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# Perceptions of Learning Outcomes and Employability among Forestry Graduates in Finland

Silva Network

Istanbul, 1 November, 2013

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** TTS-research

for·est·ry man·age·ment (n):
managing to cut down forests.

CANADIAN DICTIONARY

MURPHY PROVINCE

Applicants 2003-09

MMEKO

MMEKN

MMVAR

METSÄTIETEET
(mmeko+mmvar)
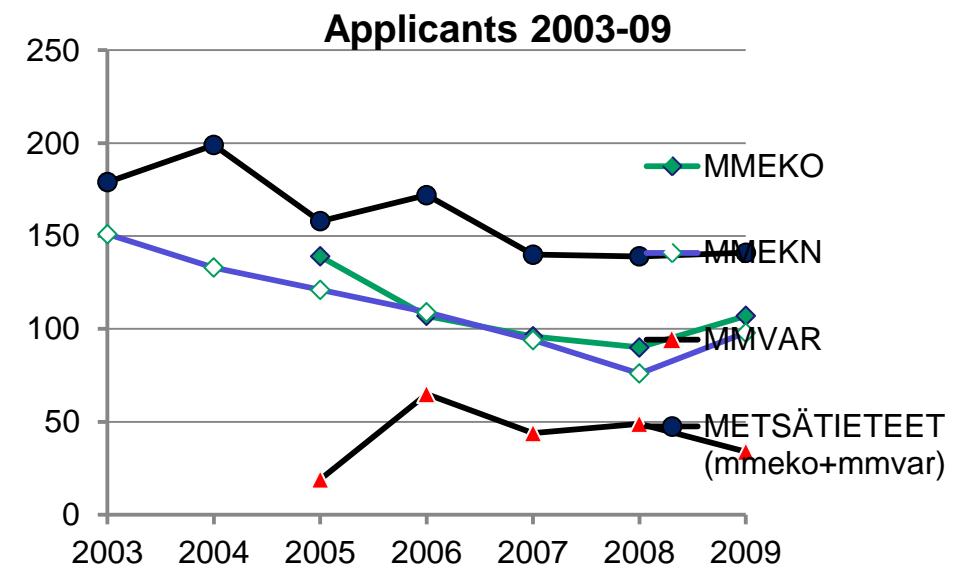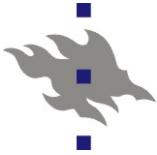
National Prestudy on Forest Education 2013

Quantity

All levels:

vocational,

polytechnics,

university

Practical
recommendations

For example:
more cooperation
between all levels

Content

Marketing

Policy
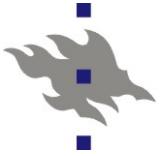
Content

- Study aims
- Framework
- Data
- Method
- Conclusions
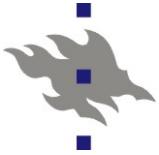
Research questions

1. Which are perceived Learning Outcomes (LOs) by forestry graduates?
2. How forestry graduates have employed?
3. What is relationship between learning outcomes and jobs?
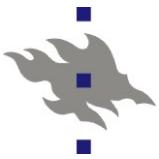
Framework
Learning outcomes

- LEARNING OUTCOMES (intended and not intended):
  - what a learner knows, understands and/or is able to do at the end of a period of learning

Generic Academic Skills　　　　　　**Transferable Skills**

Subject Specific Material
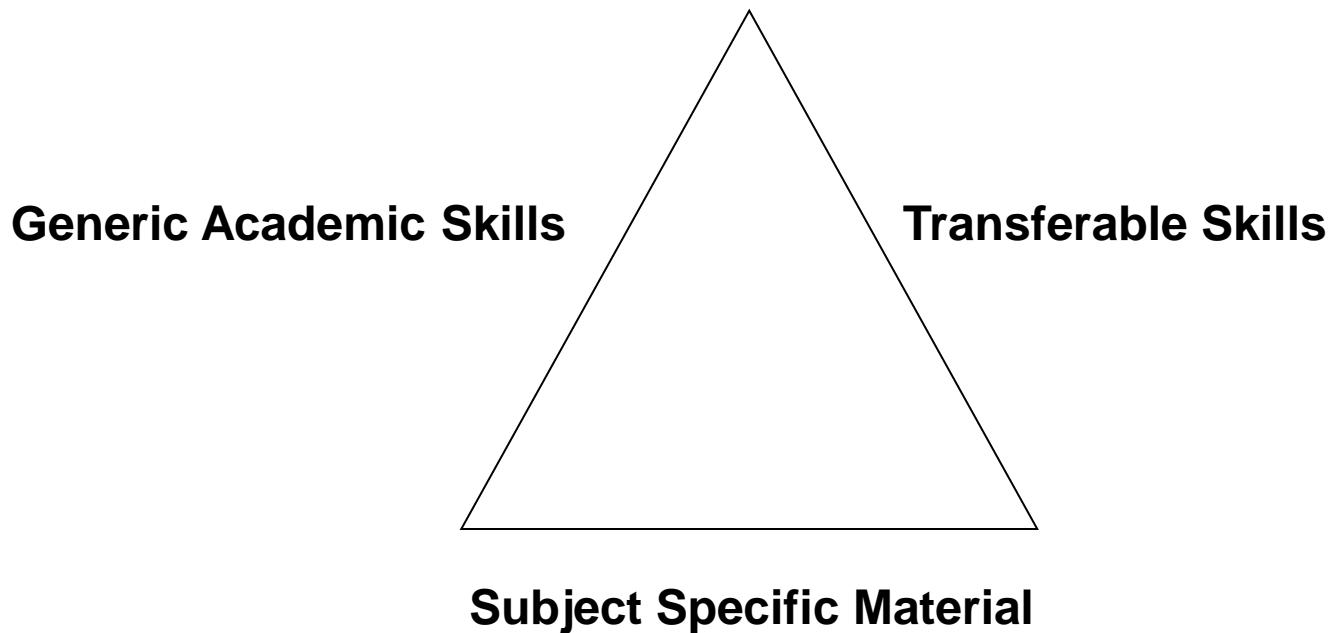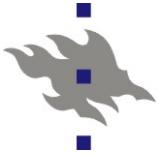
Allan (1996)

Learning outcomes (Allan 1996)

- Generic academic skills
    - analyse
    - organise and structure ideas
    - think critically
    - synthesise ideas and information
- Transferable skills
    - Communicate effectively
    - Organise
    - Gather information
    - Use information technology
    - Act independently
    - Work teams
    - Numeracy
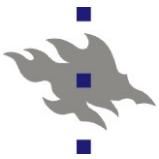
Learning outcomes,
subject specific categories

1. Silviculture
2. Forest Ecology
3. Timber procurement and forest technology
4. Forest industry
5. Forest resource monitoring and management
6. Multiple use of forests
7. Wildlife and game management
8. Forest economics and policy
9. Marketing

c.f. Schuck (2009)
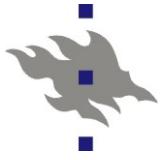
DATA and METHODS
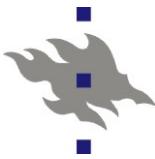
Data
Target group of the study

■ Academic foresters (3+2 years MSc programme) graduated from the University of Helsinki and University of Eastern Finland

■ Forest engineers (4 years BSc) from 6 polytechnics (=Universities of Applied Sciences)

Data

SURVEY
(Email + mail questionnaire)

UNIVERSITY STUDENT REGISTER
(Credits and grades)

DATA

Data

SURVEY
(Email + mail questionnaire)

DATA

Not used in this presentation

UNIVERSITY STUDENT **REGISTER**
(Credits and grades)
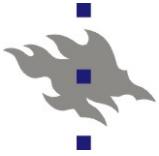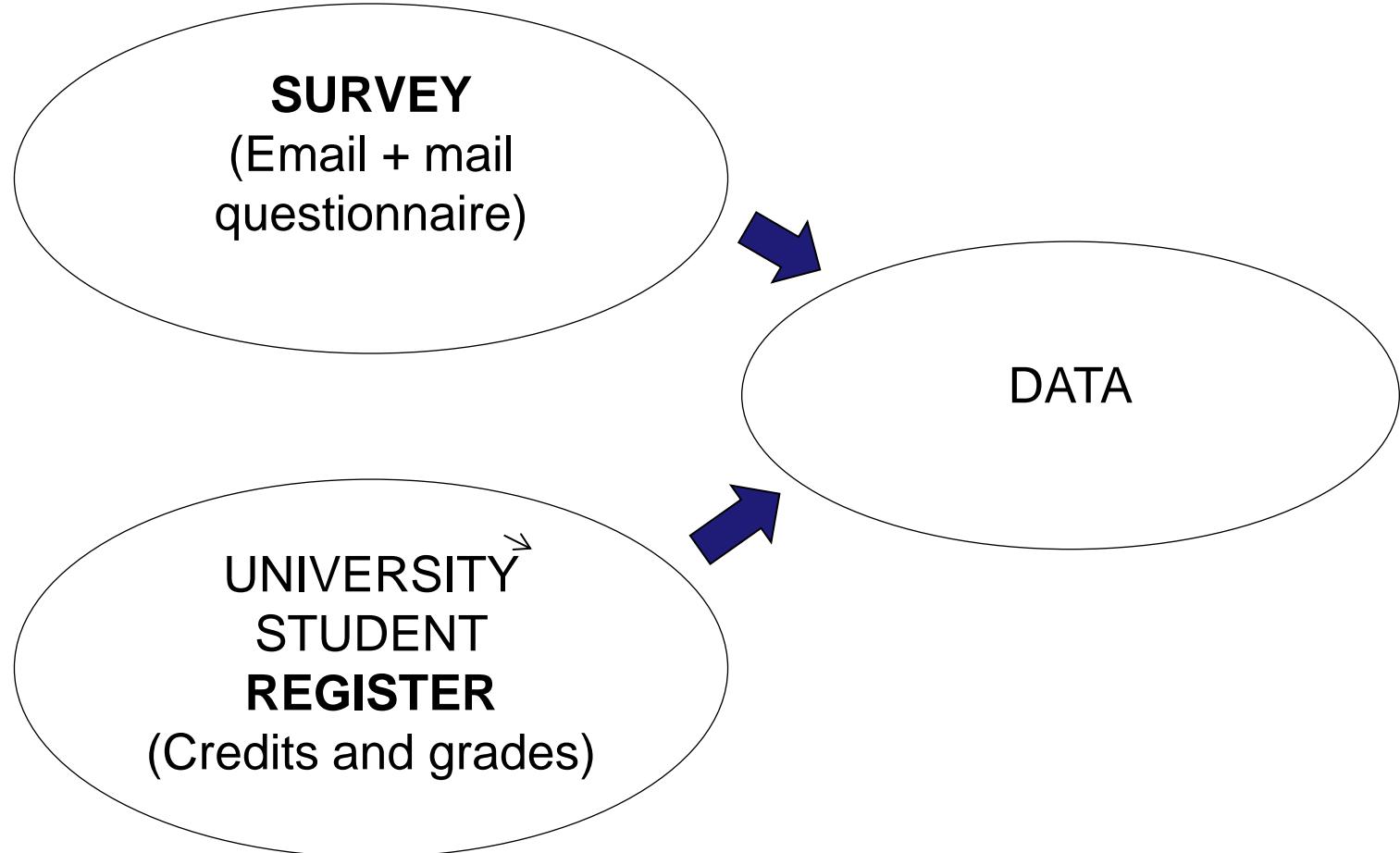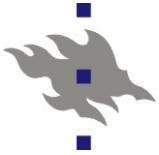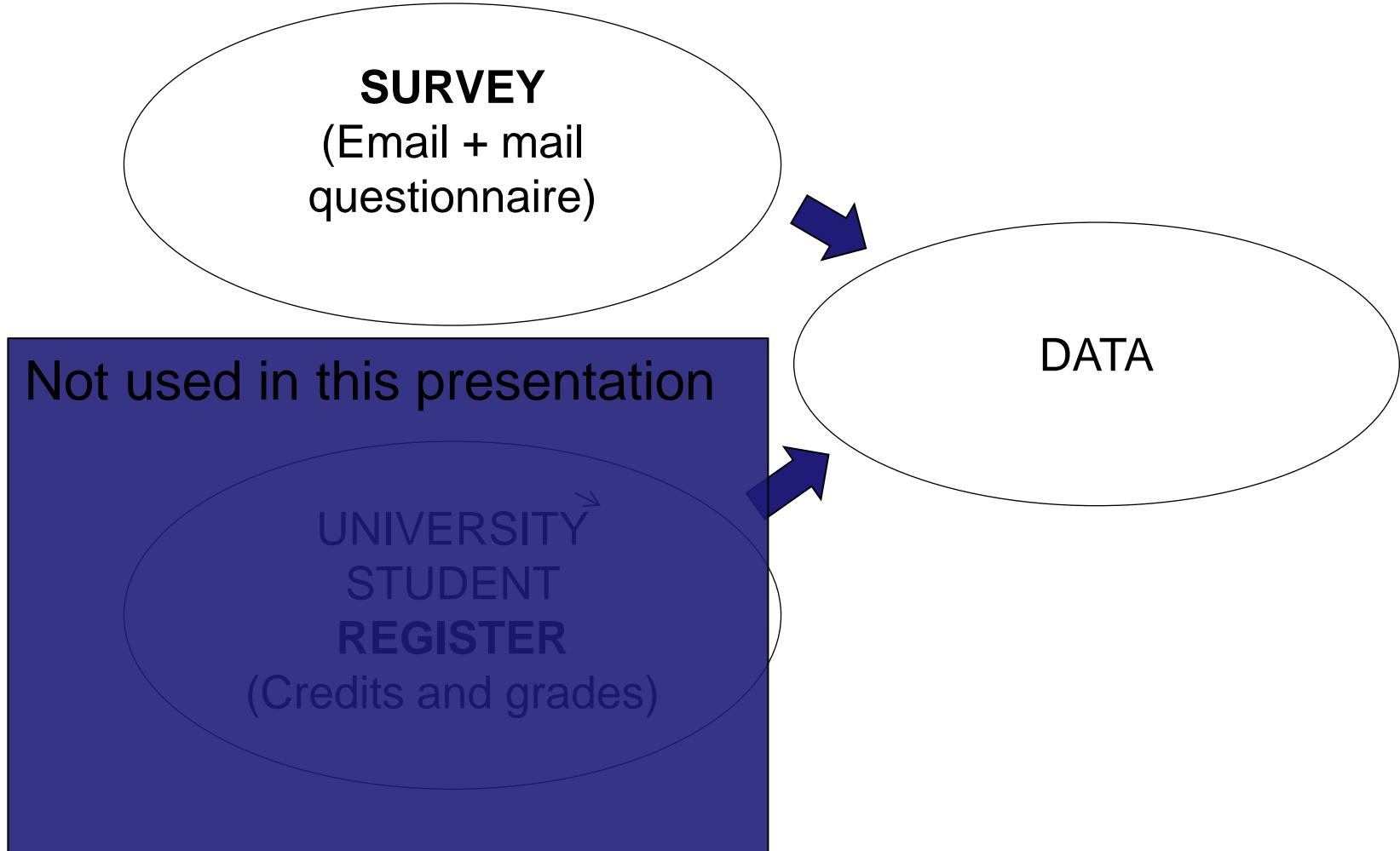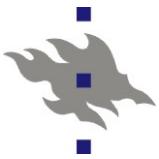
Data: A Survey
Total sample

1. **Graduates from Universities** 2000-2008

   Total sample of graduates

2. **Graduates from Polytechnics** (Un. Of Applied Sciences) 2000-2008

   Sample of Forest engineers **labour union members**
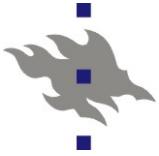
Data

- Internet & mail surveys, autumn 2011
- Dropouts excluded

	MSc	**BSc**	**Total**
Population	971	1929	2900
Sample	971	811	1782
Responses	259	261	520
Response rate	27 %	32 %	29 %
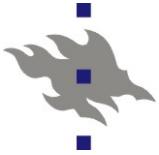
DATA

Concept	Measurement
A. Learning outcomes	
Generic skills	Self evaluation
Academic skills	Self evaluation
Subject Specific skills	Self evaluation
C. Work & education relatedness	
During studies & After studies	Self evaluation
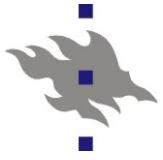
Preliminary results

Satisfaction with studies from the career point of view

	Academic foresters (MSc)		Forest engineers (BSc)	
	n	%	n	%
Extremely unsatisfied	18	7,0	15	5,7
Unsatisfied	27	10,5	21	8,0
Somewhat unsatisfied	45	17,5	47	18,0
Somewhat satisfied	91	35,4	73	28,0
Saisfied	65	25,3	80	30,7
Extremely satisfied	11	4,3	25	9,6
Total	257	100	261	100

Taulukko 27. Tyytyväisyys suoritettuihin opintoihin työuran kannalta

Satisfaction with studies from the career point of view

	Academic foresters (MSc)		Forest engineers (BSc)	
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Extremely unsatisfied	18	7,0	15	5,7
Unsatisfied	27	10,5	21	8,0
Somewhat unsatisfied	45	17,5	47	18,0
Somewhat satisfied	91	35,4	73	28,0
Saisfied	65	25,3	80	30,7
Extremely satisfied	11	4,3	25	9,6
Total	257	100	261	100

61%

68%

Taulukko 27. Tyytyväisyys suoritettuihin opintoihin työuran kannalta
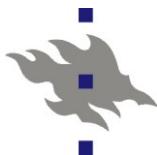
Working during studies, forest engineers (BSc) (%) (n=231)

	Not at all	Little	Some-what	Quite a lot	A lot	Extreme ly lot
Working made studies slower	63,5	14,3	6,1	7,0	5,2	3,9
Working made studies faster	40,9	17,8	16,5	9,1	9,6	6,1
Working improved learning	9,1	6,5	12,9	20,3	26,4	23,8
Working improved my grades	19,5	16,0	16,5	24,2	16,9	6,9
Working decreased my grades	62,0	16,2	11,8	3,9	3,9	2,2
Working improved my employability	11,3	3,9	6,5	11,3	19,5	47,6
Working improved career prospects	16,9	8,7	13,9	16,9	18,2	25,5
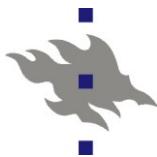
Working during studies, Academic foresters (MSc) (%) (n=97)

	Not at all	Little	Some-what	Quite a lot	A lot	Extremely lot
Working made studies slower	42,3	18,6	8,2	8,2	15,5	7,2
Working made studies faster	50,0	18,8	15,6	6,3	6,3	3,1
Working improved learning	19,6	9,3	14,4	30,9	17,5	8,2
Working improved my grades	35,1	18,6	28,9	10,3	6,2	1,0
Working decreased my grades	49,5	17,5	14,4	8,2	8,2	2,1
Working improved my employability	12,4	11,3	11,3	9,3	22,7	33,0
Working improved career prospects	19,6	18,6	12,4	8,3	18,6	22,7
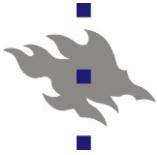
First job the same as the one during studies

	Yes		No		Total	
	n	%	n	%	n	%
Academic foresters (MSc)	147	**56,8**	112	43,2	259	100
Forest engineers (BSc)	132	**51,2**	126	48,8	258	100

Current job the same as the first one

	Yes		No		Total	
	n	%	n	%	n	%
Academic foresters (MSc)	49	**18,9**	210	81,1	259	100
Forest engineers (BSc)	59	**23,2**	195	76,8	254	100

Current working position

	Working in a forest sector		Woring in a sector related to forests		Working in other sectors		Total	
	n	%	n	%	n	%	n	%
Academic foresters (MSc)	134	53,4	50	19,9	67	26,7	251	100
Forest engineers (BSc)	218	86,9	21	8,4	12	4,7	251	100

Considerble large variation among universities of applied sciences
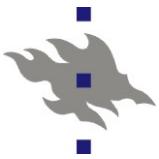
Quantitative matching of the education (work is at lower level than education)
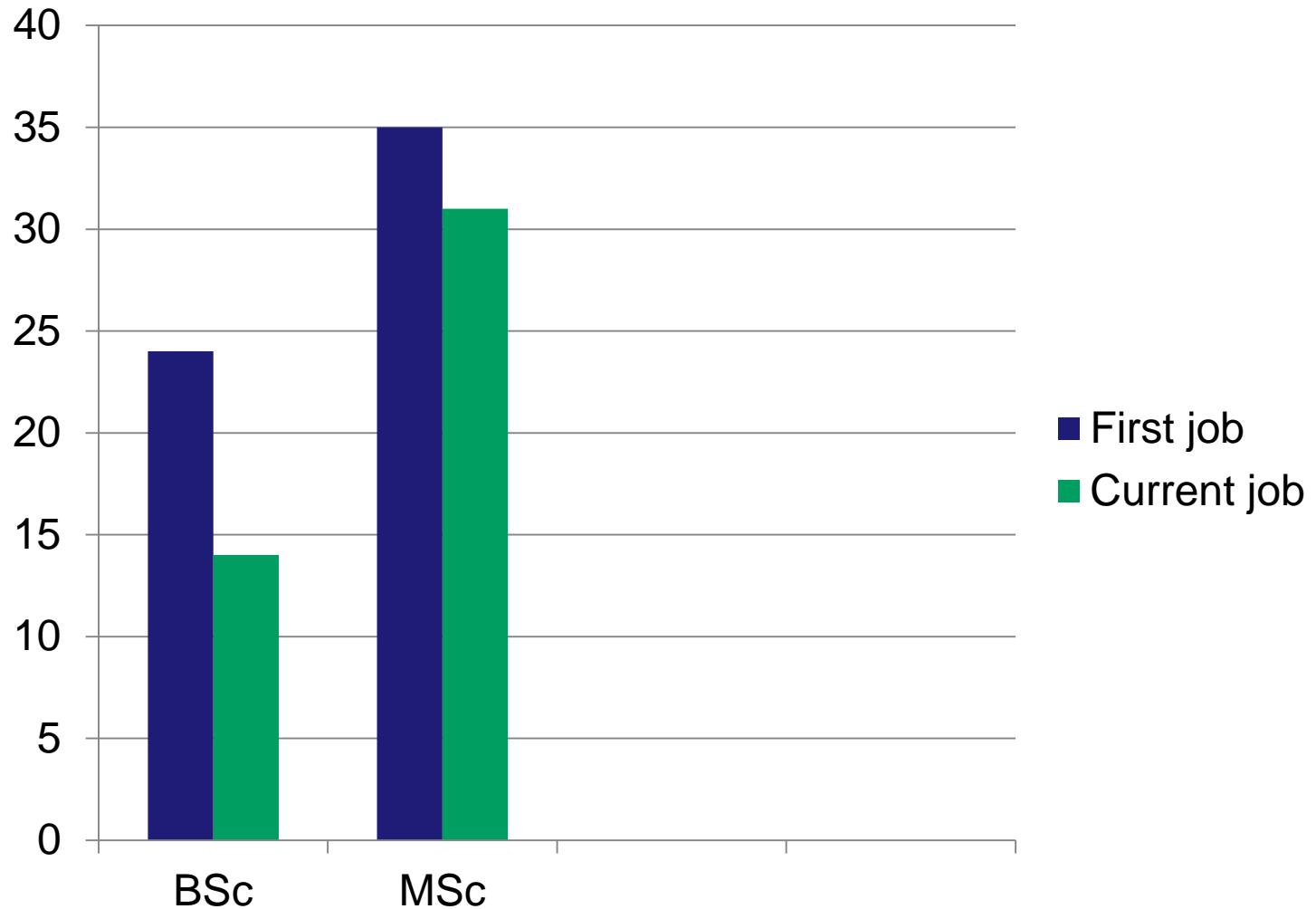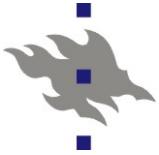
Reasons for working in a position that does not match with education

	Academic foresters (MSc)		Forest engineers (BSc)	
	n	%	n	%
I am continuing in the position where I was during my studies	142	57,7	193	83,5
I have not been able to find a job matching my education	28	11,4	9	3,9
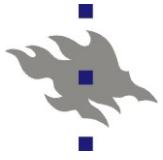
Learning outcomes (LOs)
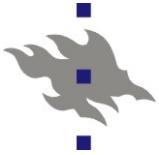
Learning outcomes (LO)

- Altogether 29 learning outcomes (competences) were measured using 1-6 Likert scale
- Explorative Factor analysis of all 29 LOs Produced 7 factors

Learning outcomes	Factors						
	academic skills	independent working	leadership	communication	problem solving	international affairs	time management
Team work and social networking	0.059	0.335	0.189	0.480	0.047	0.084	0.343
Organisational and coordination	0.016	0.230	0.308	0.236	0.261	0.066	0.493
Legislation	0.067	0.138	0.495	0.063	0.058	-0.145	0.114
Financing and budgeting	0.140	0.068	**0.730**	0.017	0.114	0.049	0.121
Entrepreneurship	0.123	0.046	**0.660**	0.108	0.088	0.011	0.026
Leadership	0.126	0.309	**0.557**	0.158	0.083	-0.008	0.063
Project management	0.254	0.205	0.389	0.194	0.062	0.280	0.284
Time management	0.033	0.309	0.230	0.071	0.173	0.043	**0.537**
Decision making	0.054	**0.620**	0.267	0.127	0.343	0.016	0.140
Responsibility	0.100	**0.732**	0.190	0.145	0.307	0.060	0.072
Trust	0.175	**0.557**	0.018	0.147	0.159	0.009	0.312
Stress tolerance	0.085	**0.508**	0.345	0.161	0.200	0.079	0.219
working life skills	0.328	0.398	0.189	0.141	-0.109	-0.059	0.144
IT	0.298	0.130	0.106	0.169	0.146	0.050	0.392
Foreign language communication	0.234	-0.021	-0.109	0.144	0.055	**0.747**	0.139
Presentation	0.193	0.126	0.204	**0.678**	0.128	0.209	0.095
International affairs	0.296	0.081	0.003	0.202	0.033	**0.903**	0.008
Oral communication	0.145	0.214	0.133	**0.842**	0.173	0.157	0.178
Written communication	0.438	0.115	-0.016	0.308	0.086	0.142	0.342
Information processing	**0.494**	0.072	0.088	0.281	0.216	0.140	0.449
Analysis & synthesis	**0.670**	-0.066	0.167	0.167	0.023	0.087	0.255
Research methods	**0.650**	-0.066	0.167	0.023	0.087	0.255	0.004
Practical applications	0.381	0.220	0.264	0.198	0.414	0.022	0.111
Critical thinking	0.424	0.263	0.070	0.127	0.300	0.024	0.003
Creativity	0.353	0.169	0.220	0.167	0.429	0.015	0.084
Ethics	0.411	0.179	0.080	0.041	0.070	0.055	0.083
Independent working	0.093	0.354	0.044	0.097	**0.472**	-0.009	0.319
Problem solving	0.182	0.245	0.180	0.099	**0.689**	0.082	0.211
Information acquisition	0.398	0.168	0.065	0.065	0.405	0.132	0.316
Explanation (%)	9,306	8,868	8,415	6,968	6,486	6,162	6,065

| Learning outcomes	Factors						
	academic skills	independent working	leadership	communication	problem solving	international affairs	time management
Financing and budgeting	0.140	0.068	**0.730**	0.017	0.114	0.049	0.121
Entrepreneurship	0.123	0.046	**0.660**	0.108	0.088	0.011	0.026
Leadership	0.126	0.309	**0.557**	0.158	0.083	-0.008	0.063
Time management	0.033	0.309	0.230	0.071	0.173	0.043	**0.537**
Decision making	0.054	**0.620**	0.267	0.127	0.343	0.016	0.140
Responsibility	0.100	**0.732**	0.190	0.145	0.307	0.060	0.072
Trust	0.175	**0.557**	0.018	0.147	0.159	0.009	0.312
Stress tolerance	0.085	**0.508**	0.345	0.161	0.200	0.079	0.219
Foreign language communication	0.234	-0.021	-0.109	0.144	0.055	**0.747**	0.139
Presentation	0.193	0.126	0.204	**0.678**	0.128	0.209	0.095
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Oral communication	0.145	0.214	0.133	**0.842**	0.173	0.157	0.178
Information processing	**0.494**	0.072	0.088	0.281	0.216	0.140	0.449
Analysis & synthesis	**0.670**	-0.066	0.167	0.167	0.023	0.087	0.255
Research methods	**0.650**	-0.066	0.167	0.023	0.087	0.255	0.004
Independent working	0.093	0.354	0.044	0.097	**0.472**	-0.009	0.319
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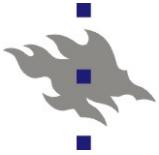
- Academic foresters evaluated their own skills higher than forest engineers with these (statistically different):
    - academic skills
    - communication skills
    - international affairs.
- Some evaluation of skills such as leadership were higher among forest engineers, however these were not statistically significant.
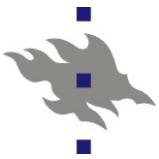
Self-evaluation of LOs and importance by Forest Engineers (BSc)
Forest subject related LOs (scale 1-6)

Self-evaluation of LOs and importance by Academic foresters (MSc)
Forest subject related LOs

BSc
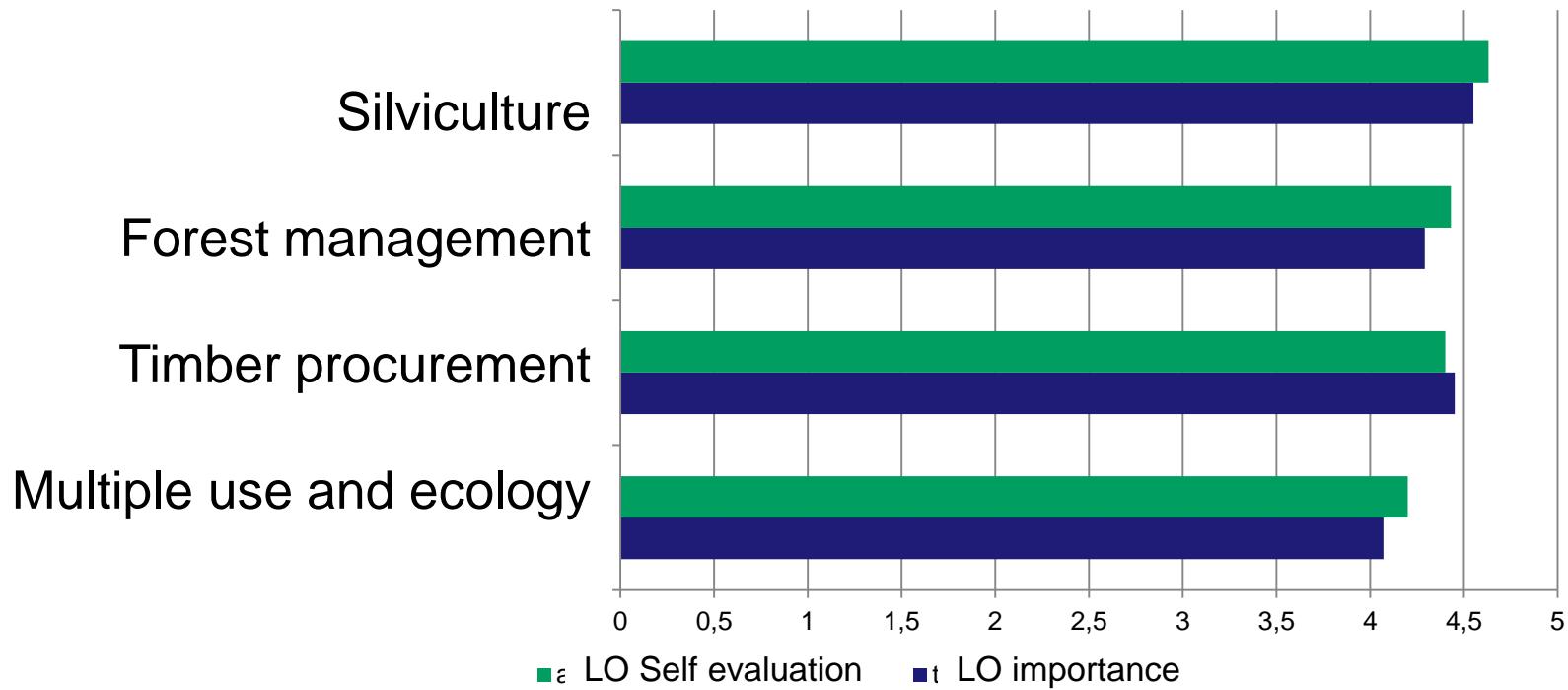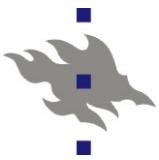
Legend: LO Self evaluation — LO importance
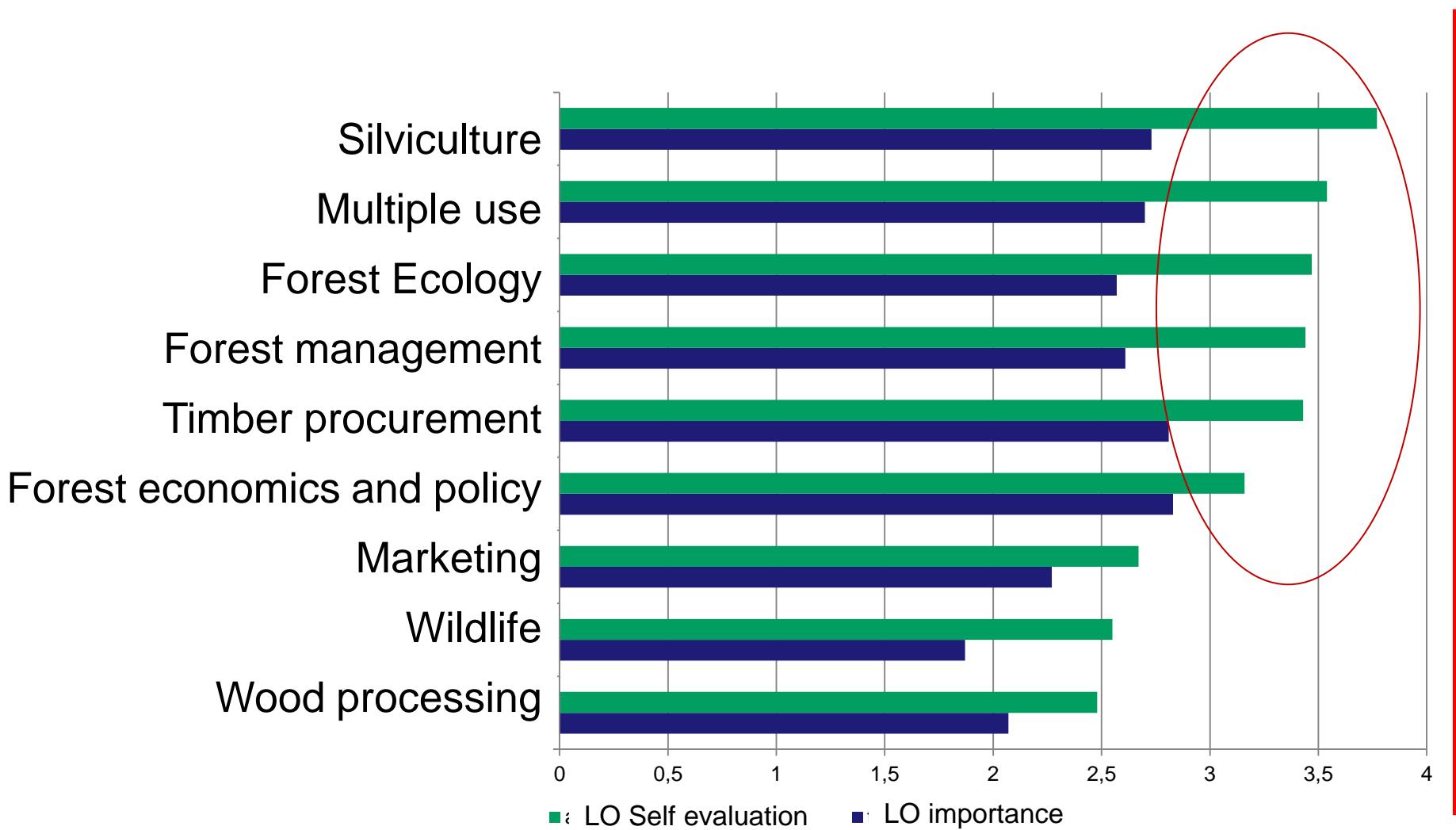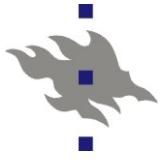
Discussion and Conclusions
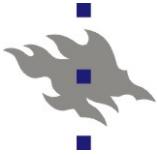
Conclusions

- **Forest engineers (BSc)**
  - working positions very much related to the forest sector
  - start from bottom, later having demanding jobs
- **Academic foresters (MSc)**
  - Working during studies not so useful for learning
  - Work more often outside forest sector
  - ->lower need for forest related LOs

?

Thank you for your attention!
Contact: mika.rekola@helsinki.fi

Metsäekologia pääaineena

■ ei lainkaan/vain vähän   ■ jonkin verran/melko tärkeä   tärkeä/erittäin tärkeä

	ei lainkaan/vain vähän	jonkin verran/melko tärkeä	tärkeä/erittäin tärkeä
puunjalostus	74,6	18,6	6,8
puumarkkinatiede	79,7	20,3	0
metsäekonomia ja -politiikka	57,6	27,1	15,3
metsä- ja riistaeläintiede	67,8	22,1	10,1
metsien monikäyttö	50,9	28,7	20,4
metsänarviointi ja metsäsuunnittelu	62,7	15,2	22,1
puunhankinta ja puunkorjuu	64,4	13,5	22,1
metsäekologia	45,8	23,7	30,5
metsänhoito	55,8	18,7	25,5

Metsävaratiede ja -teknologia pääaineena

■ ei lainkaan/vain vähän　　■ jonkin verran/melko tärkeä　　tärkeä/erittäin tärkeä

	ei lainkaan/vain vähän	jonkin verran/melko tärkeä	tärkeä/erittäin tärkeä
puunjalostus	85	15	0
puumarkkinatiede	85	5	10
metsäekonomia ja -politiikka	60	15	25
metsä- ja riistaeläintiede	90	5	5
metsien monikäyttö	35	35	30
metsänarviointi ja metsäsuunnittelu	20	35	45
puunhankinta ja puunkorjuu	45	35	20
metsäekologia	55	25	20
metsänhoito	55	45	0

Metsäekonomia pääaineena

■ ei lainkaan/vain vähän ■ jonkin verran/melko tärkeä tärkeä/erittäin tärkeä

	ei lainkaan/vain vähän	jonkin verran/melko tärkeä	tärkeä/erittäin tärkeä
puunjalostus	76,9	19,3	3,8
puumarkkinatiede	53,9	30,7	15,4
metsäekonomia ja -politiikka	26,9	57,7	15,4
metsä- ja riistaeläintiede	88,9	7,9	3,2
metsien monikäyttö	65,3	23	11,7
metsänarviointi ja metsäsuunnittelu	69,2	26,9	3,9
puunhankinta ja puunkorjuu	64	20	16
metsäekologia	72	16	12
metsänhoito	65,3	30,8	3,9

Quantitative matching of the education and the first job

	Academic foresters (MSc)		Forest engineers (BSc)	
	n	%	n	%
The work was on a considerably lower level than my studies	58	24,2	92	35,2
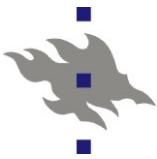
Quantitative matching of the education and the current job

	Academic foresters (MSc)		Forest engineers (BSc)	
	n	%	n	%
The work is on a considerably lower level than my studies	25	9,7	18	6,9
The work is on a somewhat lower level than my studies	55	21,4	18	6,9
The work is on a same level as my studies	143	55,6	150	57,7
The work is on a higher level than my studies	34	13,2	74	28,5
Total	257	100	260	100
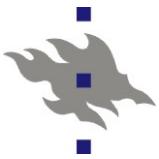
Self-evaluation of LOs and importance by Forest Engineers (BSc)
Forest subject related Los (scale 1-6)

Self-evaluation of LOs and importance by Academic foresters (MSc) Forest subject related LOs

Subject	LO Self evaluation	LO importance
Silviculture	3.8	2.75
Multiple use	3.55	2.7
Forest Ecology	3.5	2.6
Forest management	3.45	2.6
Timber procurement	3.45	2.8
Forest economics and policy	3.15	2.85
Marketing	2.65	2.25
Wildlife	2.55	1.85
Wood processing	2.5	2.05
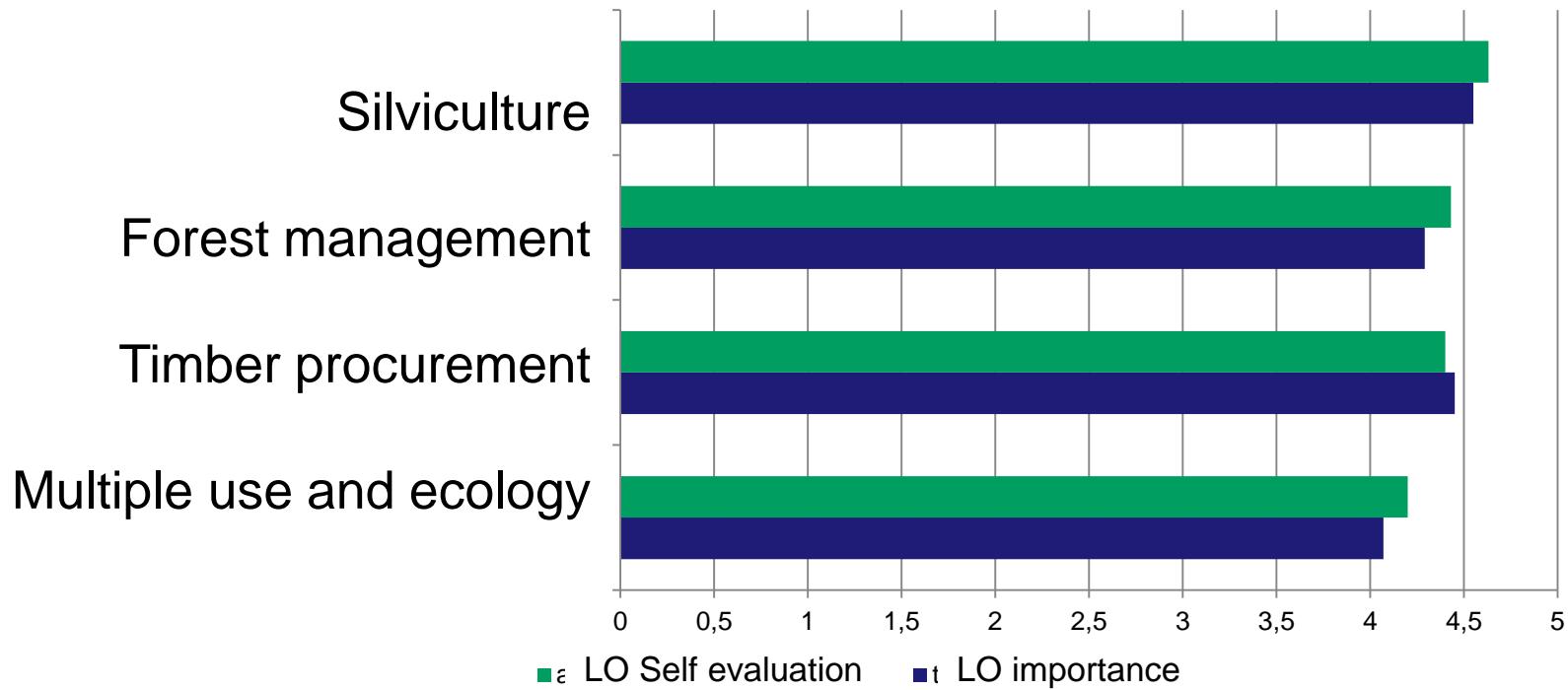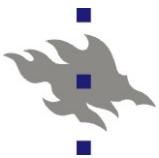
■ LO Self evaluation   ■ LO importance
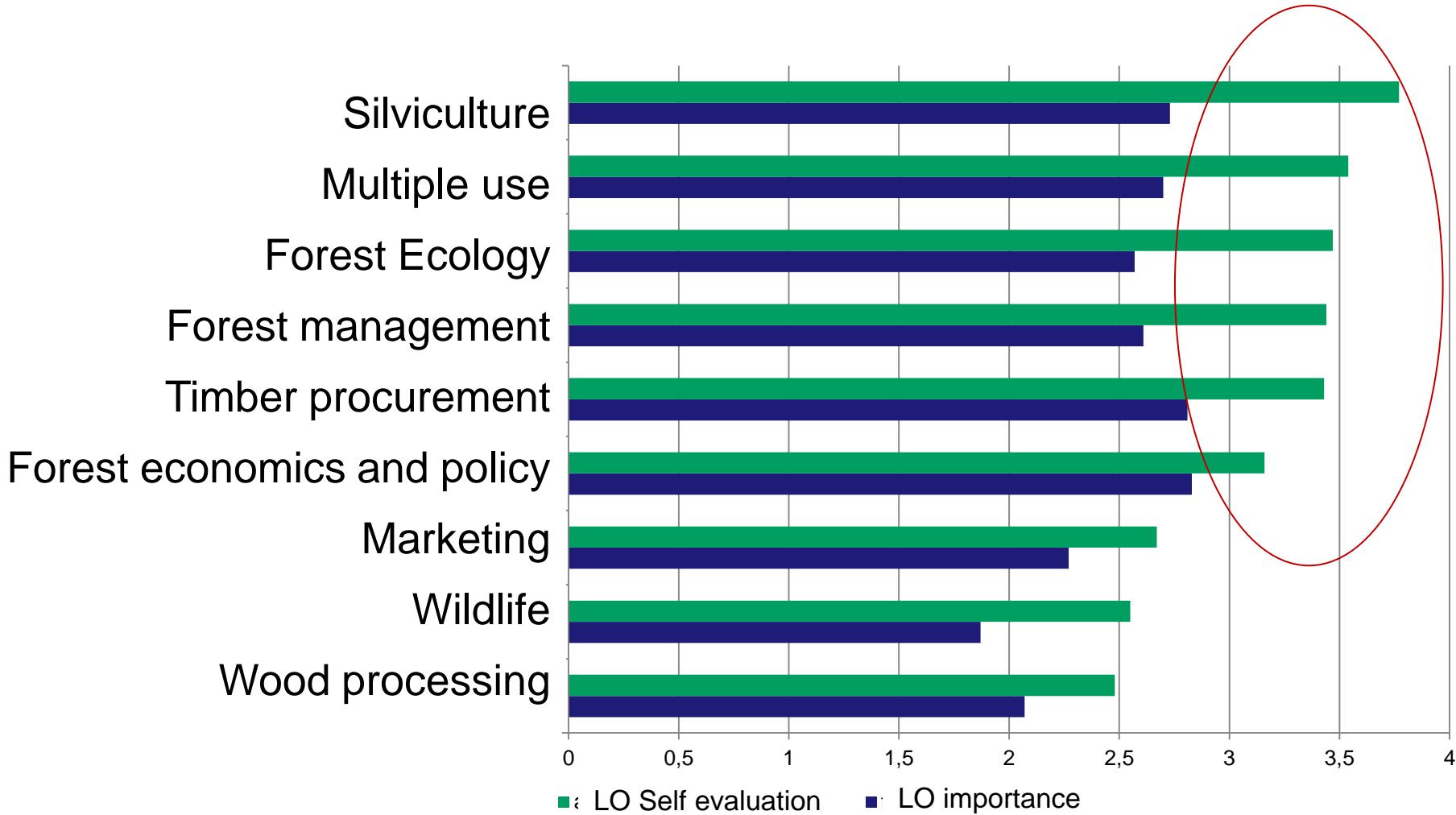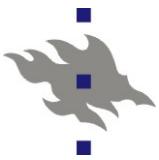
Self-evaluation of LOs and importance by Academic foresters (MSc) Forest subject related LOs
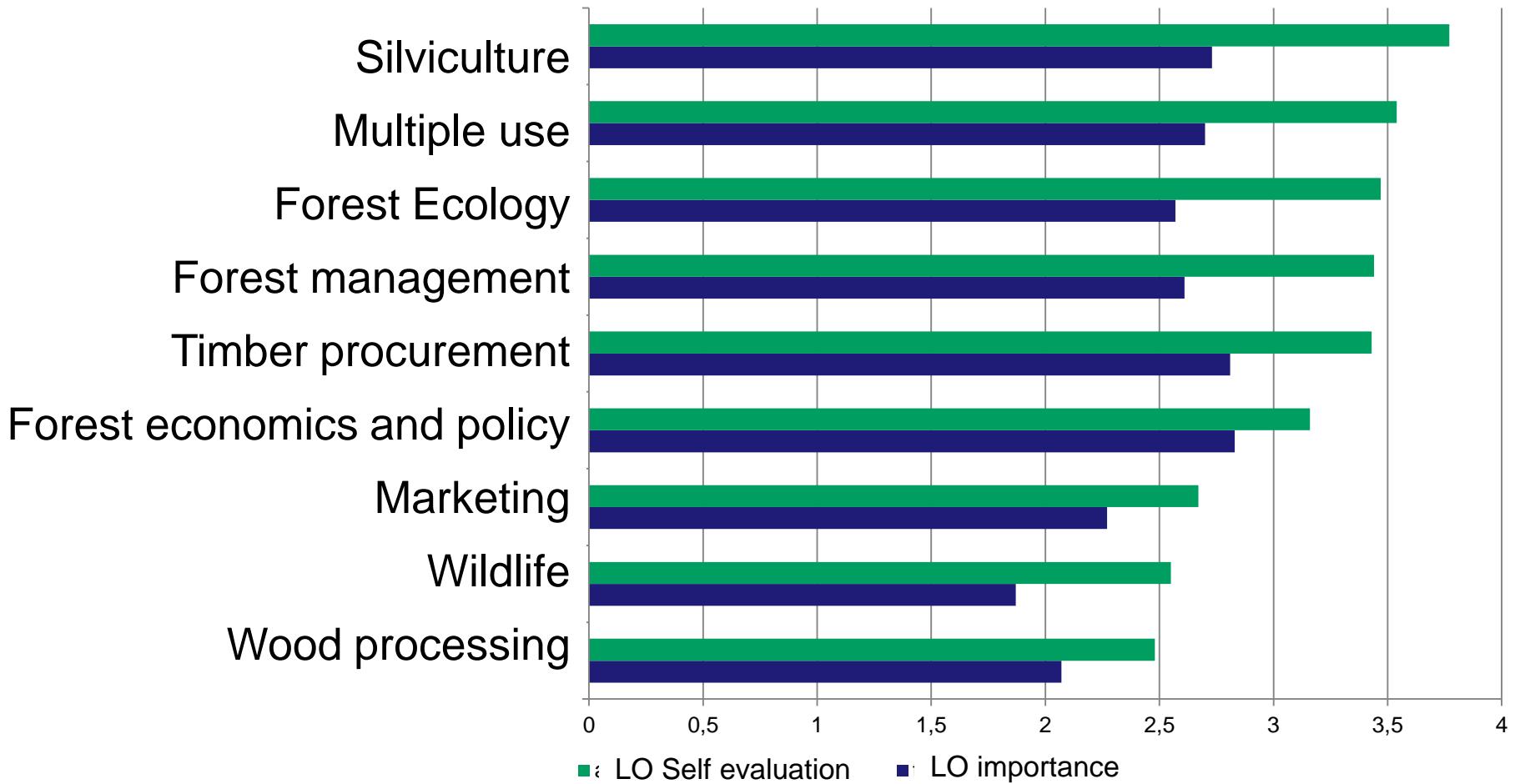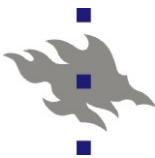
Self-evaluation of LOs and importance by Forest Engineers (BSc) by working sector Forest subject related LOs

Self-evaluation of LOs and importance by Academic foresters (MSc) Forest subject related LOs

n=259

Taito	Arvo
kyky itsenäiseen työskentelyyn	5,34
luotettavuus	5,32
taito suunnitella ja hallita ajankäyttöä	5,16
organisointi- ja koordinointitaidot	5,11
ongelmanratkaisutaidot	5,07
vastuunottokyky	5,05
ryhmätyö- ja sosiaaliset taidot	5
tiedonhankintataidot	4,91
paineensietokyky	4,9
kirjallisen viestinnän taidot	4,84
suullisen viestinnän taidot	4,84
päätöksentekokyky	4,83
informaation käsittelytaidot	4,8
tieto- ja viestintätekniikan taidot	4,79
esiintymistaidot	4,65
taito soveltaa tietoa käytäntöön	4,55
projektinhallintataidot	4,39
kriittisyys ja kyky itsekriittisyyteen	4,37
alaistaidot	4,15
analyysin ja synteesin tekotaidot	4,01
luovuus	3,88
viestintä vieraalla kielellä	3,84
lainsäädännön tuntemus	3,73
taloussuunnittelu ja budjetointi	3,67
eettinen sitoutuminen	3,6
kyky työskennellä kansainvälisessä…	3,51
esimiestaidot	3,37
yritystoiminnan perusteiden tuntemus	3,25
metsäekonomia ja -politiikka	2,83
puunhankinta ja puunkorjuu	2,81
tutkimusmenetelmiin liittyvät taidot	2,78
metsänhoito	2,73
metsien monikäyttö	2,7
metsänarviointi ja metsäsuunnittelu	2,61
metsäekologia	2,57
puumarkkinatiede	2,27
puunjalostus	2,07
metsä- ja riistaeläintiede	1,87

Asteikko:
1= ei merkitystä
2=vähäinen merkitys
3=jonkin verran
4=melko paljon
5= paljon
6=erittäin tärkeä

Forest engineers (BSc) self evaluation of LOs
n=261

luotettavuus	5,35
kyky itsenäiseen työskentelyyn	5,34
vastuunottokyky	4,93
ongelmanratkaisutaidot	4,78
tiedonhankintataidot	4,73
tieto- ja viestintätekniikan taidot	4,71
päätöksentekokyky	4,68
ryhmätyö- ja sosiaaliset taidot	4,66
metsänhoito/puuntuottaminen	4,63
paineensietokyky	4,6
organisointi- ja koordinointitaidot	4,58
taito suunnitella ja hallita ajankäyttöä	4,53
taito soveltaa tietoa käytäntöön	4,49
kriittisyys ja kyky itsekriittisyyteen	4,45
metsänarviointi ja metsäsuunnittelu	4,43
puunhankinta ja puunkorjuu	4,4
kirjallisen viestinnän taidot	4,37
suullisen viestinnän taidot	4,36
informaation käsittelytaidot	4,34
alaistaidot	4,25
metsäluonnonhoito ja ekologia	4,2
luovuus	4,09
esiintymistaidot	4,02
eettinen sitoutuminen	3,98
esimiestaidot	3,92