

Cross-fertilization between three different teaching modes for geoinformatics education

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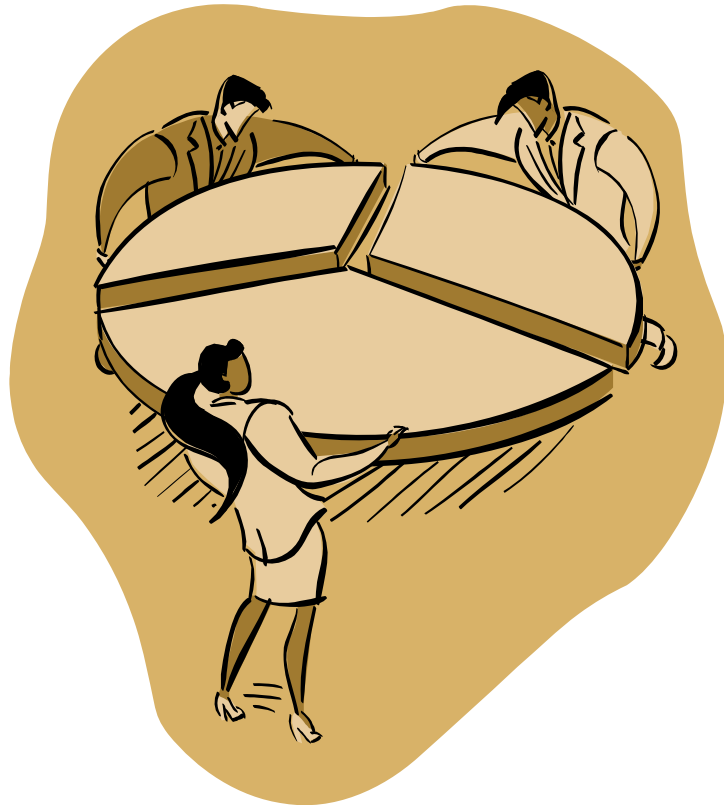
Cross fertilization



Cross-fertilization between three different teaching modes for geoinformatics education

- Cross fertilization can take many shapes of which sharing educational materials is just one
- In this case cross-fertilization was not planned or guided but developed spontaneously
- There are important differences between sharing materials between educational institutes (interoperability) and sharing between courses within the same institute

Teaching modes



- Three different teaching modes:
 - Face to face education
 - Distance learning
 - Blended learning

Cross-fertilization between three different teaching modes for geoinformatics education

Objective



Determine if the use and student appreciation of course materials differs for:

- native materials - foreign materials

The influence on use and student appreciation of the way the material is used:

- compulsory - optional
- interchangeable - only source

Motivation



Re-use of educational materials (within Geo-information Science education) is of particular interest for a number of reasons:

1. datasets are used that are not cheap, and sometimes also difficult to acquire
2. Exercises have to be updated frequently for every new version of the software
3. Geo-information Science, like all IT fields, is developing fast and educational materials get easily outdated

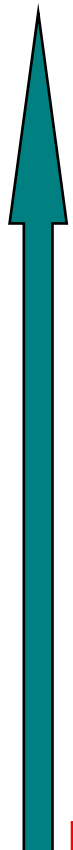
Questions



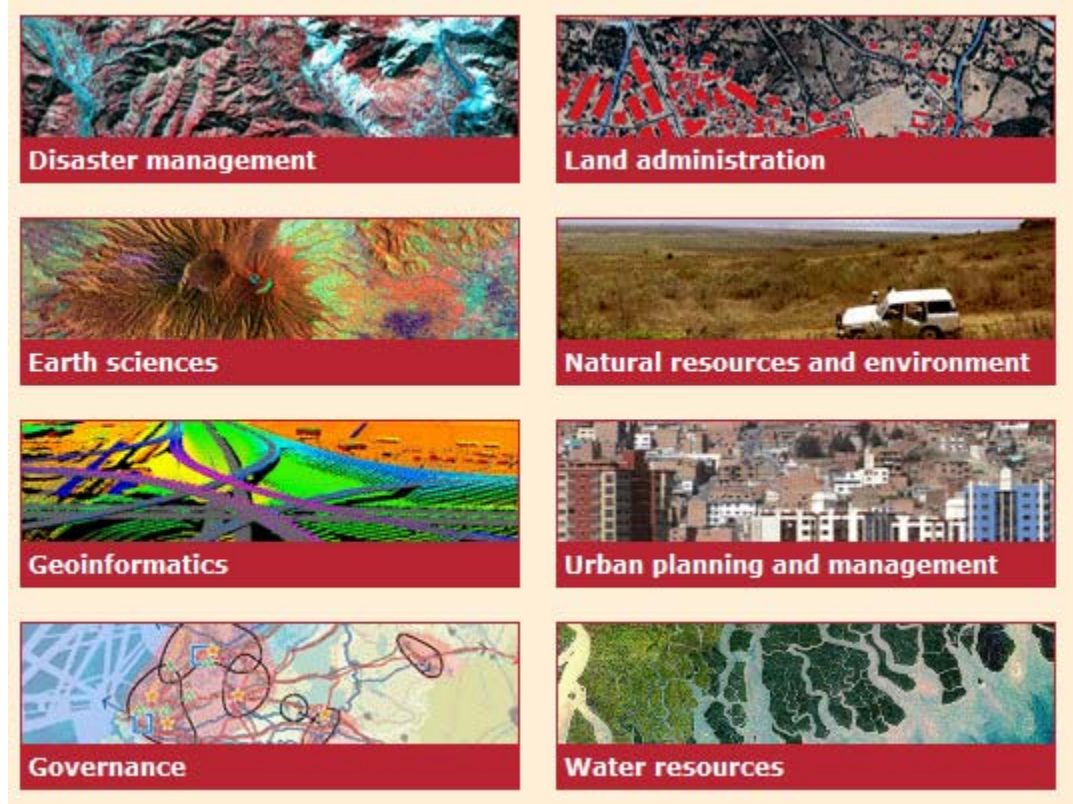
Questions prior to the study:

- How comparable are the courses and how comparable are the participants of these courses?
- Which materials are shared and should be included in this study?

GFM

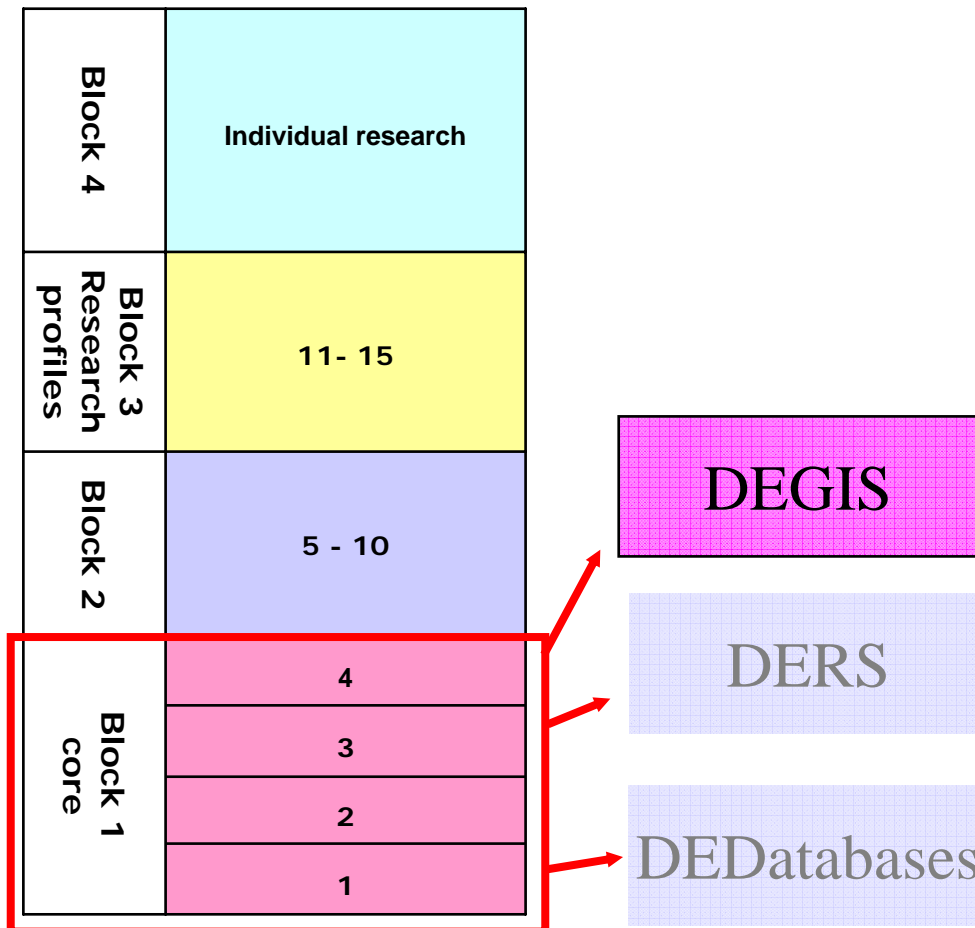
Block 4	Individual research
Block 3 Research profiles	15
	14
	13
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Block 2	10
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	8
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	6
	5
Block 1 core	4
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	1



- Disaster management
- Land administration
- Earth sciences
- Natural resources and environment
- Geoinformatics
- Urban planning and management
- Governance
- Water resources

- 3 week “Introduction to GIS”
- blends theory and practice
- Face to face education
- Weekly study load of 40 hours

Distance (DEGIS)



- ITC offers several modules of their MSc degree courses as distance courses.
- A distance course lasts six weeks and has a weekly study load of 20 hours.
- blends theory and practice.
- Combination of self study with online support by ITC staff.
- Distance courses can be part of an MSc programme.

GIMA



Geographical Information Management and Applications

GIMA



MSc programme
Geographical Information Management and Applications*

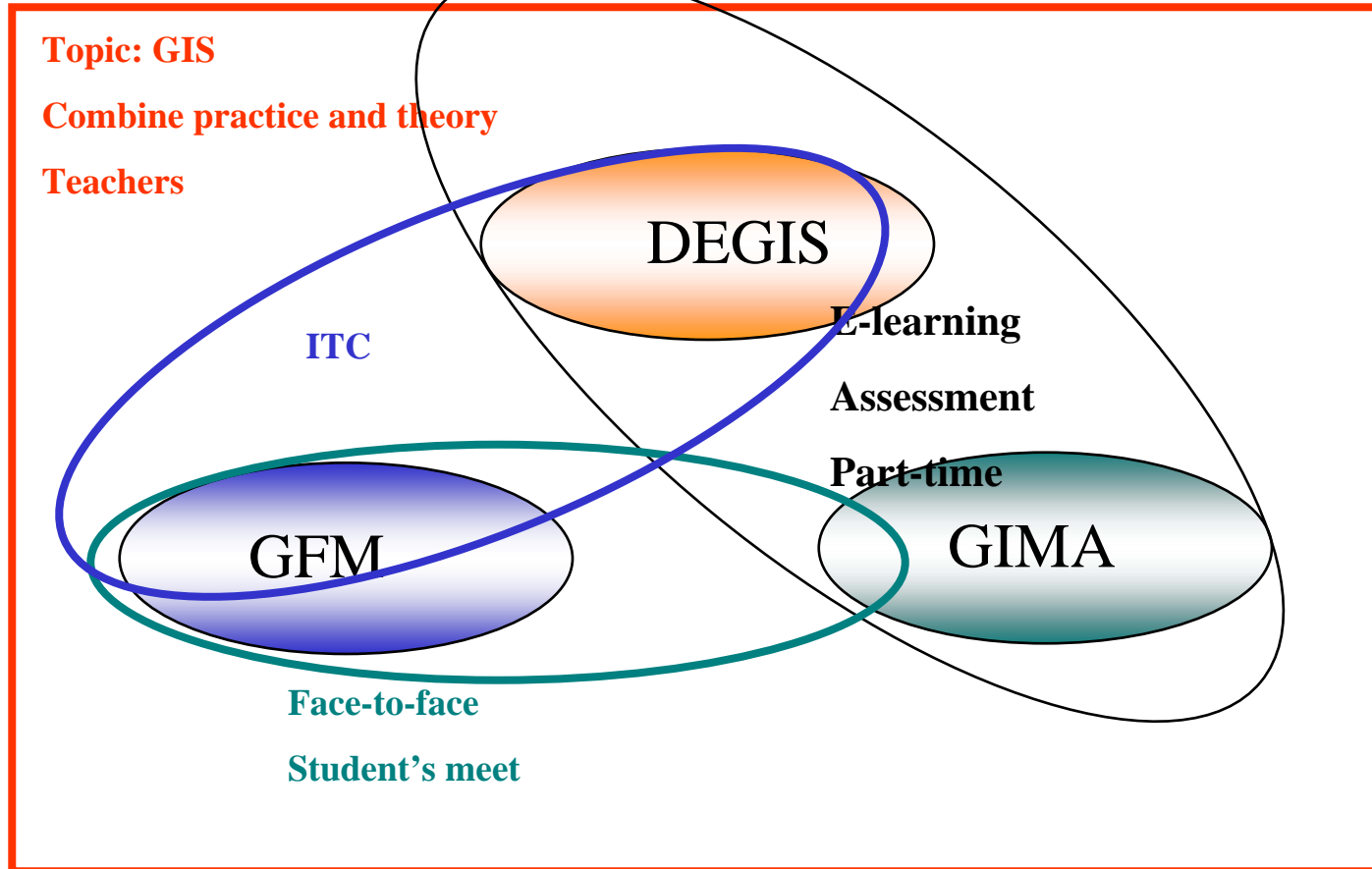


Week 37	Task 1 (part 1) On your way to research	Sept 24
Week 38	Task 2 Determining and mapping position	Oct 1
Week 39	Task 3 Introduction Remote Sensing	Oct 8
Week 40	Task 4a Databases - Geographical data in the computer	Oct 15
Week 41	Task 4b Geographic Information and abst. of reality	Oct 19
Week 42	Catch up week	
Week 43	Task 5a analytical functionality	Nov 5
Week 44	Task 5b analytical modeling	Nov 12
Week 45	Task 6 Visualization	Nov 16
Week 46	Task 1 (part 2) On your way to research	Nov 16

half-time	week 35	week 36 - 49	week 48 - 12	week 11 - 25	full-time
year 1	<i>Introduction</i>	<i>Module 1 methods and techniques</i>	<i>Module 2 basic applications</i>	<i>Module 3 management in organisations</i>	year 1
year 2		<i>Module 4 project management</i>	<i>Module 5 advanced methods and techniques</i>	<i>Module 6 advanced applications</i>	
year 3	<i>Internship</i>				year 2
year 4	<i>Thesis</i>				



Courses



How comparable are the participants?



Continent of origin of the students

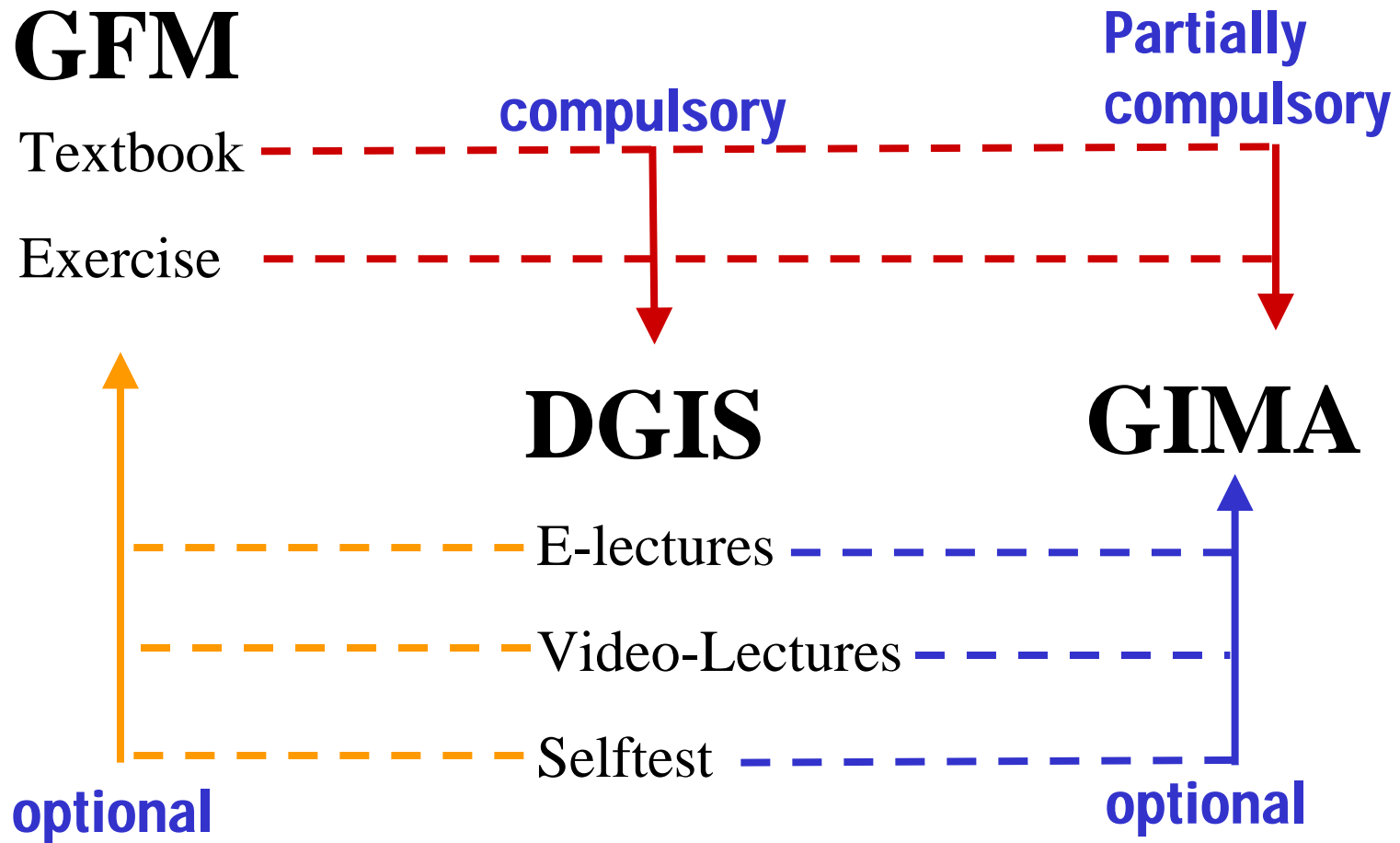
Continent	GFM	DEGIS	GIMA
Africa	18.5 %	82.4 %	0.0 %
Asia	55.6 %	11.8 %	0.0 %
Australia	3.7 %	0.0 %	0.0 %
Europe	11.1 %	5.9 %	100.0 %
North-America	0.0 %	0.0 %	0.0 %
South-America	11.1 %	0.0 %	0.0 %

Prior experience with GIS

	GFM	DEGIS	GIMA
Yes	18.5 %	29.4 %	33.3 %
Some	48.1 %	41.2 %	33.3 %
None	33.3 %	29.4 %	33.3 %

	GFM	DEGIS	GIMA
Part time	3.7 %	82.4 %	66.7 %
Full time	96.3 %	17.6 %	33.3 %

Sharing materials



Method



Method applied includes:

- the comparison of student evaluations
 - Questions only partially matched the objectives of this study
 - Differences between the three courses
- questionnaires
 - Gap between the end of the course and the questionnaires
- statistics from the digital learning environment (Blackboard software was used in all the three teaching methods)
 - Only useful for some of the materials

Evaluation forms



	<i>GFM</i>	<i>DEGIS</i>	<i>GIMA</i>
<i>2007</i>		16	15
<i>2007 (2)</i>		12	
<i>2006</i>	43	16	18
<i>2005</i>	16		
Total	59	44	33

Valid responses per course

- All evaluations were digital evaluations in BB
- Anonymous and filled out at the end of the courses
- The following evaluations were used:
 - GFM 2007 and 2006
 - DEGIS September 2007, February 2007 and 2006
 - GIMA 2006 and 2007

Questionnaire



<i>2007</i>	<i>GFM</i>	<i>DEGIS</i>	<i>GIMA</i>
<i>Number</i>	27	17	6
<i>%</i>	31	29	29
<i>Total</i>	27	17	6

Valid responses per course

- Digital questionnaire identical for all three courses
- All students from 2007 were asked to participate
- Questions were scored on a 5-step scale ranging from ++ to --

Questionnaires will be used as the basis for the comparison.

Use of the materials



Use in percentage (%).

	++			+			+/-			-			--		
	GFM	DEGIS	GIMA	GFM	DEGIS	GIMA	GFM	DEGIS	GIMA	GFM	DEGIS	GIMA	GFM	DEGIS	GIMA
Video-lectures	18	65	67	33	29	17	30	6	17	0	0	0	19	0	0
E-lectures	22	77	33	44	12	50	20	6	17	4	0	0	11	6	0
Self-tests	41	71	67	44	18	33	11	6	0	0	6	0	4	6	0
Text book	78	77	17	19	18	33	4	6	17	0	0	0	0	0	33
ArcGIS exercises	30	71	33	56	18	17	15	0	17	0	6	17	0	6	17
Study guide	7	47	33	67	35	17	11	12	17	7	0	17	7	6	17

High % at the negative (do not use) side of the table


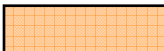
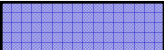
Results - Use



Extent to which the materials were used

	Sum of ++ and +		
	GFM	DEGIS	GIMA
Video lectures	51	94	83
E-lectures	67	88	83
Self-tests	85	88	100
Text book	96	94	50
ArcGIS exercises	85	88	50
Study guide	74	82	50

- All native materials have a high percentage of use
- But some non-native materials also have a very high use like the self-tests

 native  compulsory
 interchangeable



Results - Use

Extent to which the materials were used

	Sum of ++ and +		
	GFM	DEGIS	GIMA
Video lectures	52	94	83
E-lectures	67	88	83
Self-tests	85	88	100
Text book	96	94	50
ArcGIS exercises	85	88	50
Study guide	74	82	50

- All native materials have a high percentage of use
- Most compulsory materials have a high percentage of use. (GIMA scores are relatively low)



native
 compulsory
 interchangeable


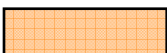



Results - Use



Extent to which the materials were used

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	GFM	DEGIS	GIMA
Video lectures	52	94	83
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Study guide	74	82	50

	native		compulsory
			interchangeable

- All native materials have a high percentage of use
- Most compulsory materials have a high percentage of use. GIMA scores are relatively low
- Some non compulsory materials have a high score (selftests)

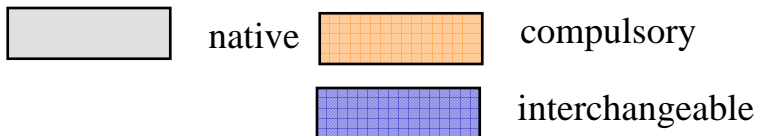


Results - Use



Extent to which the materials were used

	Sum of ++ and +		
	GFM	DEGIS	GIMA
Video lectures	52	94	83
E-lectures	67	88	83
Self-tests	85	88	100
Text book	96	94	50
ArcGIS exercises	85	88	50
Study guide	74	82	50



- All native materials have a high percentage of use.
- Most compulsory materials have a high percentage of use. GIMA scores are relatively low.
- Some non compulsory materials have a high score, especially when they are not-interchangeable.

Results - Student appreciation



Student appreciation in %.

	++			+			+/-			-			--		
	GFM	DEGIS	GIMA	GFM	DEGIS	GIMA	GFM	DEGIS	GIMA	GFM	DEGIS	GIMA	GFM	DEGIS	GIMA
Video-lectures	21	41		50	35		25	24		0	0		4	0	
E-lectures	38	69	67	31	25	33	19	6	0	4	0	0	8	0	0
Self-tests	60	75	17	36	19	50	4	0	17	0	6	0	0	0	0
Text book	80	82	17	20	6	50	0	12	33	0	0	0	0	0	0
ArcGIS exercises	56	65	20	37	24	40	7	6	0	0	6	21	0	0	21
Study guide	17	47	17	67	35	17	13	6	33	4	0	0	0	6	0

High % at the negative (do not appreciate) side of the table

Results - Student appreciation



Appreciation in percentage of total students who used the materials

- All native materials have a high appreciation

	Sum of ++ and +		
	GFM	DEGIS	GIMA
Video lectures	71	77	
E-lectures	69	94	100
Self-tests	96	94	67
Text book	100	88	67
ArcGIS exercises	93	88	60
Study Guide	83	82	33

native
 compulsory
 interchangeable



Results - Student appreciation



Appreciation in percentage of total students who used the materials

	Sum of ++ and +		
	GFM	DEGIS	GIMA
Video lectures	71	77	
E-lectures	69	94	100
Self-tests	96	94	67
Text book	100	88	67
ArcGIS exercises	93	88	60
Study Guide	83	82	33

- All native materials have a high percentage
- Compulsory materials have a relatively high appreciation.

native
 compulsory
 interchangeable

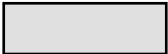
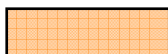
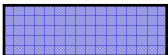


Results - Student appreciation



Appreciation in percentage of total students who used the materials

	Sum of ++ and +		
	GFM	DEGIS	GIMA
Video lectures	71	77	
E-lectures	69	94	100
Self-tests	96	94	67
Text book	100	88	67
ArcGIS exercises	93	88	60
Study Guide	83	82	33

	native		compulsory
			interchangeable

- All native materials have a high percentage
- Compulsory materials have a relatively high appreciation.
- But, some optional materials score (very) high

Results - Student appreciation



Appreciation for the categories in percentage of total students who used the materials

	Sum of ++ and +		
	GFM	DEGIS	GIMA
Video lectures	71	77	
E-lectures	69	94	100
Self-tests	96	94	67
Text book	100	88	67
ArcGIS exercises	93	88	60
Study Guide	83	82	33

native
 compulsory
 interchangeable

- All native materials have a high percentage
- Compulsory materials have a relatively high appreciation.
- But, some optional materials score (very) high
- And, some of these highly appreciated materials are (partially) interchangeable



Experiences related to research method



- Some differences were found between the results of the questionnaires, the course evaluation and the statistics derived from the digital learning environment.
- No “trend” could be found in these discrepancies.

Conclusions - use



- All native materials have a high percentage of use, but some of the foreign materials (self-test) also have a high % of use.
- Compulsory materials have a high percentage of use, exception is the textbook in GIMA.
- In some cases the high % of use can not be explained by the fact that the materials is compulsory or non-interchangeable (self-tests)

Conclusions - appreciation



- In general there is no difference in the appreciation of foreign materials compared to native materials.
- Optional and interchangeable materials have a lower appreciation than compulsory non-interchangeable materials, but.....

.....the score of the optional materials is still considerable (self-tests in GFM and E-lectures in GIMA)

New question?



- The face-to-face and distance students were mainly students for which English is a second language. Can this explain the high appreciation of E-lectures in GFM?
- GIMA students combine a relatively low use of the textbook with a high appreciation for E-lectures. Do they use the optional E-lectures as a substitute for the compulsory textbook?
- Why do students like self tests so much?

New question?



Cross-fertilization between three different teaching modes for geoinformatics education:

- Other types of cross-fertilization
- One specific example of three very similar courses