FERRIS STATE UNIVERSITY

General Education Thresholds[*]

Standardizing the criteria of success for the revised General Education program

Dr. Clifton Franklund

General Education Coordinator

Fall 2017

Contents

Abstract

"Assessment is not a spreadsheet; it's a conversation." — Irmeli Halinen

A standardized scoring system for General Education assessment has been developed at Ferris State University. This system uses a series of five-value, four-point rubrics to evaluate student achievement. The rubrics were derived from the VALUE rubrics from the American Association of Colleges and Universities. Formulae have also been developed to convert assignment scores or standardized exam percentiles to a similar rubric scale. This will allow easier comparisons of student performances across the program, regardless of the assessment instrument used to evaluate their work. Finally, score thresholds have been defined for aggregate student scores. These criteria of success were selected based upon modeled score distributions. This report is meant to provide an opportunity for anyone to comment upon, suggest changes to, or otherwise improve this scoring system.

Introduction

Assessing the efficacy of a General Education program is an ambitious endeavor.

FERRIS STATE UNIVERSITY

Standardized scoring

Competency rubrics for individuals

Need thresholds for courses

Methods

Data provenance

Data provenance refers to a system that permits tracking of the origin, movement, modification, and utilization of data sets (Buneman et al., 2001). The provenance of General Education data will be explicitly declared to facilitate the reproducibility and extensibility of these studies.

Location of public website files

All files related to this report can be found online at the Open Science Framework (Nosek, 2012). This site contains all of the files needed to reproduce this report from the de-identified data set. The site's url is https://osf.io/t6u8m/.

Session information

This report was written using RStudio (RStudio Team, 2015) and the R statistical programming language (R Core Team, 2013). These products are free to download for PC, Macintosh, and Linux operating systems. The following information pertains to the session parameters used to generate this report. If you have trouble reproducing this report, it may be due to different session parameters. You may contact Dr. Franklund if you need assistance.

R version 3.4.3 (2017-11-30)

Platform: x86_64-apple-darwin15.6.0 (64-bit)

locale: en_US.UTF-8||en_US.UTF-8||en_US.UTF-8||C||en_US.UTF-8||en_US.UTF-8

attached base packages: stats, graphics, grDevices, utils, datasets, methods and base

other attached packages: pander(v.0.6.1), forcats(v.0.2.0), stringr(v.1.2.0), dplyr(v.0.7.4), purrr(v.0.2.4), readr(v.1.1.1), tidyr(v.0.8.0), tibble(v.1.4.2), ggplot2(v.2.2.1) and tidyverse(v.1.2.1)

loaded via a namespace (and not attached): xfun(v.0.1), reshape2(v.1.4.3), haven(v.1.1.1), lattice(v.0.20-35), colorspace(v.1.3-2), htmltools(v.0.3.6), yaml(v.2.1.16), rlang(v.0.1.6), pillar(v.1.1.0), foreign(v.0.8-69), glue(v.1.2.0), modelr(v.0.1.1), readxl(v.1.0.0), bindrcpp(v.0.2), bindr(v.0.1), plyr(v.1.8.4), munsell(v.0.4.3), gtable(v.0.2.0), cellranger(v.1.1.0), rvest(v.0.3.2), psych(v.1.7.8), evaluate(v.0.10.1), knitr(v.1.19), parallel(v.3.4.3), broom(v.0.4.3), Rcpp(v.0.12.15), backports(v.1.1.2), scales(v.0.5.0), jsonlite(v.1.5), mnormt(v.1.5-5), hms(v.0.4.1), digest(v.0.6.15), stringi(v.1.1.6), bookdown(v.0.6.2), grid(v.3.4.3), rprojroot(v.1.3-2), cli(v.1.0.0), tools(v.3.4.3), magrittr(v.1.5), lazyeval(v.0.2.1), crayon(v.1.3.4), pkg-config(v.2.0.1), xml2(v.1.2.0), lubridate(v.1.7.1), assertthat(v.0.2.0), rmarkdown(v.1.8), httr(v.1.3.1), rstudioapi(v.0.7), R6(v.2.2.2), nlme(v.3.1-131) and compiler(v.3.4.3)

Processing instructions

This project produced a computationally reproducible assessment report (this document). Anyone wishing to recreate this report from the source document will need to install the following on their computer:

FERRIS STATE UNIVERSITY

Table 1: Proportions for simulated data for classes of different abilities

Rubric	Level	Distribution 0	Distribution 1	Distribution 2	Distribution 3	Distribution 4
0	Deficient	0.50	0.10	0.00	0.00	0.00
1	Beginning	0.40	0.55	0.26	0.01	0.00
2	Progressing	0.09	0.30	0.49	0.39	0.10
3	Proficient	0.01	0.05	0.24	0.46	0.27
4	Advanced	0.00	0.00	0.01	0.14	0.63

1. An installation of the R programming language
2. An installation of the RStudio IDE
3. An installation of LaTeX

The necessary source files include the de-identified data set (BIOL200Data.csv), Rmarkdown code files (index.Rmd, 01-Introduction.Rmd, 02-Methods.Rmd, 03-Results.Rmd, 04-Discussion.Rmd, and 05-References.Rmd), bibtex reference file (references.bib), and custom art file in the /art folder.

To process the files, you must first open the project in RStudio. Click on the "Build Book" button in the Build menu. Bookdown allows you to build this project as git_book (html site), pdf_book (via LaTeX), or epub_book (compatible with iBooks and other e-book readers).

Citation of this work

Create proportional distributions

Generating simulations

Analysis

Results and Discussion

Summary statistics

Do you think that there are too many exams in this mix? What is the desired balance between exams, products, and performances for General Education?
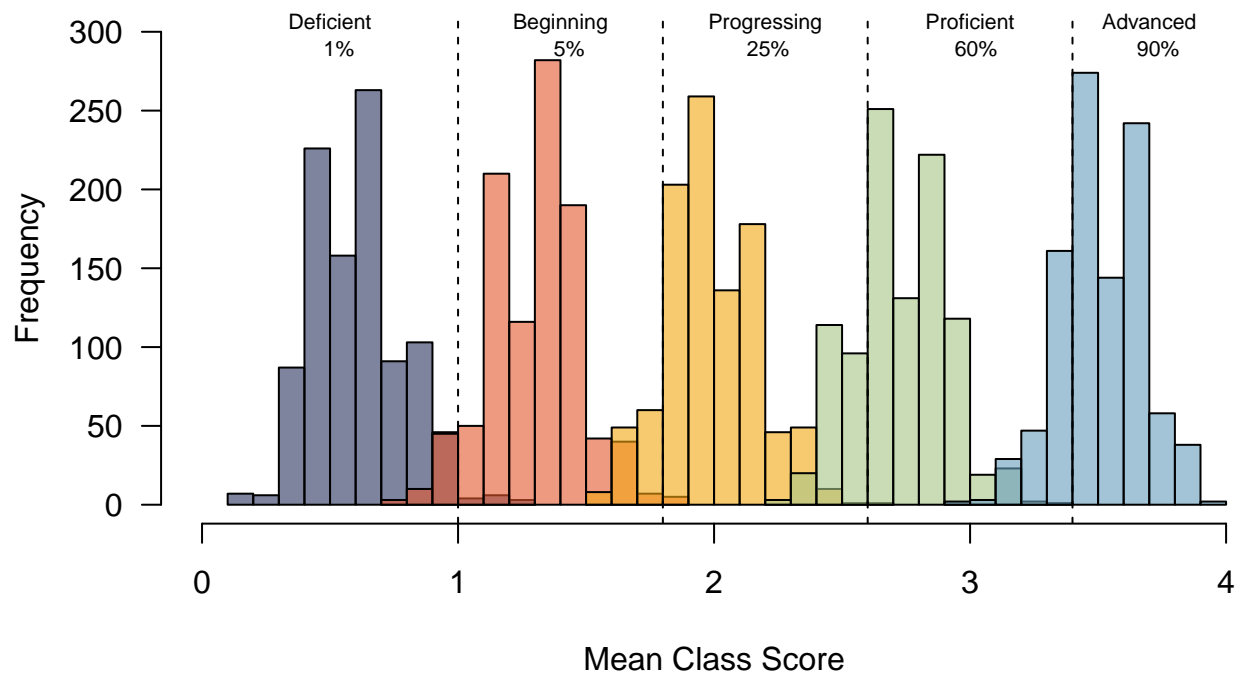
Figure 1: Score distributions from the simulated data

Table 2: Color pallet for score interpretation

Level	Score Range	Color (HEX)
Deficient	[0.00 - 1.00)	#29335c
Beginning	[1.00 - 1.80)	#e4572e
Progressing	[1.80 - 2.60)	#f3a712
Proficient	[2.60 - 3.40)	#a8c686
Advanced	[3.40 - 4.00]	#669bbc

Figure 2: Color scheme

FERRIS STATE UNIVERSITY
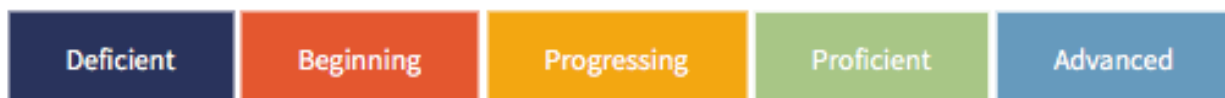
Histograms

Color scheme

References

Buneman, P., Khanna, S., and Wang-Chiew, T. (2001). Why and Where: A Characterization of Data Provenance, pages 316–330. Springer Berlin Heidelberg, Berlin, Heidelberg.

Nosek, B. (2012). An Open, Large-Scale, Collaborative Effort to Estimate the Reproducibility of Psychological Science. Perspect. Psychol. Sci., 7(6):657–660.

R Core Team (2013). R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria.

RStudio Team (2015). RStudio: Integrated Development Environment for R. RStudio, Inc., Boston, MA.