

Evolution, teaching and assessment of students in pre-service primary school teacher education.

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Problems:

**Misconceptions in the use of terminology
describing evolutionary theories.**

In the Swedish curriculum for the compulsory school one of the *aim* of biology education is that the student should:

“get an insight into the world view of science with the theory of evolution as a foundation”

One of the *core content* of biology education for the compulsory school year 6 is:

Development of life and adaptation of organisms to different habitats

One of the *core content* of biology education for the compulsory school year 9 is:

Comparisons from an evolutionary perspective between man and other organisms.

Evolutionary mechanisms and their outcomes, and also heredity and the relationship between heredity and the environment.

One of the *knowledge requirement* of biology education in compulsory school year 6 is:

“pupils can *talk* about the development of life and *give examples* of the adaptation of organisms to different living environments”.

**Important to teach evolutionary theories
in biology education of pre-service
primary school teacher program.**

**Do the student use evolutionary concepts
when explaining evolution?**

Are the students able to explain evolution without using specific evolutionary concepts?

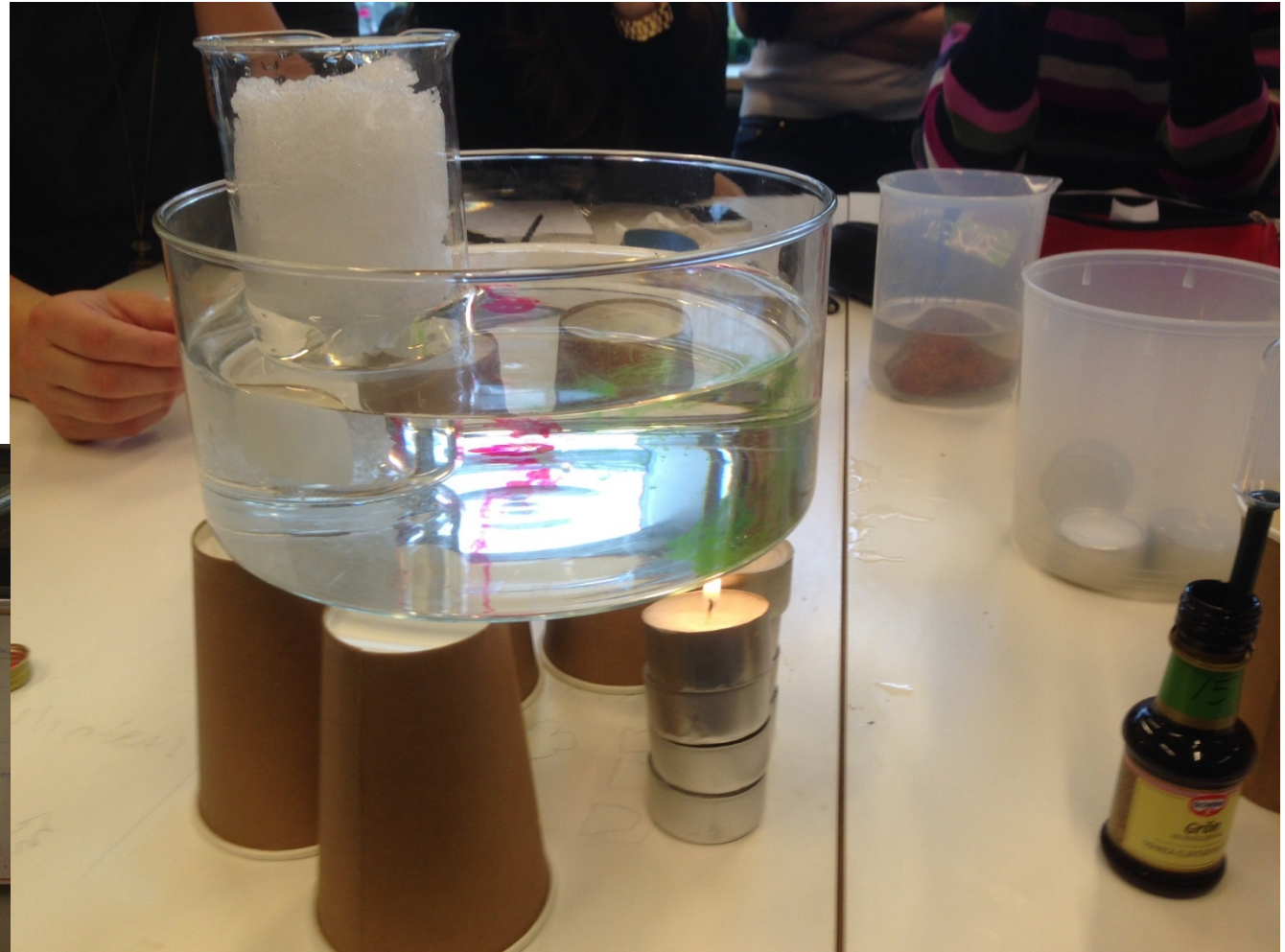
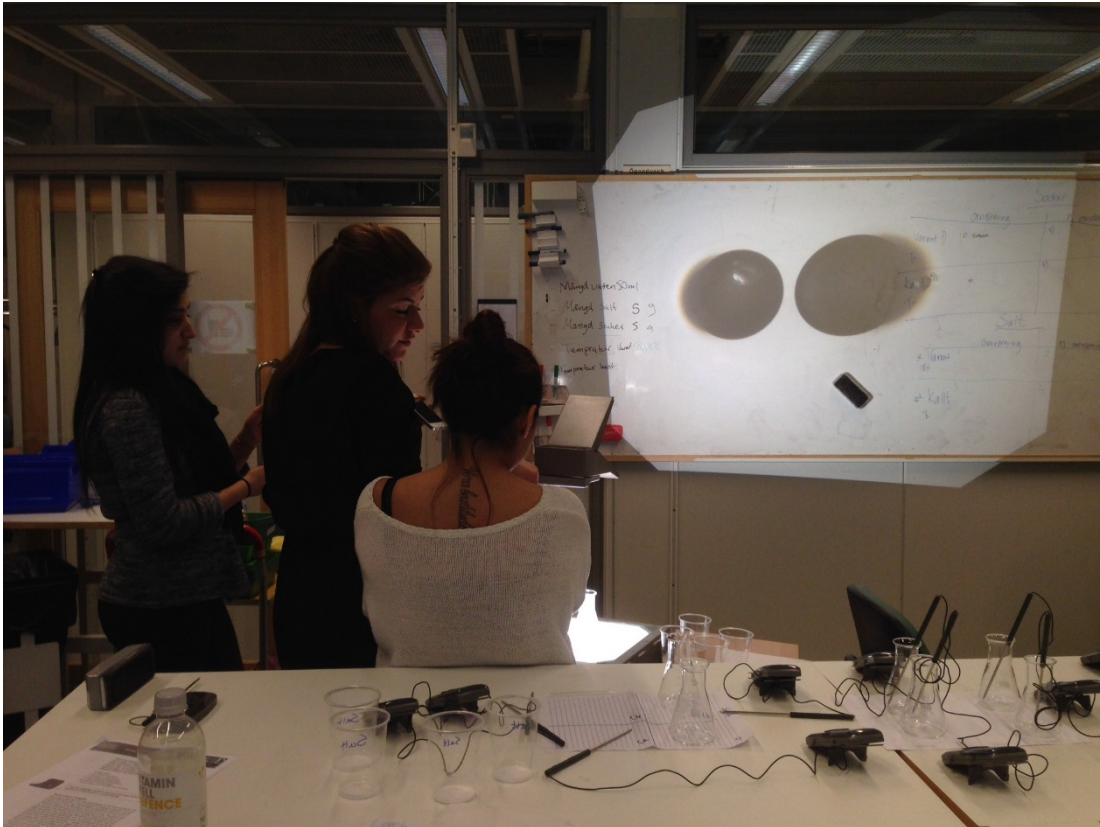
Are there misconceptions when using the terminology to explain evolutionary theories?

**Pre-service primary school teacher program for
preschool and year 1-3, second year of education.**

Course: Natural, science and technology 8 weeks:

Chemistry, Physics, Biology and Technology

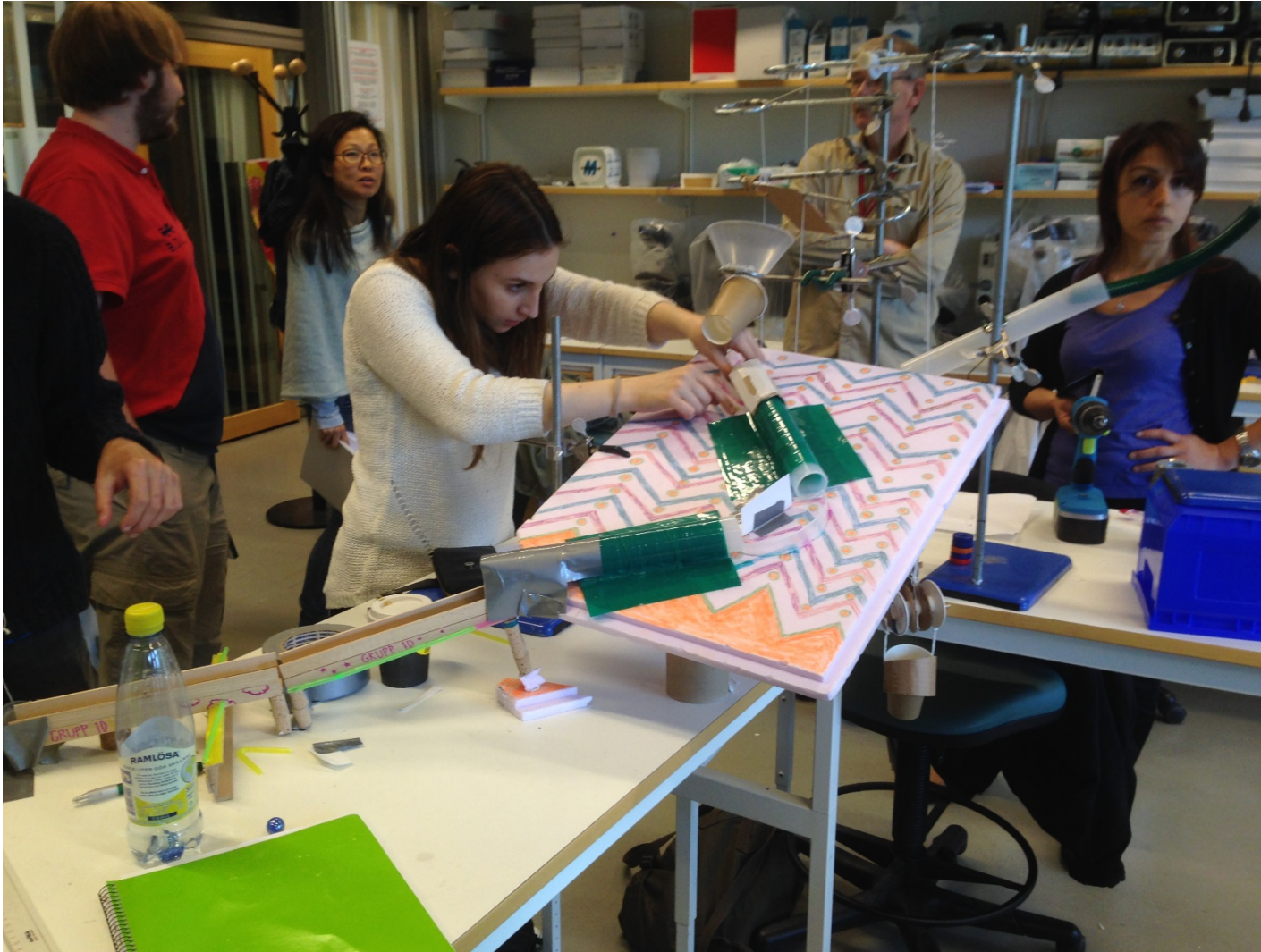
Chemistry



Aesthetic learning processes



Technology



During the first five weeks, the student wrote four short reflections about something from the course literature that could be interesting for children.



At the end of the course (after 7 weeks) the student wrote a short reflection about evolution.

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39 written reports were analyzed by scoring the numbers of concepts used.

22 different concepts were found in the short reflections about evolution.

22 evolutionary concepts used (n=39)

total used	concept
1	hereditary
2	population
2	pool
4	family
5	heredity
5	group
6	selection
10	inheritance
10	mutation
14	natural selection
14	genes
14	random
15	origin
19	variation
22	property
28	individual
32	adaptation
32	environment
39	generation
42	family
52	development
121	species

22 evolutionary concepts used (n=39)

biological concepts					
genes	14	family	4	hereditary	1
development	50	genera	42	trait	22
generation	39	species	121	origin	15
inheritance	10	mutation	10	population	2
environment	32	heredity	5	pool	2

evolutionary concepts	
adaptation	32
natural selection	14
random	14
variation	19
selection	6

The students ability to use the concepts were grouped in 4 different groups:

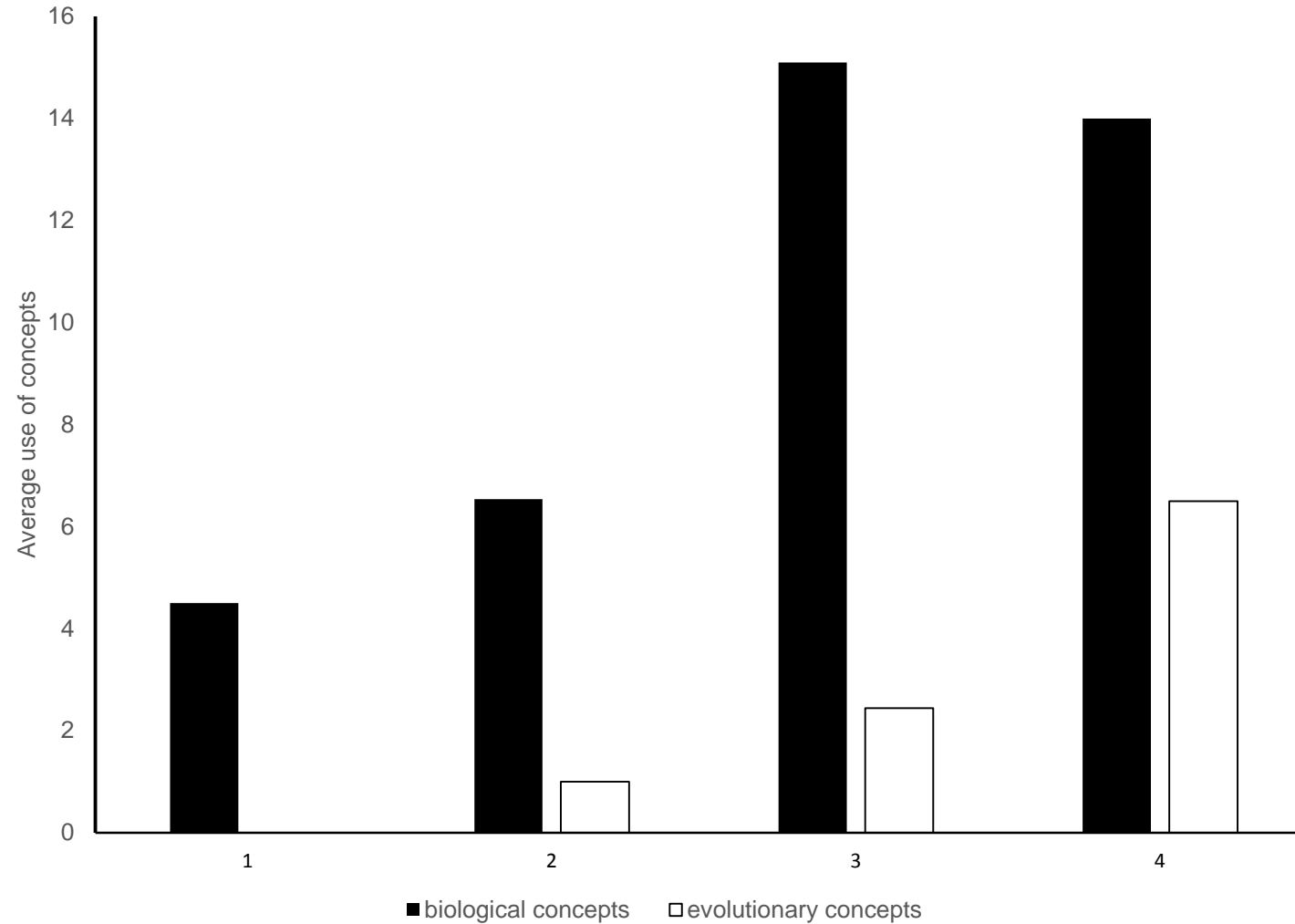
Group 1: 0 used evolutionary concept

Group 2: 1 used evolutionary concept

Group 3: 2-3 used evolutionary concepts

Group 4: 4 or more evolutionary concepts

Average concepts used in group 1, 2, 3 and 4

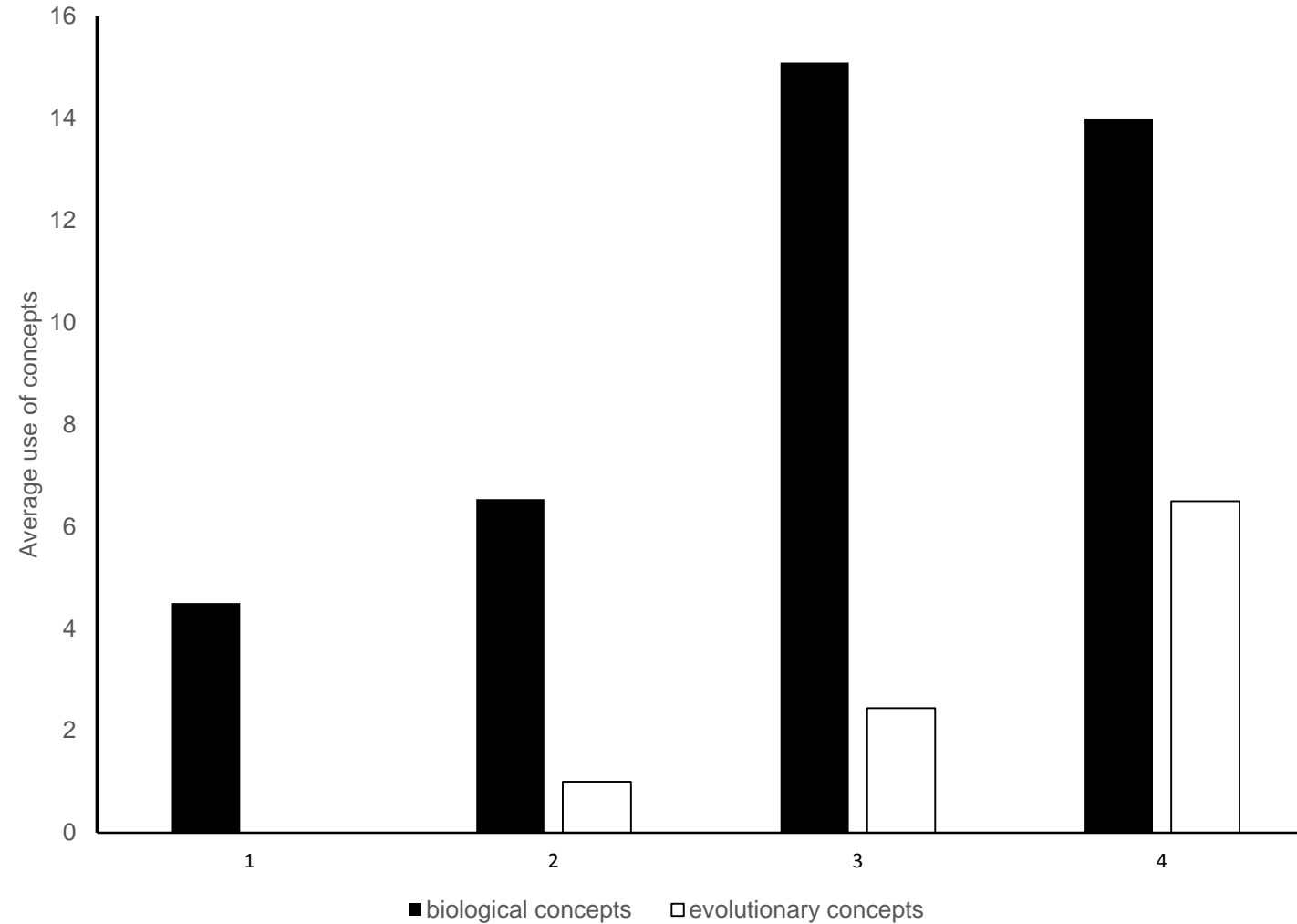


Results

22 different concepts were found in the short reflections about evolution.

There is a correlation between the use of evolutionary concepts and the use of biological concepts up to a certain level.

Average concepts used in group 1, 2, 3 and 4



22 different concepts were found in the short reflections about evolution.

There is a correlation between the use of evolutionary concepts and the use of biological concepts up to a certain level.

Some students using few concepts had a good understanding of the theory of evolution.

Conclusions:

Some but not all of the students used both biological and strict evolutionary concepts to explain evolutionary theories.

There are a limited number of students using strict evolutionary concepts.



Questions?