ILO summary- Week 1 Report

Sofia Vazquez Alferez (DARS, University College Maastricht

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```
## Warning in strptime(x, format, tz = tz): unknown timezone 'zone/tz/2019a.
## 1.0/zoneinfo/Europe/Amsterdam'
```

```
## Warning: package 'bindrcpp' was built under R version 3.4.4
```

Abstract

This document presents a brief overview of the current state of the *Intended Learning Objectives* (hereafter *ILO*). Included is information on:
1. The orientation of language used in ILOs
2. The most common objectives broken down by Level and Concentration
3. A description of how the objectives map to Bloom's Taxonomy of learning
4. Recommendations

Introduction *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.

Distribution of ILO per course

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

Distribution of ILOs per Course

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

Orientation of Language

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)
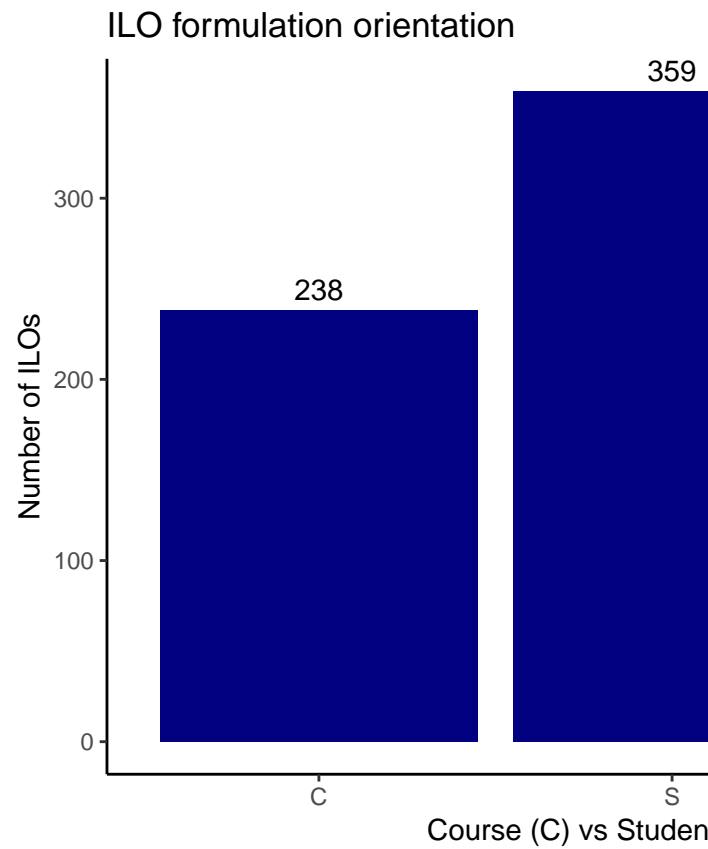"To acquaint students with the problems. . . " (HUM2030, p.3)
"To enhance their research skills" (SKI1009, p.11)
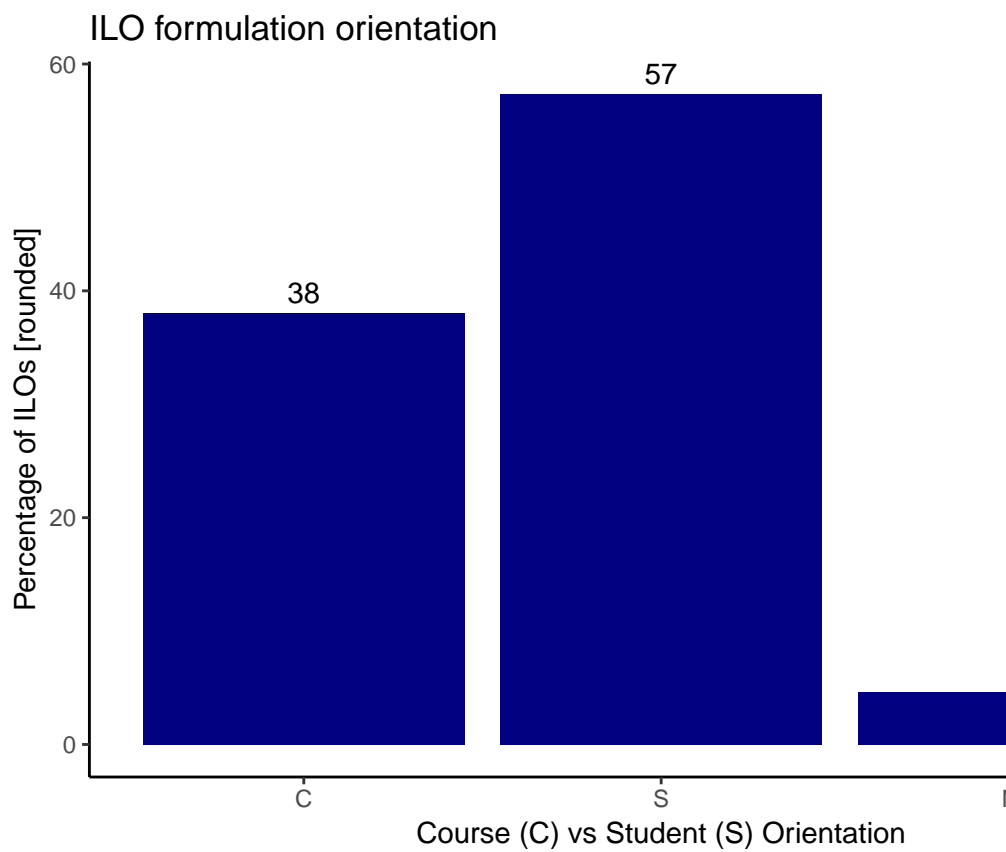
   2. Course Oriented *ILO*:
     > "Apply basic bookkeeping techniques" (SSC2022, p.15)
     "To reflect on the relevance and utility of social theory in general"(SSC2028, p.15)

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.

ILO formulation orientation

359

300

200

238

Number of ILOs

100

0

C   S

Course (C) vs Studen

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

ILO formulation orientation

60

57

40

38

Percentage of ILOs [rounded]

20

0

C   S

Course (C) vs Student (S) Orientation

In percentages, we have the following::

3

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
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

So, what types of *ILOs* do we have?

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 supposed 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:

```
##    [1] "to know"
##    [2] "to have knowledge"
##    [3] "to understand"
##    [4] "to develop attitude"
##    [5] "to develop understanding"
##    [6] "basic understanding"
##    [7] "get overview"
##    [8] "work with models"
##    [9] "model"
##   [10] "acquaint"
##   [11] "familiarize"
##   [12] "introduce"
##   [13] "examine"
##   [14] "develop own analysis"
##   [15] "[get] notion"
##   [16] "understand"
##   [17] "evaluate"
##   [18] "[get] introduction"
##   [19] "explore"
##   [20] "test"
##   [21] "integrate"
##   [22] "analyse"
##   [23] "express"
##   [24] "[gain] familiarity"
##   [25] "to write"
##   [26] "[get] overview"
##   [27] "highlight"
##   [28] "pinpoint characteristics"
##   [29] "explain"
##   [30] "apply"
##   [31] "set up"
##   [32] "write"
##   [33] "get acquainted"
##   [34] "gain insight"
##   [35] "basic introduction"
##   [36] "explore the meaning"
##   [37] "explore how"
##   [38] "to study"
```

```
##  [39] "critical reflection"
##  [40] "learn"
##  [41] "to trace"
##  [42] "reflect"
##  [43] "gain understanding"
##  [44] "basic knowledge"
##  [45] "select"
##  [46] "communicate"
##  [47] "demonstrate awareness"
##  [48] "recognize"
##  [49] "view films critically"
##  [50] "[get] showned"
##  [51] NA
##  [52] "close reading"
##  [53] "identify"
##  [54] "develop sensitivity"
##  [55] "distinguish"
##  [56] "trace"
##  [57] "to look at"
##  [58] "construct design"
##  [59] "address the what, who, why, how, when, where"
##  [60] "study"
##  [61] "present"
##  [62] "grasp"
##  [63] "critically analyse"
##  [64] "contribute to debates"
##  [65] "develop own understaning"
##  [66] "describe"
##  [67] "take position in debate"
##  [68] "gain sufficient background"
##  [69] "be presented with"
##  [70] "appreciate (more)"
##  [71] "acquire basic toolbox"
##  [72] "reason qualitatively"
##  [73] "be prepared"
##  [74] "notice"
##  [75] "elaborate"
##  [76] "give examples"
##  [77] "point out"
##  [78] "design"
##  [79] "use"
##  [80] "improve problem solving skills"
##  [81] "solve"
##  [82] "develop computational skills"
##  [83] "know"
##  [84] "gain basic practical knowledge"
##  [85] "obtain basic knowledge"
##  [86] "review"
##  [87] "cast"
##  [88] "make use"
##  [89] "interpret"
##  [90] "presentation skills"
##  [91] "meet"
##  [92] "collect"
```

```
##  [93] "demonstrate"
##  [94] "translate"
##  [95] "establish (link)"
##  [96] "enrich discussion"
##  [97] "propose (solutions)"
##  [98] "work"
##  [99] "formulate"
## [100] "produce"
## [101] "interview"
## [102] "execute"
## [103] "conduct"
## [104] "practice"
## [105] "enhance research skills"
## [106] "experience"
## [107] "brain storm"
## [108] "deliver"
## [109] "integrate (visual aids)"
## [110] "give feedback"
## [111] "carve out (underlying structure)"
## [112] "build argument"
## [113] "plan"
## [114] "make coherent"
## [115] "gain expertise"
## [116] "perform"
## [117] "report"
## [118] "find"
## [119] "prepare"
## [120] "position interest"
## [121] "work together"
## [122] "transcribe"
## [123] "be engaged (in scientific inquiry)"
## [124] "gain funcionalist vision"
## [125] "judge"
## [126] "comprehend"
## [127] "differentiate"
## [128] "coduct"
## [129] "make contact"
## [130] "discover"
## [131] "read"
## [132] "construct"
## [133] "engage in socio-legal thinking"
## [134] "be conversant"
## [135] "survey"
## [136] "develop"
## [137] "see"
## [138] "consider"
## [139] "retreive"
## [140] "list"
## [141] "provide (reasons)"
## [142] "form reasoned opinions"
## [143] "become aware"
## [144] "research"
## [145] "discuss"
## [146] "develop (an approach to)"
```

```
## [147] "retain"
## [148] "investigate"
## [149] "reflect (critically)"
## [150] "(conduct) research"
## [151] "cope"
## [152] "work in groups"
## [153] "keep infromed"
## [154] "frame"
## [155] "approach"
## [156] "view"
## [157] "assess"
## [158] "appreciate"
## [159] "value"
## [160] "gain perspective"
## [161] "deal with"
## [162] "discern"
## [163] "peer reviewing skills"
## [164] "to be able to see"
## [165] "use general models and modelling techiques"
## [166] "compare"
## [167] "connect"
## [168] "get an idea of"
## [169] "situate in context"
## [170] "debate"
## [171] "to explain"
## [172] "use specialized terms"
## [173] "reconstruct"
## [174] "(apply)adopt method"
## [175] "execute design"
## [176] "contextualize"
## [177] "think practically"
## [178] "talk"
## [179] "reason analyticaly"
## [180] "compose"
## [181] "debug"
## [182] "define"
## [183] "reason academically"
## [184] "inspire"
## [185] "pitch"
## [186] "organise"
## [187] "adapt"
## [188] "avoid"
## [189] "modify"
## [190] "gather"
## [191] "turn into"
## [192] "set up plan"
## [193] "observing"
## [194] "create"
## [195] "understand (critically)"
## [196] "manage"
## [197] "unlock (ongoing debates)"
## [198] "speak (\"orally\")"
## [199] "illustrate"
## [200] "weigh"
```

```
## [201] "retain content"
## [202] "extract"
## [203] "give (opinion)"
## [204] "display (tolerance)"
## [205] "use frameworks"
## [206] "incorporate feedback"
## [207] "to put trends in context"
## [208] "synthesise and explain"
## [209] "to discuss"
## [210] "apply criticism"
## [211] "run programs"
## [212] "answer"
## [213] "outline"
## [214] "interact"
## [215] "speak"
## [216] "choose"
## [217] "taking fieldnotes & interviewing"
## [218] "reduce (stereotypes)"
## [219] "write/plead"
## [220] "define/analyse/answer"
## [221] "criticize"
## [222] "to further (research, analyical and writing skills)"
## [223] "reinforce (opinion)"
## [224] "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 know
```

```
## [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, crit
```

```
## [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 explanatio
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

| Course	ILO
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

FROM HERE ON IT IS NOT CLEAN!!!!

Time for some summary graphs and summary statistics: ###Summary Statistics ####Total verbs in ILOs:
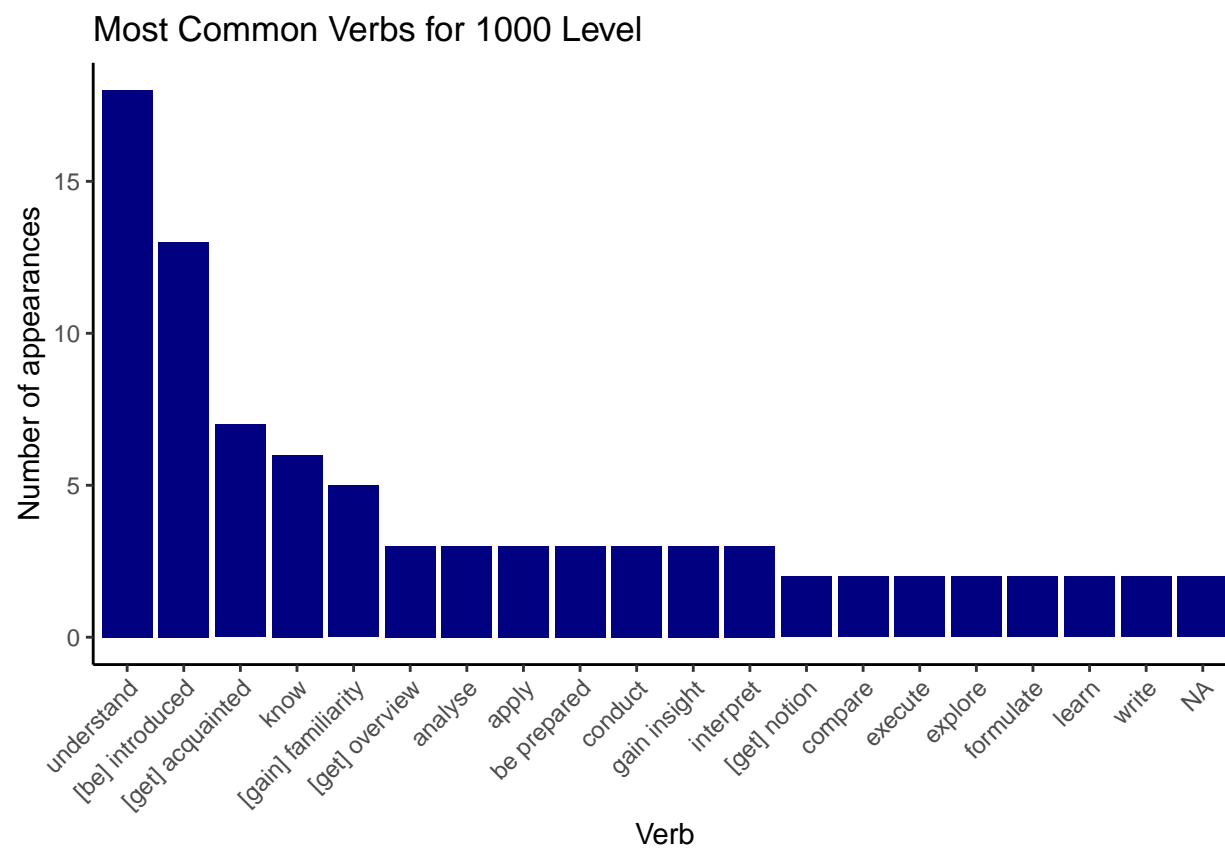
```
## [1] 856
```

we have 856 verbs (objectives). ###Graphs ####Universal Verbs Universal use of verbs:

```
## Warning: Ignoring unknown parameters: binwidth, bins, pad
```
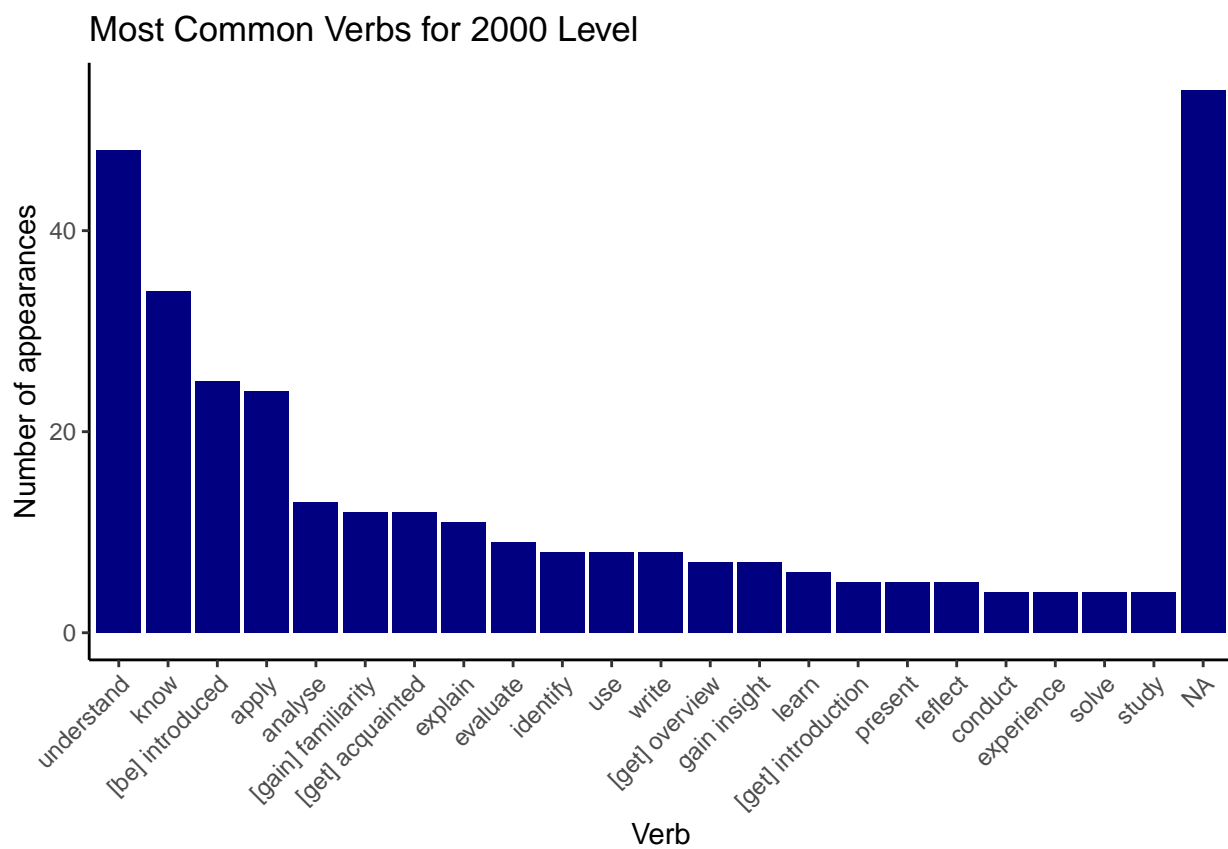

Most Common Verbs across all Courses
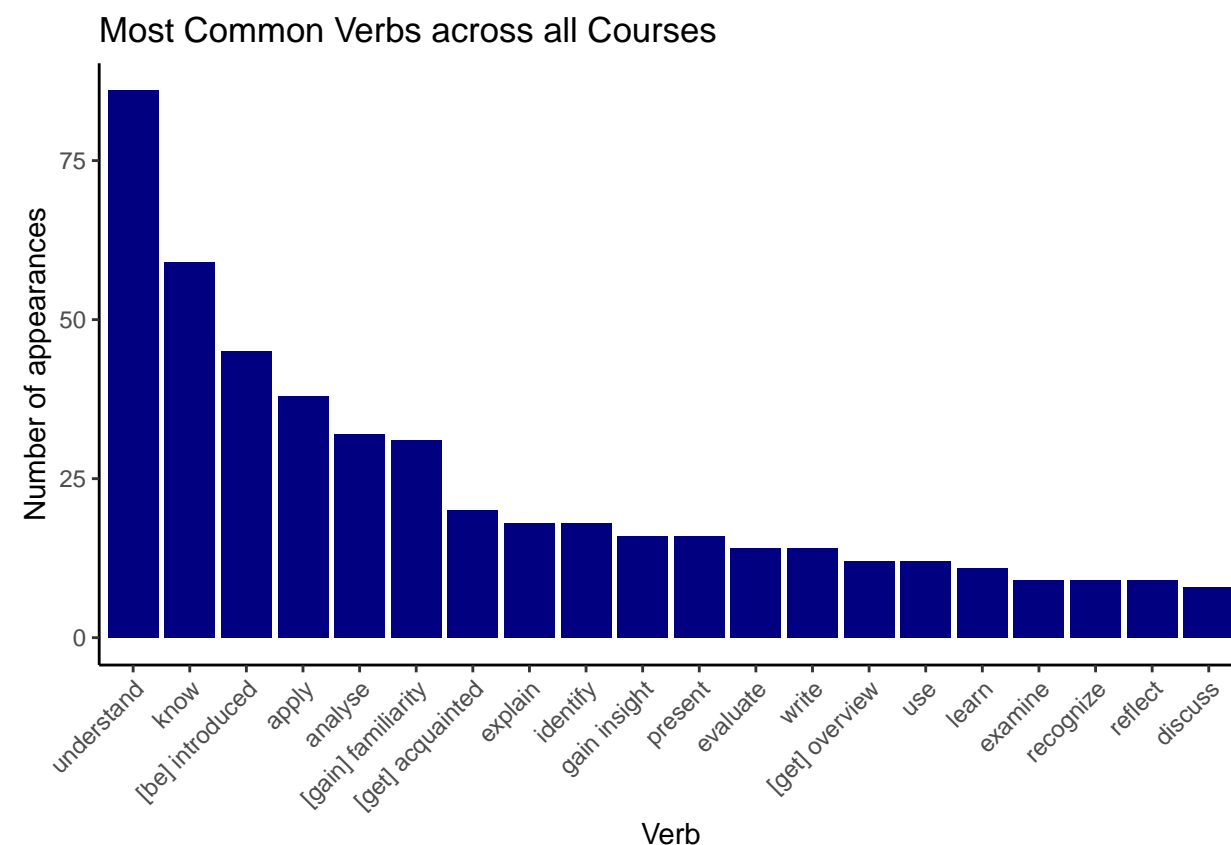
Breakdown by Level

```
## Warning: Ignoring unknown parameters: binwidth, bins, pad
```

Most Common Verbs for 1000 Level

```
## Warning: Ignoring unknown parameters: binwidth, bins, pad
```

Most Common Verbs for 2000 Level


```
## Warning: Ignoring unknown parameters: binwidth, bins, pad
```

Most Common Verbs for 3000 Level