The state of ILOs - Report

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Contents

Abstract

This document presents a brief overview of the current state of the *Intended Learning Objectives* (hereafter *ILO*). Including information on:

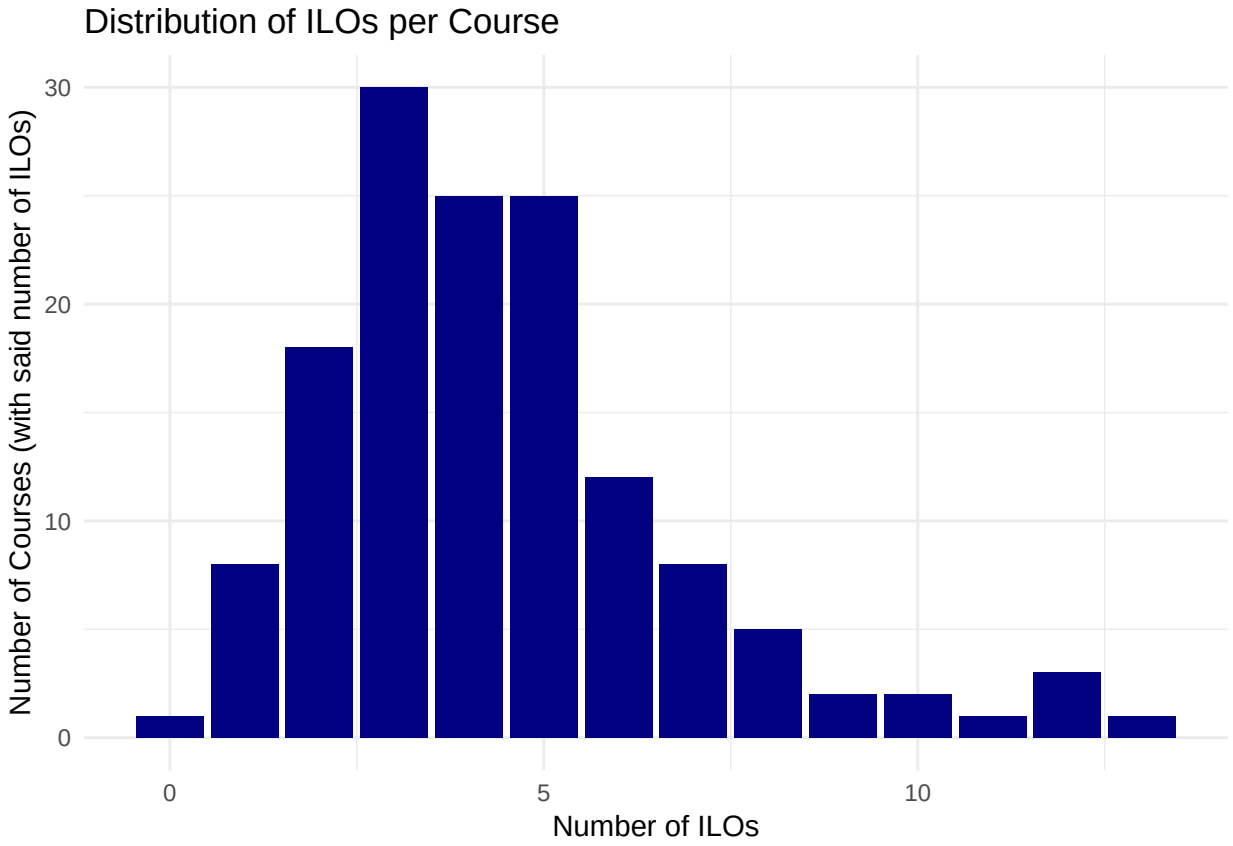
- The number of ILOs in our courses.
- The orientation of language used in ILOs
- The most common capacities the ILOs promote broken down by Level and Concentration
- [NOT DONE YET] A description of how the current objectives map to Bloom's Taxonomy of learning.
- [NOT DONE YET] Recommendations on how to write ILOs
- [NOT DONE YET] Suggested rephrasing of current ILO's

A brief overview of our data

For this analysis I used the *ILOs* for the year *2018/2019* provided by Edith. The *ILOs* of the projects (PRO) were missing from this file, and have therefore not been included in the subsequent analysis. I did have the *ILOs* for the Undergraduate Research Projects (UGR), so these are inlcuded.
The data contained a total of **141 courses**, which amounted to **625 ILOs**. All quotes from *ILOs* are referenced with base to the `ILOs_2018_2019.docx` document.

How many of ILOs do our courses have? (distribution per course)

In general, the courses had an average of 4.4 *ILOs* per course. Which were distributed as follows:



A breakdown by Level and Concentration gives:
[to be added]

With what orientation are they written? (Student vs. Course)

It was possible to distinguish two categories in the way *ILOs* were formulated. *ILOs* were either as student (S) oriented or course (C) oriented. **Student oriented** *ILOs* described what the student was supposed to achieve or have learned during the course, whilst **course oriented** *ILOs* described the aims of the course. For example:

1. Student Oriented *ILO*:

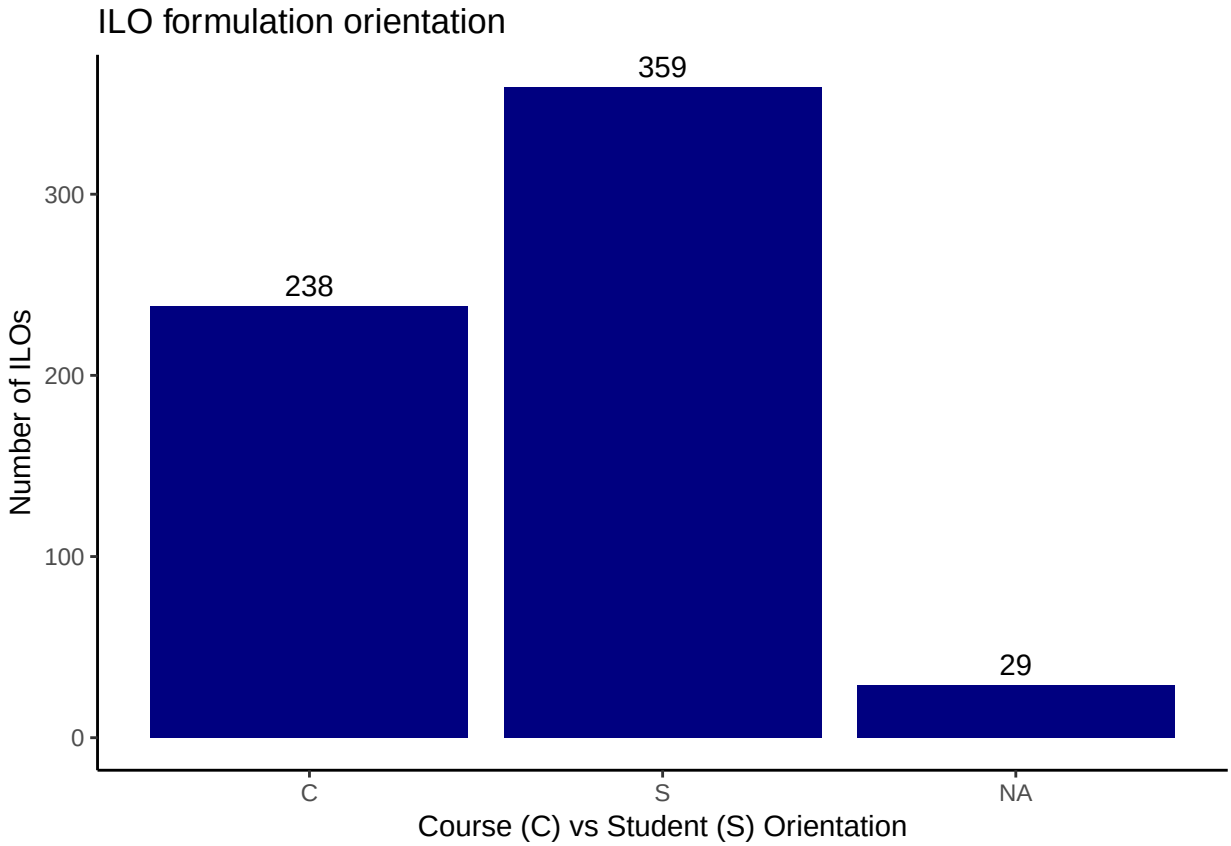
   "To offer a broad overview of scientific models" (COR1005, p. 1)
   "To acquaint students with the problems..." (HUM2030, p.3)
   "To enhance their research skills" (SKI1009, p.11)

2. Course Oriented *ILO*:

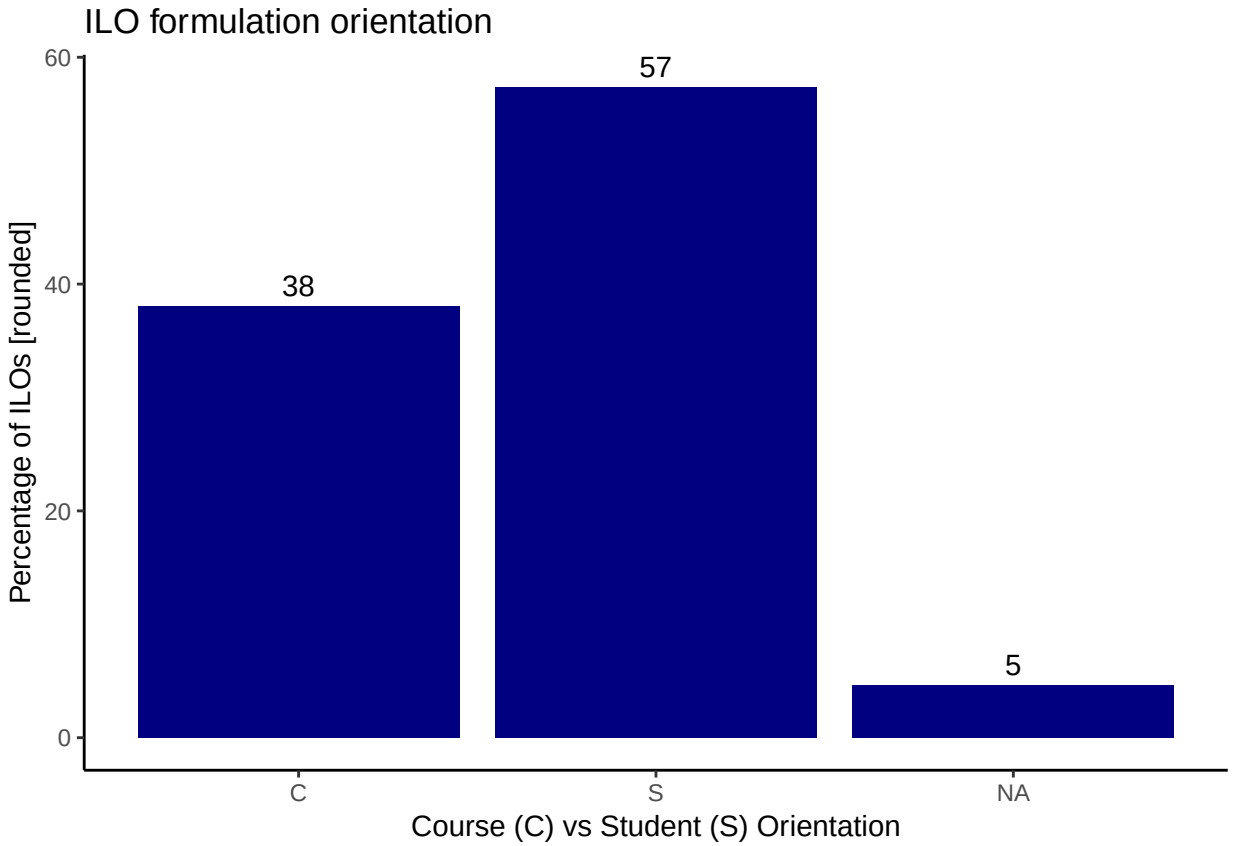
   "Apply basic bookkeeping techniques" (SSC2022, p.15)
   "To reflect on the relevance and utility of social theory in general"(SSC2028, p.15)

A few courses had some *ILOs* formulated in a student oriented fashion and others *ILOs* in a course oriented fashion. Thus, overview bellow is done at a granularity of *ILO* not courses.

In general, this is what we have in the curriculum in raw numbers:



In percentages, we have the following:



###Inspecting NA orientation category The `NA` category represents courses that I did not classify in any of those categories. They were the following *ILOs*:

Table 1: Table of ILOs wihout orientation category

Course	ILO
SCI2009	1. Human Cells and functions
SCI2009	2. Functional organization of the body
SCI2009	3. Membrane Physiology
SCI2009	4. Cardiac function and blood pressure control
SCI2009	5. Red blood cell function and gas transport and exchange
SCI2009	6. Pulmonary ventilation and regulation
SCI2009	7. Kidney function, intra-and extracellular compartments
SCI2009	8. Neuronal control
SCI2009	9. Hormonal control
SCI2009	10. Gastrointestinal Physiology
SCI2010	1. Fairness and cooperation - in the chapters on Cooperative Games and Bankruptcy Problems
SCI2010	2. Rationality and Common Knowledge - in the chapters on Extensive Form Games, Normal Form Games, Matr
SCI2010	3. Threats and Manipulations - in the part on Repeated Games
SCI2010	4. Expectations - in the chapters on Normal Form Games, Matrix Games, Repeated Games and Repeated Game
SCI2010	5. Nonmanipulability - in the chapter on Mecanism Design
SCI2031	1. Cells and humoral factors of the innate and adaptive immune system.
SCI2031	2. Cellular and molecular effector mechanisms of the innate and adaptive immunity during inflammation and inf
SCI2031	3. The structure and function of primary and secondary lymphoid tissue.
SCI2031	4. The processes in the immune response after immunisation and vaccination.
SCI2031	5. Immune mechanisms in disease.
SSC1009	All previous 5 objectives

Course	ILO
SSC2052	NA
SSC3030	1. The legal foundations of the European Union
SSC3030	2. The institutions of the EU, their historical evolution and the horizontal relationship between them
SSC3030	3. The vertical relationship between the EU and the Member States including the principles of conferral, suprem
SSC3030	4. The implementation and enforcement mechanisms of EU law infringement proceedings against Member State
SSC3057	Standard economic paradigm of expected utility theory and rational choice
SSC3057	What is the influence of neurology, psychology and sociology on the economic paradigm
SSC3057	Development of macroeconomics and policies

Analysing our ILOs

Methodology

Phase 1- Verb extraction

In order to get a better grasp of the characterization of our *ILOs*, I manually went through all *ILOs* and extracted the verb(s) describing what the student was supposed to do in each *ILO*. This created a distiction between the course verb and the student verb, as well as between the `action verb` and the `intended verb`. For instance:

1. Course verb/Student verb:
For the ILO "to provide students with [...] perspectives to examine..." (COR1004, p.1) the extracted verb is "[to] examine" not "[to] provide".

2. Action verb/Intended verb: For the ILO "to have the ability to interpret dynamical phenomena..."(SCI3006, p. 9) the verb "[to] interpret" was extracted not "[to] have (the ability)".

In cases where the verb used was missleading, descriptive words were included. For instance, in the ILO "Gain basic knowledge in using economic/statistical data and present them in an informative way" (SSC2038, p. 15), the words "Gain basic knowledge" were recorded, as opposed to simply "[to] gain". For this specific ILO, the verbs "use" and "present" were also extracted, as each ILO could have more than one verb associated to them.

During this phase I tried to keep as close as possible to the original formulation, although as I advanced through the *ILOs* I started to adapt some of the formulations to create some consistency with previously encountered data. Thus, particularily at the end formulations such as "to perform an analysis" were simply extracted as "analyse". Moreover, because of this fidelity principle, some of the verbs for ilos were not verbs at all but conveyed the expected outcome. For instance, "overview" was extracted from the following ILO: "To give an overview over the different media platforms and media practices" (HUM2022, p.3), since the student was suppoded to 'get an overview'.

This phase was performed in Excel and all extracted verbs were recorded in the same row as the original formulation, so it is possible to trace back the work and contest my check my interpretations.

In the following list, it is possible to see all the verbs that were extracted:

Table 2: Extracted verbs after Phase 1

Verbs
to know
to have knowledge
to understand
to develop attitude
to develop understanding
basic understanding

Verbs
get overview
work with models
model
acquaint
familiarize
introduce
examine
develop own analysis
[get] notion
understand
evaluate
[get] introduction
explore
test
integrate
analyse
express
[gain] familiarity
to write
[get] overview
highlight
pinpoint characteristics
explain
apply
set up
write
get acquainted
gain insight
basic introduction
explore the meaning
explore how
to study
critical reflection
learn
to trace
reflect
gain understanding
basic knowledge
select
communicate
demonstrate awareness
recognize
view films critically
[get] showned
NA
close reading
identify
develop sensitivity
distinguish
trace
to look at
construct design

Verbs
address the what, who, why, how, when, where
study
present
grasp
critically analyse
contribute to debates
develop own understaning
describe
take position in debate
gain sufficient background
be presented with
appreciate (more)
acquire basic toolbox
reason qualitatively
be prepared
notice
elaborate
give examples
point out
design
use
improve problem solving skills
solve
develop computational skills
know
gain basic practical knowledge
obtain basic knowledge
review
cast
make use
interpret
presentation skills
meet
collect
demonstrate
translate
establish (link)
enrich discussion
propose (solutions)
work
formulate
produce
interview
execute
conduct
practice
enhance research skills
experience
brain storm
deliver
integrate (visual aids)
give feedback

Verbs
carve out (underlying structure)
build argument
plan
make coherent
gain expertise
perform
report
find
prepare
position interest
work together
transcribe
be engaged (in scientific inquiry)
gain funcionalist vision
judge
comprehend
differentiate
coduct
make contact
discover
read
construct
engage in socio-legal thinking
be conversant
survey
develop
see
consider
retreive
list
provide (reasons)
form reasoned opinions
become aware
research
discuss
develop (an approach to)
retain
investigate
reflect (critically)
(conduct) research
cope
work in groups
keep infromed
frame
approach
view
assess
appreciate
value
gain perspective
deal with
discern

Verbs
peer reviewing skills
to be able to see
use general models and modelling techiques
compare
connect
get an idea of
situate in context
debate
to explain
use specialized terms
reconstruct
(apply)adopt method
execute design
contextualize
think practically
talk
reason analyticaly
compose
debug
define
reason academically
inspire
pitch
organise
adapt
avoid
modify
gather
turn into
set up plan
observing
create
understand (critically)
manage
unlock (ongoing debates)
speak (“orally”)
illustrate
weigh
retain content
extract
give (opinion)
display (tolerance)
use frameworks
incorporate feedback
to put trends in context
synthesise and explain
to discuss
apply criticism
run programs
answer
outline
interact

Verbs
speak
choose
taking fieldnotes & interviewing
reduce (stereotypes)
write/plead
define/analyse/answer
criticize
to further (research, analyical and writing skills)
reinforce (opinion)
use knowledge

Phase 2- Standardisation

As you can see, some verbs are really similar. For example, we have: "to understand", "understand" and "basic understanding". Therefore, in `Phase 2` I standardised some of the vocabulary. All of the previous words were replaced by the same words: "understand". Here is an overview of the replacements:

```
## [1] "The verbs that were taken to be the same as \"understand\" are: to understand, to develop unders
## [1] "The verbs that were taken to be the same as \"know\" are: to know, to have knowledge, basic knou
## [1] "The verbs that were taken to be the same as \"[gain] familiarity\" are: familiarize, [gain] fami
## [1] "The verbs that were taken to be the same as \"analyse\" are: develop own analysis, analyse, cri
## [1] "The verbs that were taken to be the same as \"[be] introduced\" are: introduce, [get] introducti
## [1] "The verbs that were taken to be the same as \"[get] overview\" are: get overview, [get] overvie
## [1] "The verbs that were taken to be the same as \"[get] acquainted\" are: acquaint, get acquainted"
```

The result is a table like this:

Course	ILO
COR1002	To have knowledge of a number of specific problems in the foundations of the social sciences, such as explanati
COR1002	To have knowledge of the major problems or topics in the philosophy of science, such as the demarcation betwe
COR1002	To know the major approaches in the philosophy of science, such as the traditional or received view, Karl Popp
COR1003	To Develop a critical understanding concerning the relation between perspective bias, facts, and context, as wel
COR1003	To develop a critical attitude towards the interpretation of historical data and processes
COR1003	To understand the main trends in politics, demography, society and culture since 1945, and will be able to see a
COR1003	To understand the main trends in politics, demography, society and culture since 1945, and will be able to see a
COR1003	To understand the main trends in politics, demography, society and culture since 1945, and will be able to see a
COR1004	To provide the students with a basic understanding of what political philosophy is about and why it is importa
COR1004	To understand the central concepts like justice and equality in theory, and in application.
COR1005	To offer a broad overview of scientific models and modelling techniques in different disciplines
COR1005	To teach students how to model a specific phenomenon by using general models and modelling techniques
COR1005	To teach students how to model a specific phenomenon by using general models and modelling techniques

Results

Rough numeric overview:

After the previous methodology has been applied, we have 771 individual capacity learning objectives (hereafter capacities). These are the abilities we intend to promote in our students according to our learning

objectives and correspond to individual "verbs" (e.g. "understand", "analyse"). The breakdown by level is as follows:

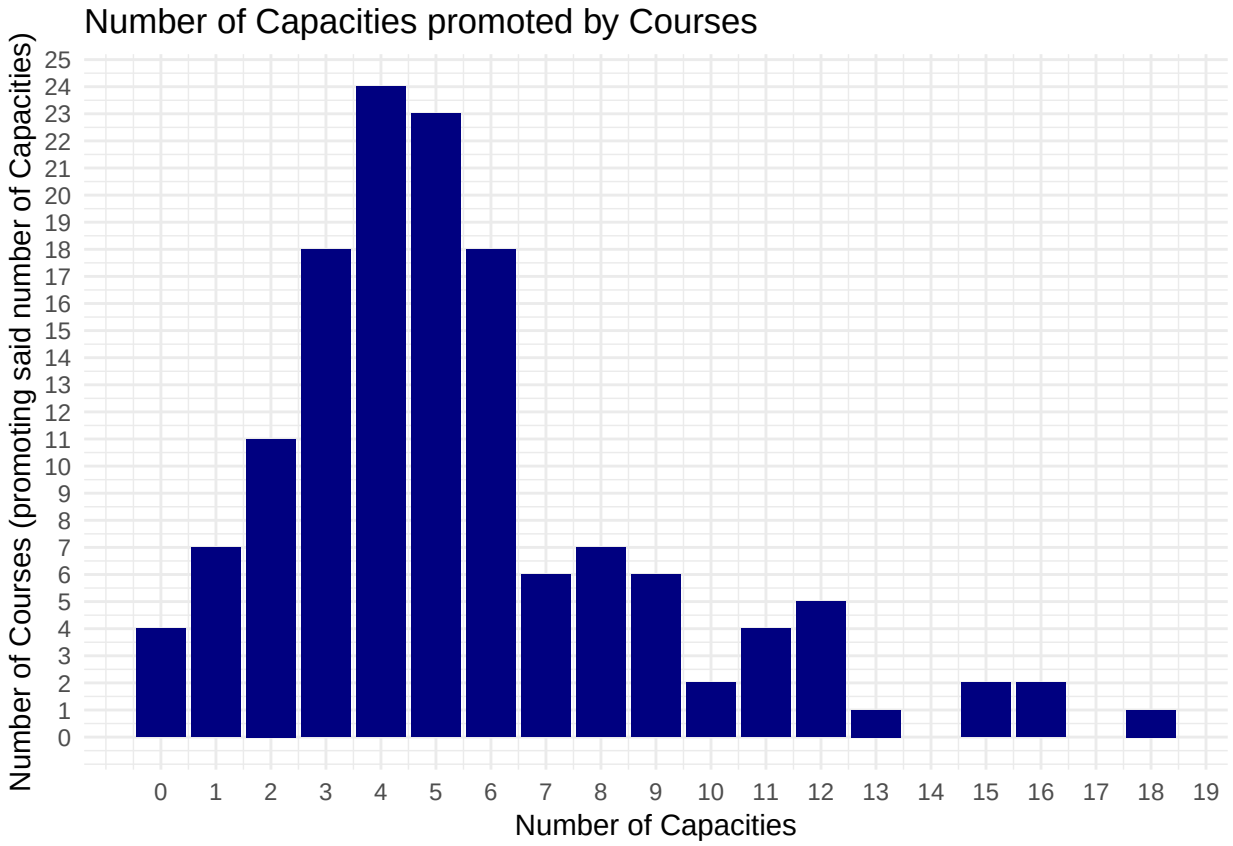
Level 1000: 123 capacities

Level 2000: 387 capacities.

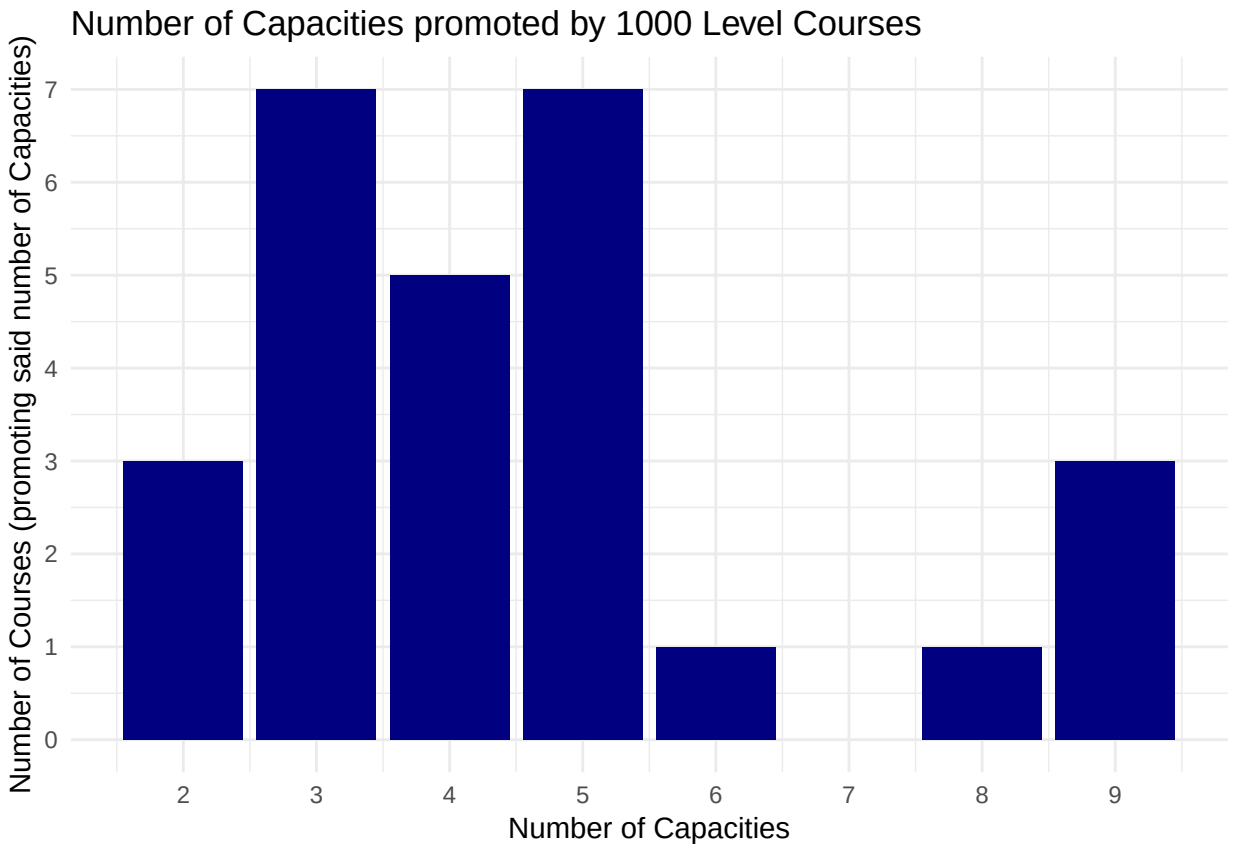
Level 3000: 123 capacities.

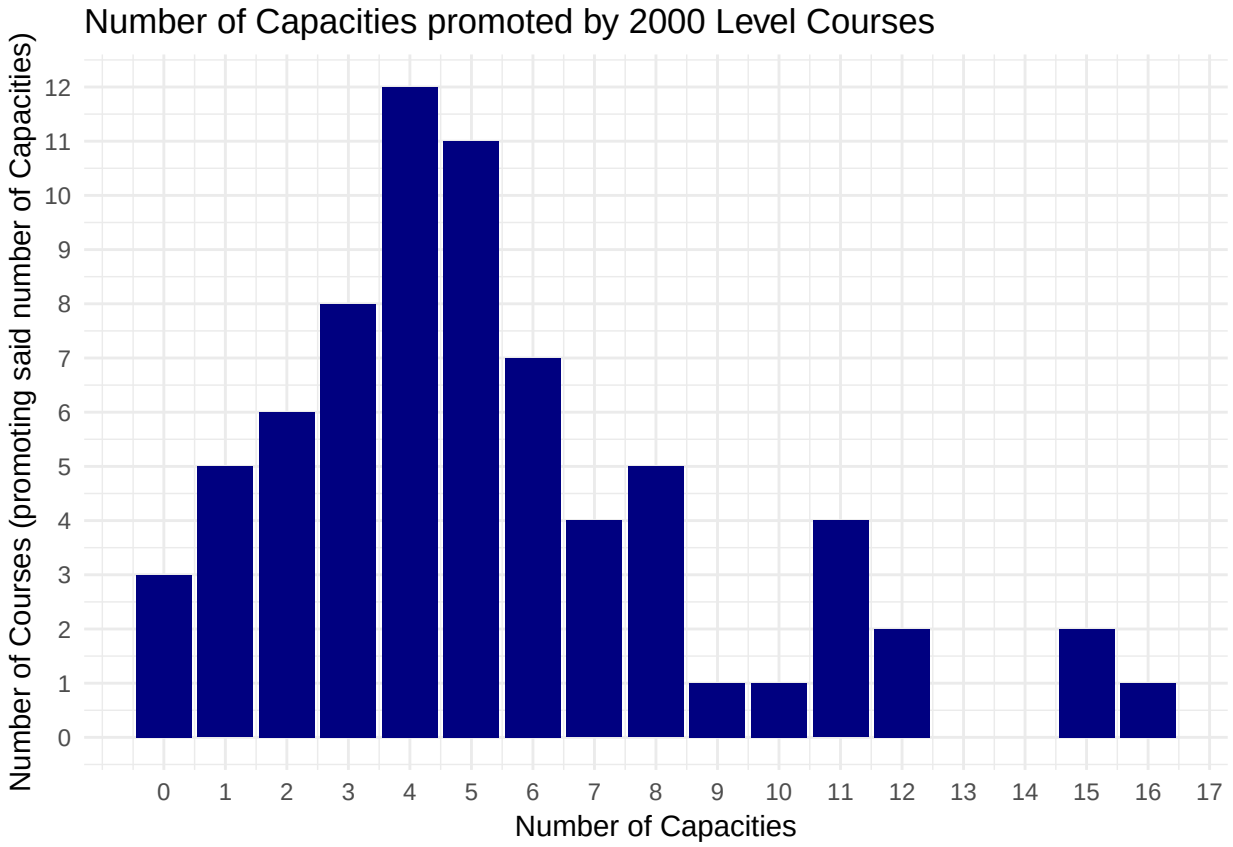
Graphically:

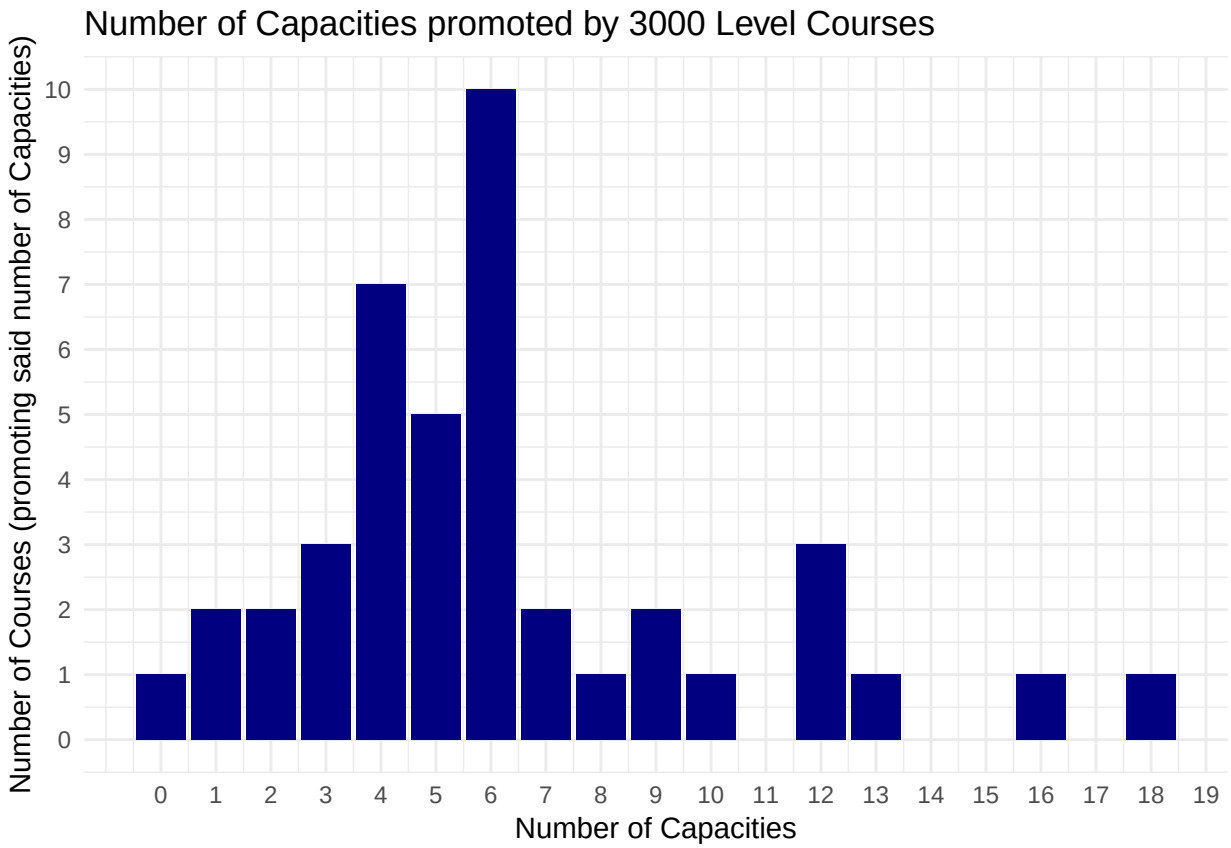
Across all courses:



By Level:


Number of Capacities promoted by 1000 Level Courses
Number of Courses (promoting said number of Capacities)
0
1
2
3
4
5
6
7
2
3
4
5
6
7
8
9
Number of Capacities

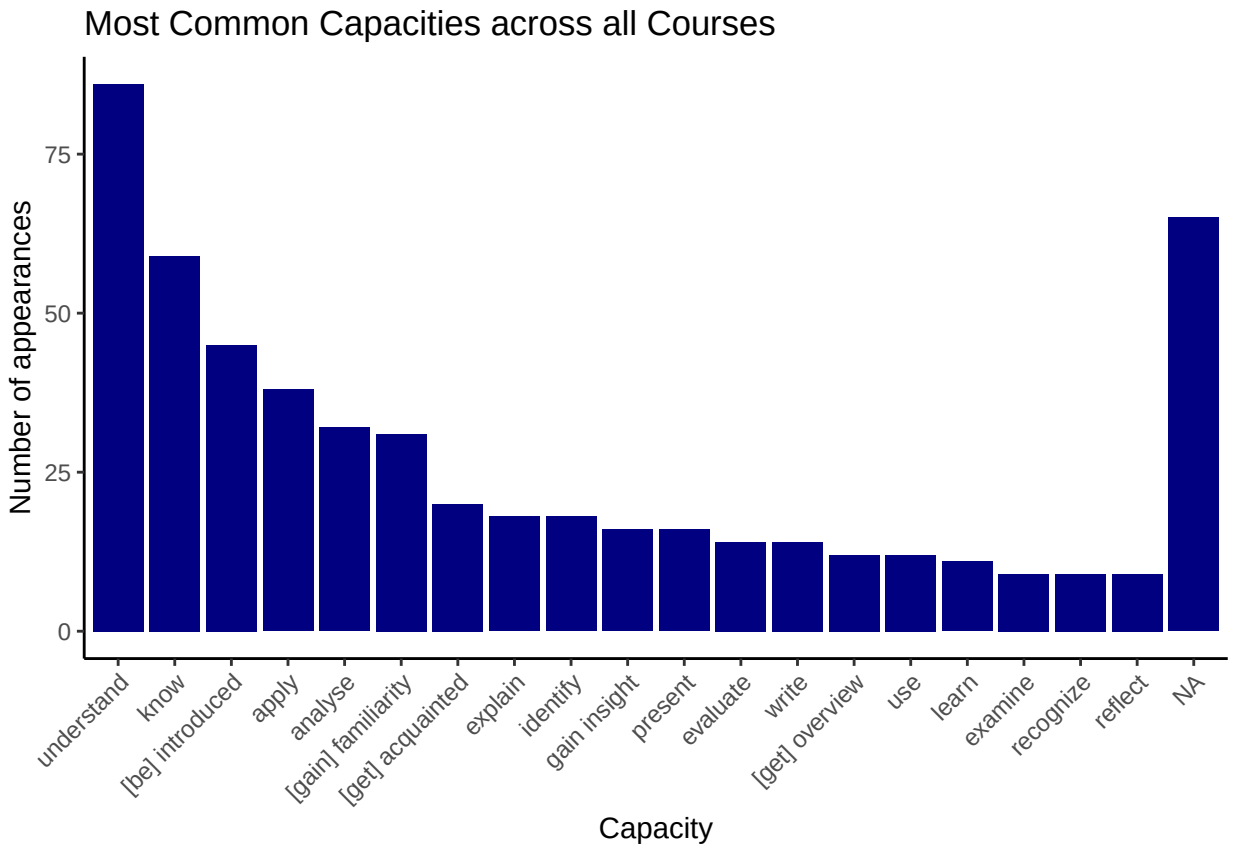

Number of Capacities promoted by 2000 Level Courses
Number of Courses (promoting said number of Capacities)
0
1
2
3
4
5
6
7
8
9
10
11
12
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
Number of Capacities



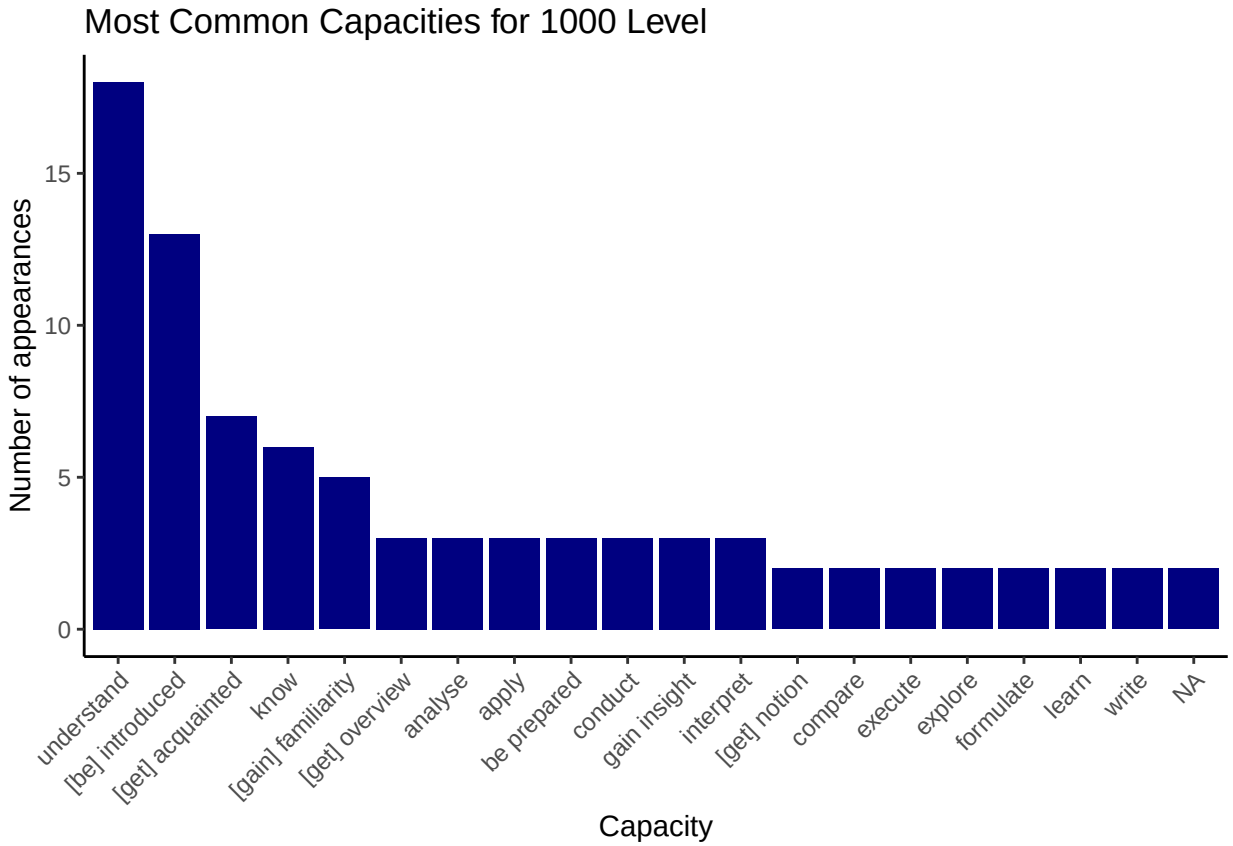
Capacities inspection

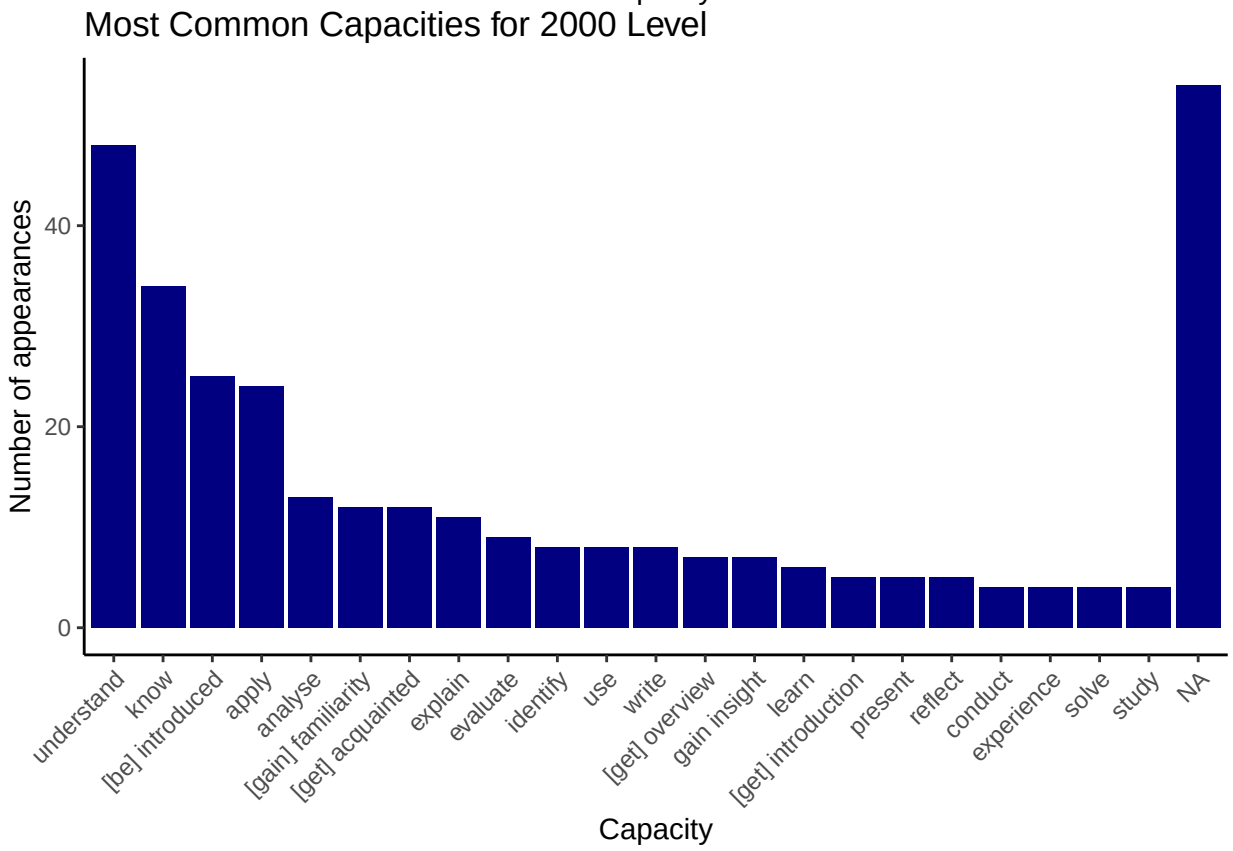
So what are these capacities?

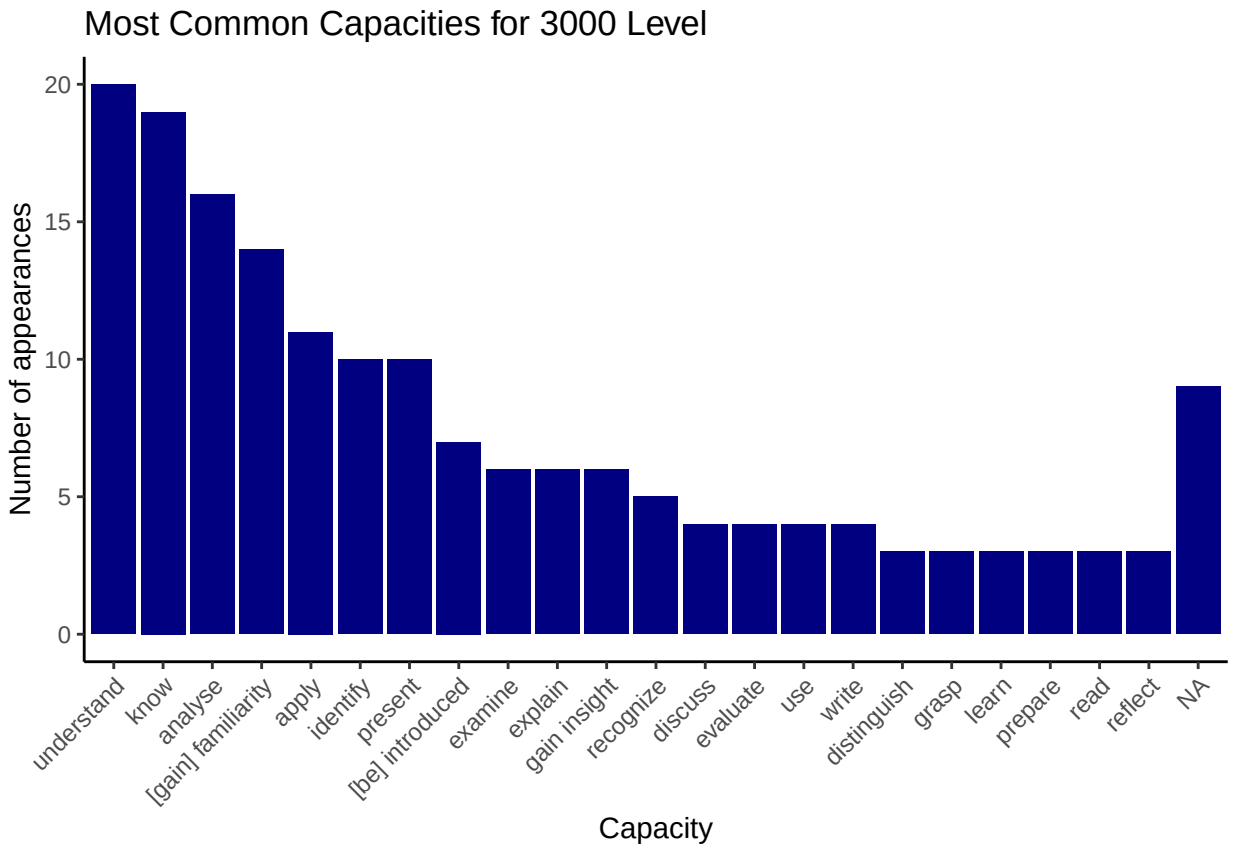
Across all courses



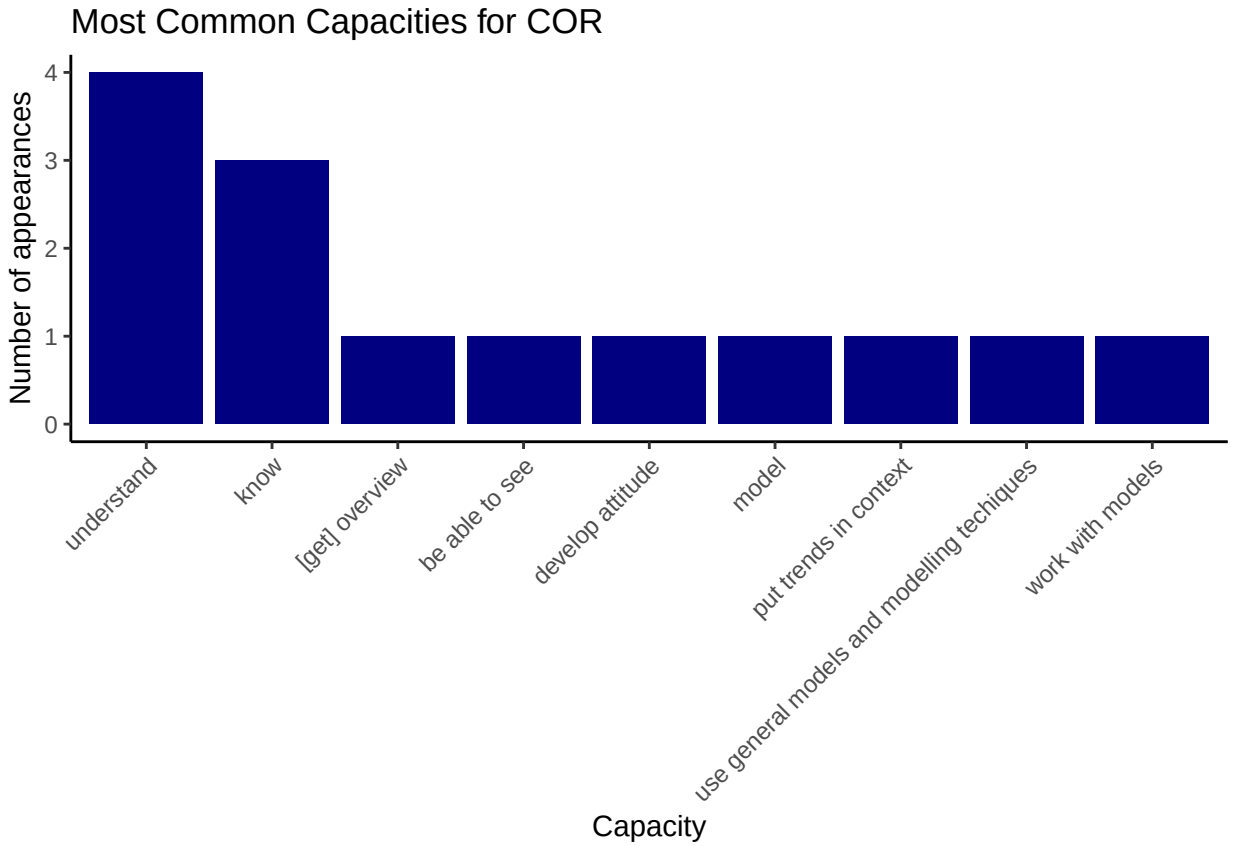
Breakdown by Level

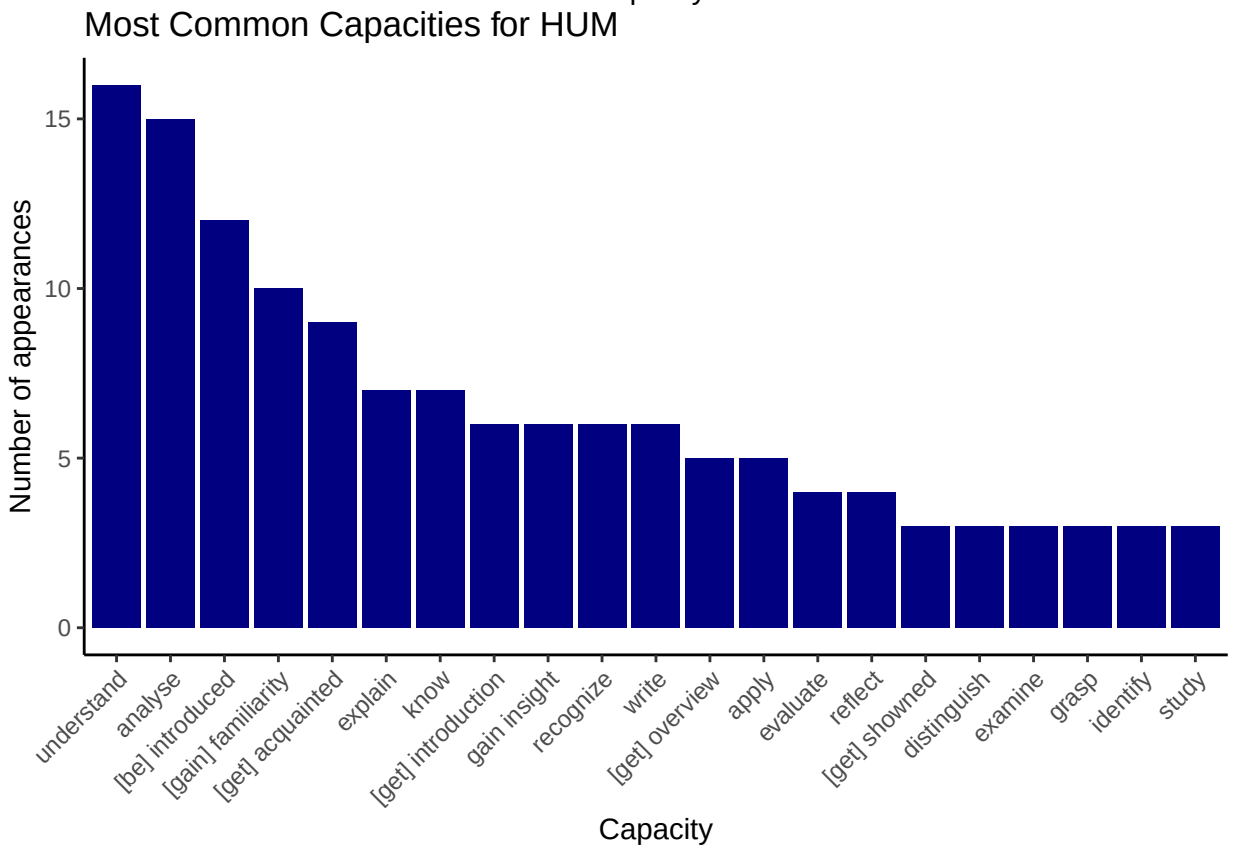

Most Common Capacities for 1000 Level
Number of appearances
0
5
10
15
understand
[be] introduced
[get] acquainted
know
[gain] familiarity
[get] overview
analyse
apply
be prepared
conduct
gain insight
interpret
[get] notion
compare
execute
explore
formulate
learn
write
NA
Capacity

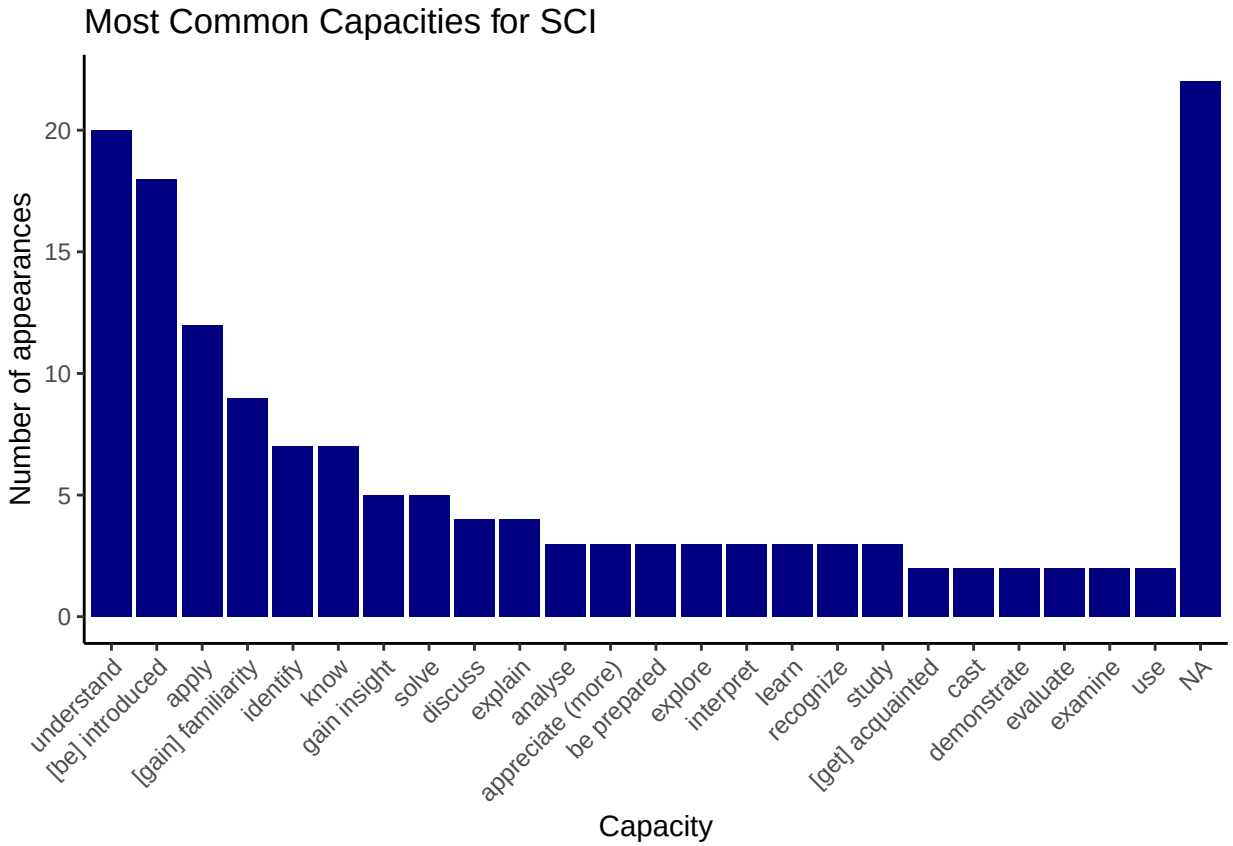

Most Common Capacities for 2000 Level
Number of appearances
0
20
40
understand
know
[be] introduced
apply
analyse
[gain] familiarity
[get] acquainted
explain
evaluate
identify
use
write
[get] overview
gain insight
learn
[get] introduction
present
reflect
conduct
experience
solve
study
NA
Capacity

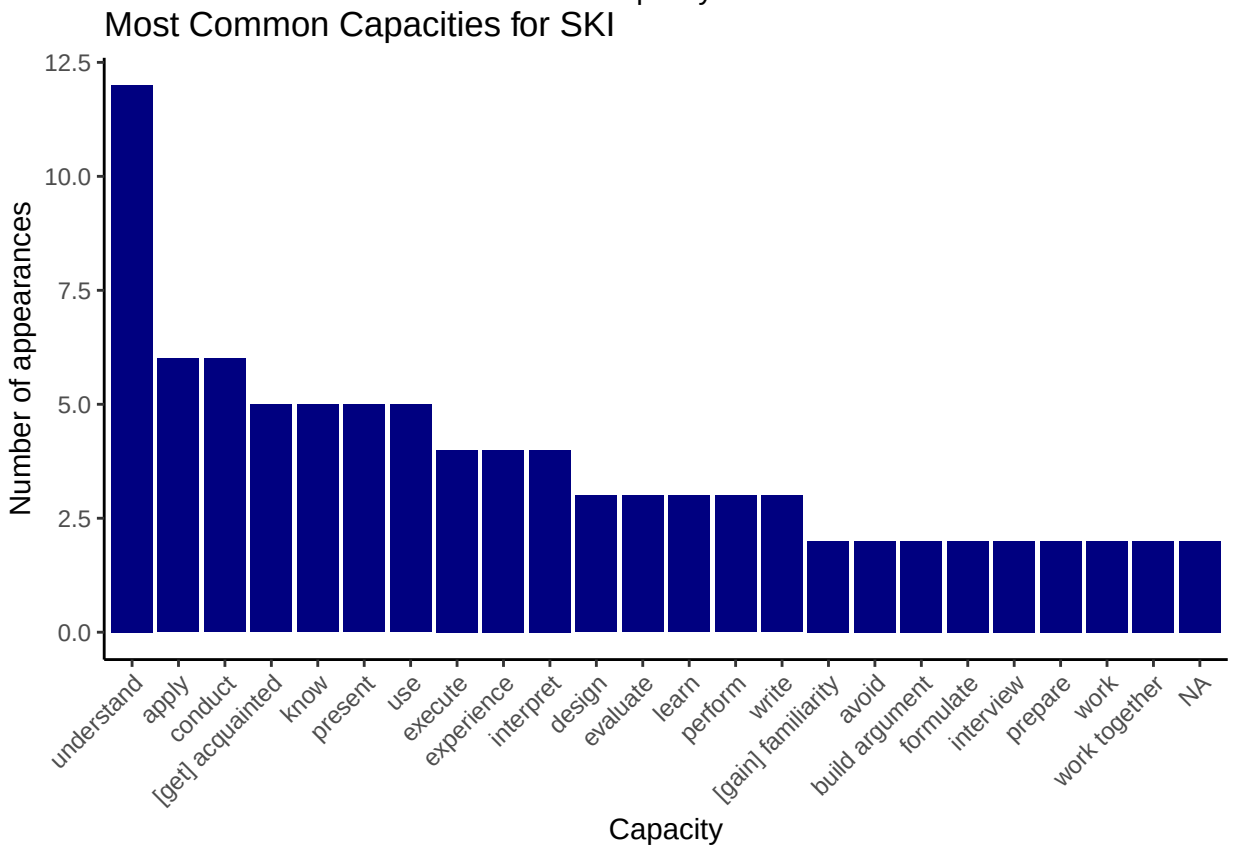


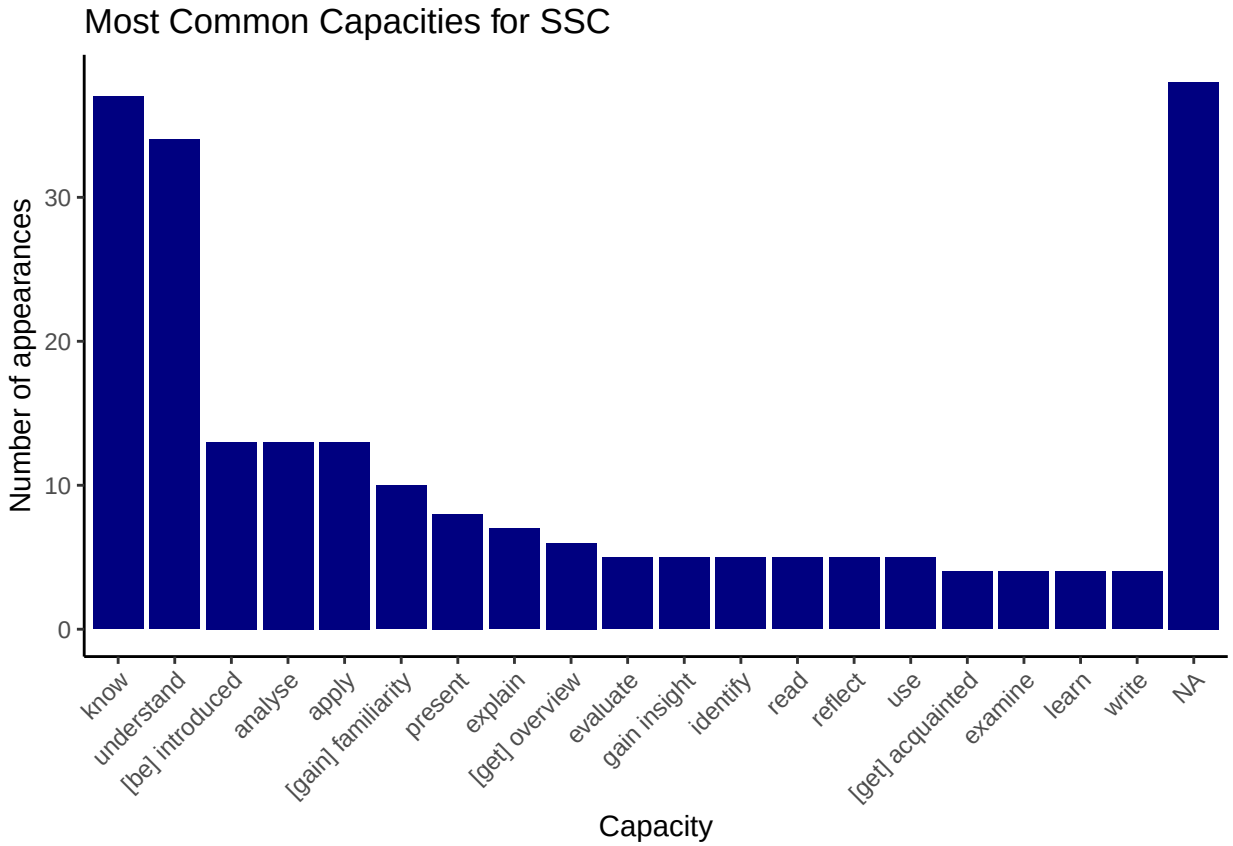
Breakdown by Concentration

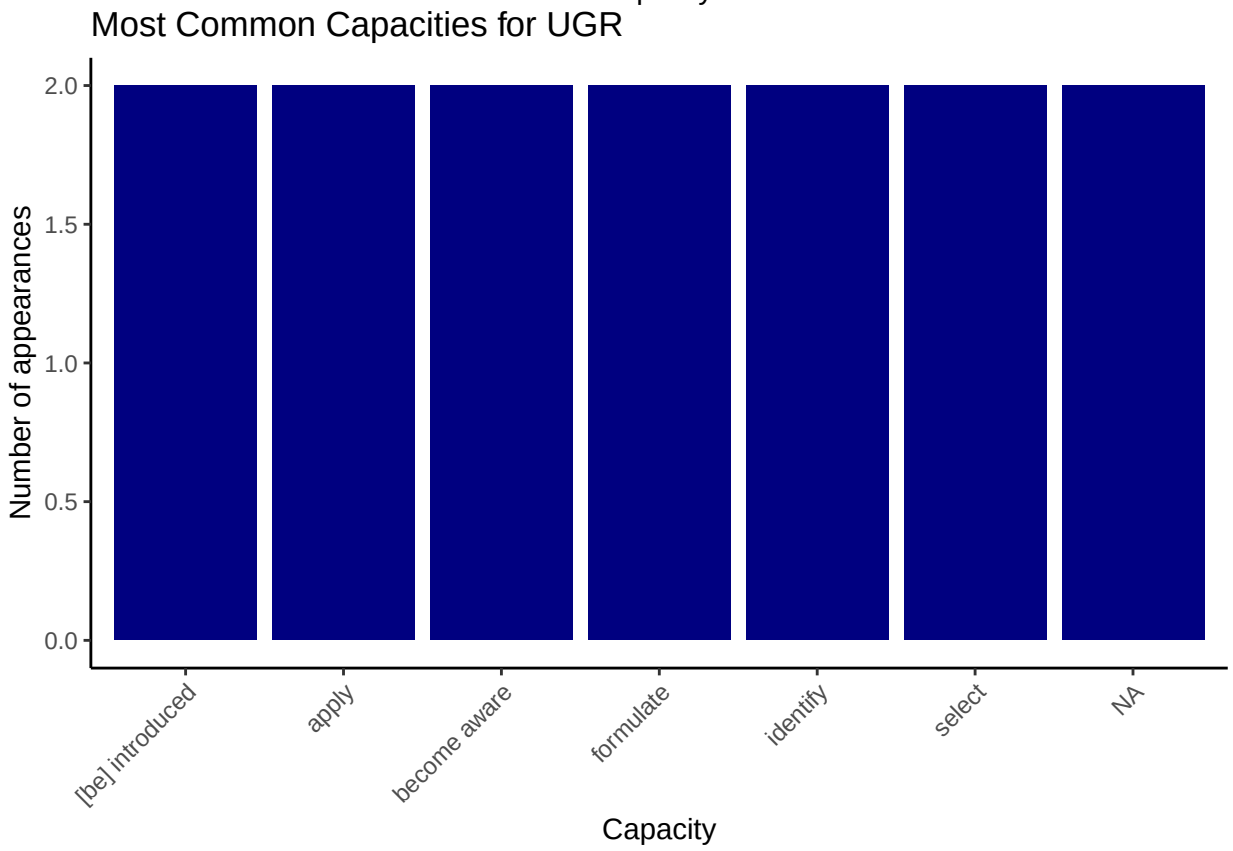

Most Common Capacities for COR
Number of appearances
0
1
2
3
4
understand
know
[get] overview
be able to see
develop attitude
model
put trends in context
use general models and modelling techiques
work with models
Capacity


Most Common Capacities for HUM
Number of appearances
0
5
10
15
understand
analyse
[be] introduced
[gain] familiarity
[get] acquainted
explain
know
[get] introduction
gain insight
recognize
write
[get] overview
apply
evaluate
reflect
[get] showned
distinguish
examine
grasp
identify
study
Capacity


Most Common Capacities for SCI
Number of appearances
0
5
10
15
20
understand
[be] introduced
apply
[gain] familiarity
identify
know
gain insight
solve
discuss
explain
analyse
appreciate (more)
be prepared
explore
interpret
learn
recognize
study
[get] acquainted
cast
demonstrate
evaluate
examine
use
NA
Capacity


Most Common Capacities for SKI
Number of appearances
0.0
2.5
5.0
7.5
10.0
12.5
understand
apply
conduct
[get] acquainted
know
present
use
execute
experience
interpret
design
evaluate
learn
perform
write
[gain] familiarity
avoid
build argument
formulate
interview
prepare
work
work together
NA
Capacity


Most Common Capacities for SSC
Number of appearances
0
10
20
30
know
understand
[be] introduced
analyse
apply
[gain] familiarity
present
explain
[get] overview
evaluate
gain insight
identify
read
reflect
use
[get] acquainted
examine
learn
write
NA
Capacity


Most Common Capacities for UGR
Number of appearances
0.0
0.5
1.0
1.5
2.0
[be] introduced
apply
become aware
formulate
identify
select
NA
Capacity