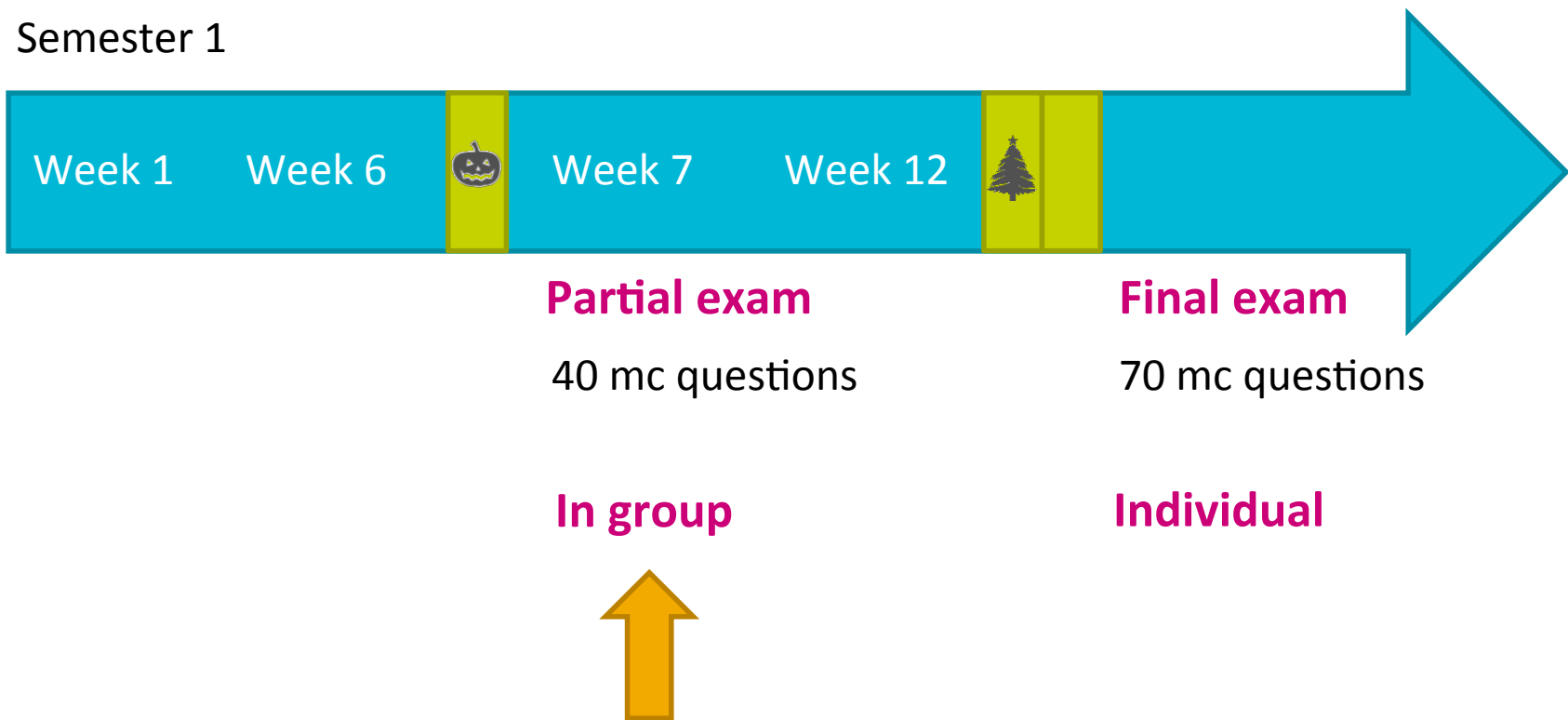
☰

Votes: 20

Class_17_06_2015_2....xl... Class_28_04_2015_2....xl... Quicksheet Analysepdf

Alle downloads weergeven...

3. How can I give students tools to reflect upon their learning strategy?

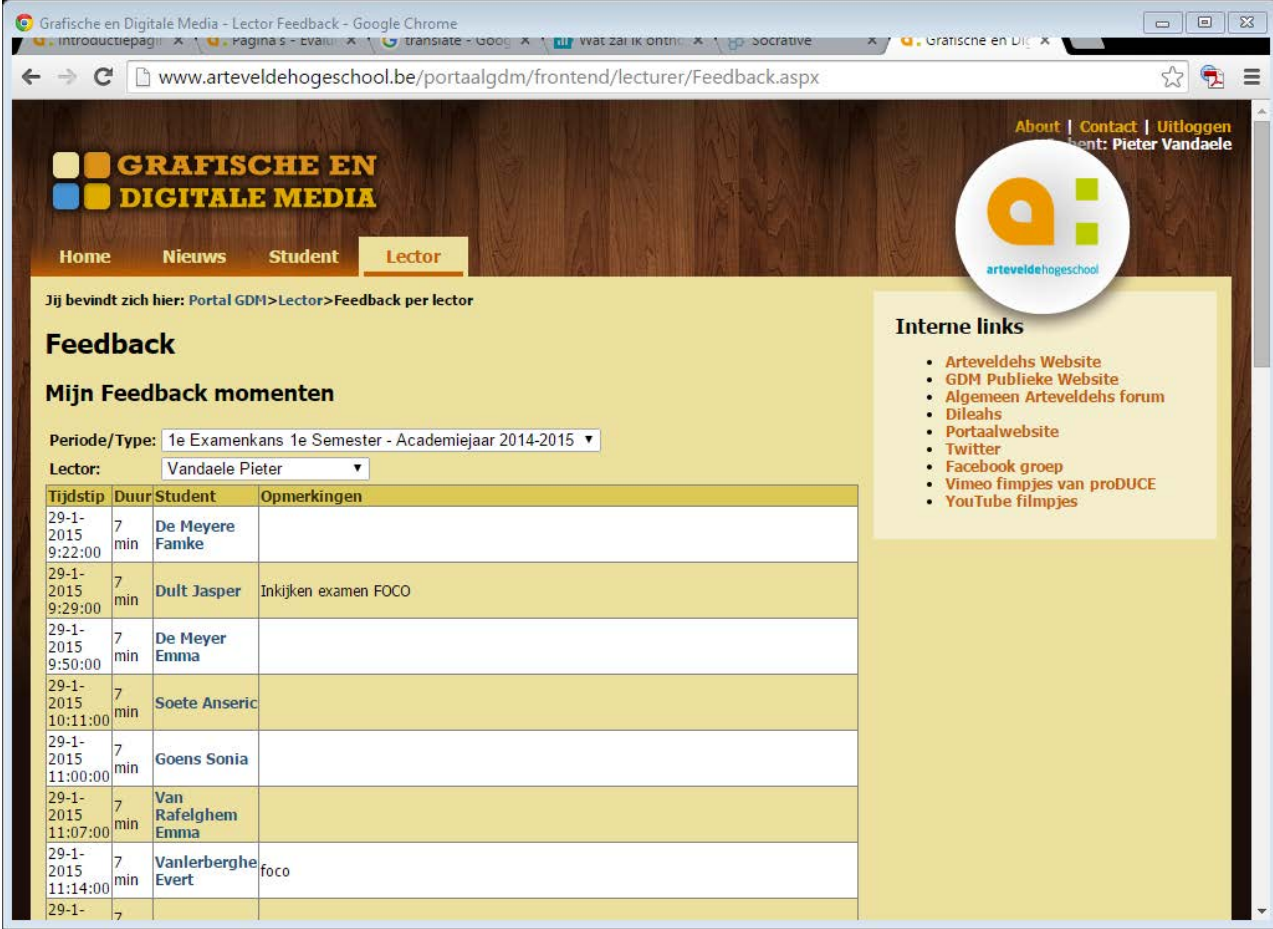


Individual feedback: preparation

- Results are made public
 - % correct answers of different course chapters
 - % correct answers of different kinds of questions

	naam	H01	H02	H03	kennis	inzicht	rekenen
IAa	Adins Aline	55%	75%	44%	54%	60%	86%
IAa	Ahmedov Borhan	55%	35%	22%	54%	25%	43%
IAa	Andréka Jeffrey	55%	30%	33%	54%	30%	29%
ICMOa	Asseloos Cynthia	64%	60%	44%	62%	60%	43%
IAa	Baes Chloë	18%	25%	0%	15%	20%	14%
IAa	Ballyn Lucas	100%	70%	89%	92%	85%	57%
IAa	Bertin Dieter	55%	20%	22%	46%	25%	14%
IAa	Blakaj Ismet	55%	60%	78%	62%	65%	57%
IAa	Bockstael Raïsa	55%	20%	0%	38%	20%	14%
IAa	Bogaert Mathijs	64%	60%	67%	62%	60%	71%
IAa	Bosmans Anouck	73%	60%	33%	62%	50%	71%
IAa	Broekaert Simon	73%	60%	89%	77%	75%	43%
IAa	Bruijns Iris	36%	20%	33%	31%	20%	43%
IAa	Bruwier Artuur	82%	45%	56%	85%	45%	43%
IAa	Burgue Nico	45%	20%	44%	54%	25%	14%
IAa	Callebaut Laurens	73%	50%	44%	46%	55%	71%

Individual feedback: appointment



The screenshot shows a web browser window with the URL www.arteveldehogeschool.be/portaalgdm/frontend/lecturer/Feedback.aspx. The page is titled "GRAFISCHE EN DIGITALE MEDIA" and features a navigation menu with "Home", "Nieuws", "Student", and "Lector". The "Lector" tab is selected. The main content area is titled "Feedback" and "Mijn Feedback momenten". It displays a table of feedback appointments for the period "1e Examenkans 1e Semester - Academiejaar 2014-2015" and the lecturer "Vandaele Pieter". The table has columns for "Tijdstip", "Duur", "Student", and "Opmerkingen".

Tijdstip	Duur	Student	Opmerkingen
29-1-2015 9:22:00	7 min	De Meyere Famke	
29-1-2015 9:29:00	7 min	Dult Jasper	Inkijken examen FOCO
29-1-2015 9:50:00	7 min	De Meyer Emma	
29-1-2015 10:11:00	7 min	Soete Anseric	
29-1-2015 11:00:00	7 min	Goens Sonia	
29-1-2015 11:07:00	7 min	Van Rafelghem Emma	
29-1-2015 11:14:00	7 min	Vanlerberghe Evert	foco
29-1-2015	7		

On the right side of the page, there is a section titled "Interne links" with a list of links:

- Arteveldehs Website
- GDM Publieke Website
- Algemeen Arteveldehs forum
- Dileahs
- Portaalwebsite
- Twitter
- Facebook groep
- Vimeo filmpjes van proDUCE
- YouTube filmpjes

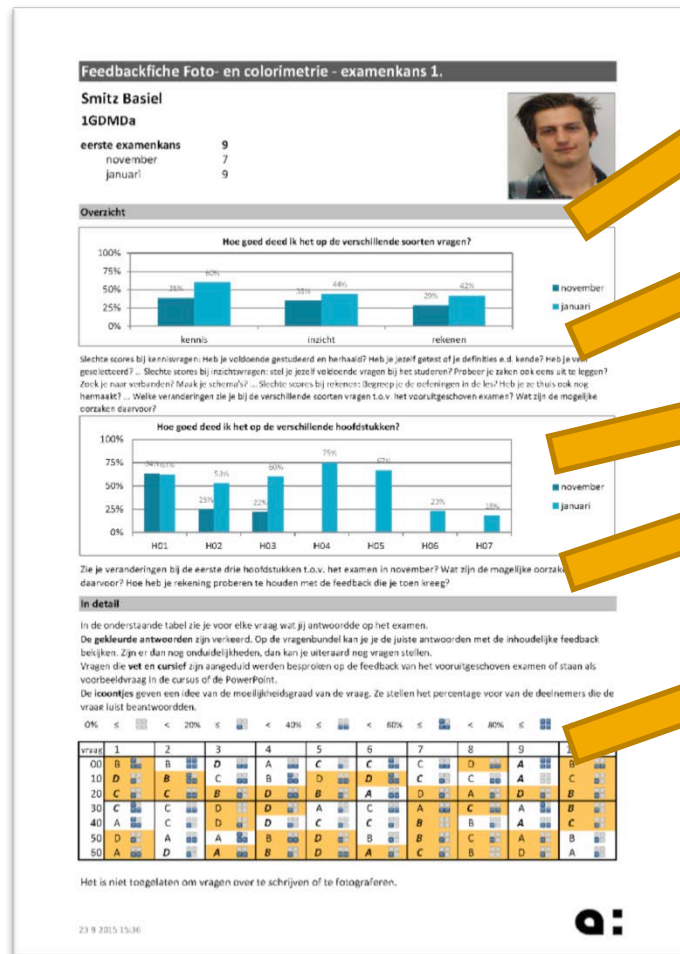
7 minutes /
student

9:22 am till 16:50
pm

Impossible to
discuss 70
questions



Individual feedback: reflection



% correct answers of different chapters of partial and final exam

Questions to help students to reflect

% correct answers of different kinds of questions of partial and final exam

Questions to help students to reflect

Students answers on each question

I talk with the student about his study-strategy, coach him to look for causes for his failure and aim at motivating him

Individual feedback: the questions

KI
H02

12. Welk spectrum hoort bij welke lichtsoort?

- a. lichtsoort A – 1; D50 – 3; D65 – 2; lichtsoort E – 4
- b. lichtsoort A – 4; D50 – 1; D65 – 3; lichtsoort E – 2
- c. lichtsoort A – 1; D50 – 2; D65 – 3; lichtsoort E – 4
- d. lichtsoort A – 2; D50 – 4; D65 – 1; lichtsoort E – 3

Met opmerkingen [PV6]: D50 en D65 verwisselt. D50 is roder dan D65 dus moet meer rood en minder blauw bevatten

Correct answer

KI
H02

13. Gegeven: een aantal stralingsspectra $P(\lambda)$.
Gevraagd: welk spectrum bevat er relatief gezien het meeste blauw licht?
Normaliseer de straling voor 555nm.

- a. Spectrum a
- b. Spectrum b
- c. Spectrum c
- d. Spectrum d

Met opmerkingen [PV7]: Spectra eerst normaliseren voor 550 nm. Dan zie je dat d het hoogst gelegen is tussen 400 en 500 nm.

labels

KI
H02

14. Welk spectrum hoort bij welke lichtsoort?

- a. lichtsoort A – 1; D50 – 3; D65 – 2; lichtsoort E – 4
- b. lichtsoort A – 4; D50 – 1; D65 – 3; lichtsoort E – 2
- c. lichtsoort A – 1; D50 – 2; D65 – 3; lichtsoort E – 4
- d. lichtsoort A – 2; D50 – 4; D65 – 1; lichtsoort E – 3

Met opmerkingen [PV8]: D50 en D65 verwisselt. D50 is roder dan D65 dus moet meer rood en minder blauw bevatten

feedback

KI
H02

15. Gegeven: een aantal stralingsspectra $P(\lambda)$.
Gevraagd: welk spectrum bevat er relatief gezien het meeste blauw licht?
Normaliseer de straling voor 555nm.

- a. Spectrum a
- b. Spectrum b
- c. Spectrum c
- d. Spectrum d

Met opmerkingen [PV9]: Spectra eerst normaliseren voor 550 nm. Dan zie je dat d het hoogst gelegen is tussen 400 en 500 nm.

What did you respond?

- Student can see a copy of the exam with the correct answers and feedback.
- In case of ambiguities, they come back to ask

Not an ideal match

Target audience

Photo- and
colourimetry



Conclusion

- Students appreciate the feedback and the objective and transparent exam
- Efficient way of working for this type of course
- Can blended learning give an answer to “the matching problem”?
- We collect data that may be used for further investigation

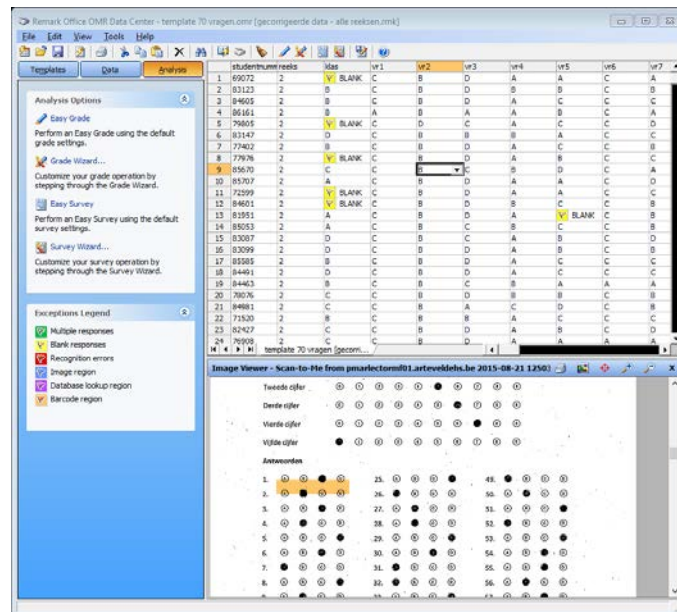


arteveldehogeschool

LID VAN DE ASSOCIATIE UNIVERSITEIT GENT

Thank you

How can you make that analysis?



Condensed Item Analysis Report

reeks

Response	Frequency	Percent	Mean: 1,00
1	54	100,00	
2	0	0,00	
Missing	0	0,00	

vr1

Response	Frequency	Percent	Mean: 2,16
A	9	16,67	
B	6	11,11	
C	28	51,85	
D	11	20,37	
Missing	0	0,00	

vr3

Response	Frequency	Percent	Mean: 2,17
A	11	20,37	
B	30	55,56	
C	6	11,11	
D	7	12,96	
Missing	0	0,00	

vr5

Response	Frequency	Percent	Mean: 2,30
A	9	16,67	
B	23	42,59	
C	19	35,19	
D	3	5,56	
Missing	0	0,00	

vr7

Response	Frequency	Percent	Mean: 3,20
A	3	5,56	
B	14	25,93	
C	6	11,11	
D	31	57,41	
Missing	0	0,00	

vr9

Response	Frequency	Percent	Mean: 2,96
A	1	1,85	
B	0	0,00	
C	53	98,15	
D	0	0,00	
Missing	0	0,00	

klas

Response	Frequency	Percent	Mean: 2,64
A	8	14,81	
B	12	22,22	
C	9	16,67	
D	13	24,07	
Missing	12	22,22	

vr2

Response	Frequency	Percent	Mean: 1,61
A	40	74,07	
B	1	1,85	
C	7	12,96	
D	6	11,11	
Missing	0	0,00	

vr4

Response	Frequency	Percent	Mean: 1,76
A	21	38,89	
B	28	51,85	
C	2	3,70	
D	3	5,56	
Missing	0	0,00	

vr6

Response	Frequency	Percent	Mean: 1,83
A	10	18,52	
B	43	79,63	
C	1	1,85	
D	0	0,00	
Missing	0	0,00	

vr8

Response	Frequency	Percent	Mean: 2,35
A	4	7,41	
B	36	66,67	
C	5	9,26	
D	9	16,67	
Missing	0	0,00	

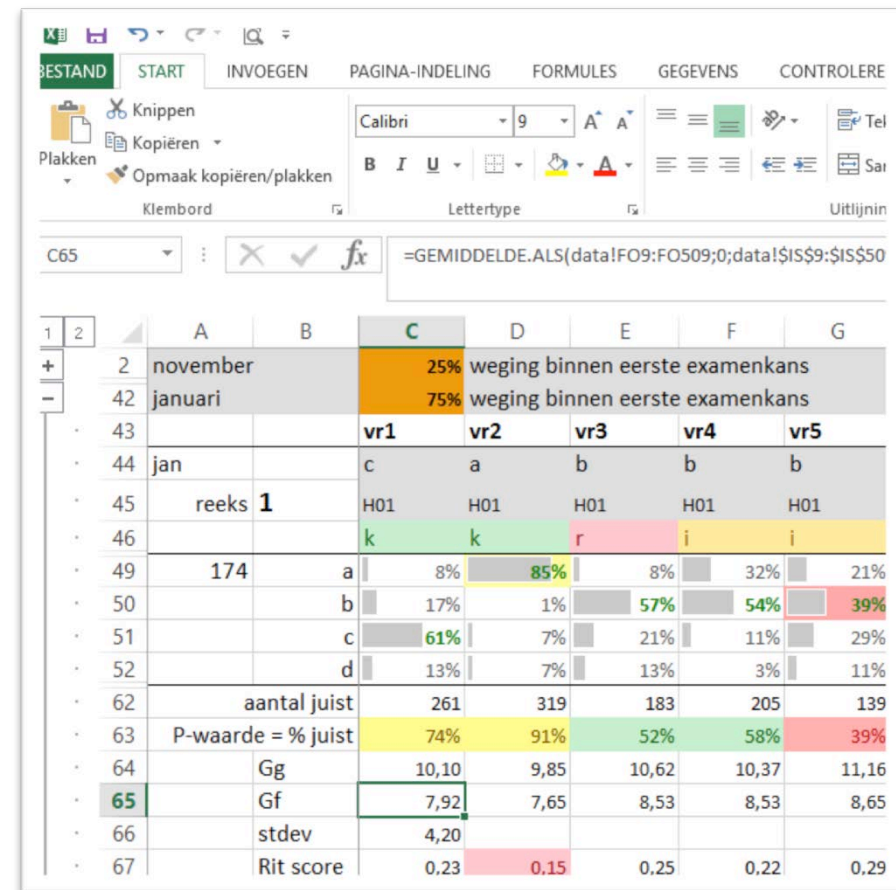
vr10

Response	Frequency	Percent	Mean: 2,57
A	3	5,56	
B	27	50,00	
C	14	25,93	
D	10	18,52	
Missing	0	0,00	

21/09/2015

Condensed Item Analysis Report

Page 1



How can you make a feedback form?



Student Grade Report			
Legend: Incorrect: ☐			
Student: 2345			
	Grade	Total Score	Score (%)
Overall	B	17 / 20	85.00
Learning Objective 1	B	5 / 6	83.33
Learning Objective 2	B	5 / 6	83.33
Responses			
Question	Response	Correct Answer	
Question1	B	A	
Question2	B		
Question3	C		
Question4	D		
Question5	D	E	
Question6	B	D	
Question7	C		
Question	Response	Correct Answer	
Question8	B		
Question9	A		
Question10	B		
Question11	C		
Question12	D		
Question13	E		
Question14	D		
Question	Response	Correct Answer	
Question15	C		
Question16	B		
Question17	A		
Question18	B		
Question19	C		
Question20	D		

- Results of two different exams on one form
- Remark installed on only one computer
- More flexible

