Assessing Core Competencies: Results of Quantitative Literacy and Reasoning Assessment

Graduating Seniors
2022 Fañomnåkan (Spring)

UNIVERSITY OF GUAM
UNIBETSEDÅT GUAHAN

Quantitative Literacy and Reasoning Assessment 2022 Fañomnåkan (Spring) Highlights

The Quantitative Literacy and Reasoning Assessment (QLRA), an online multiple-choice test, developed by Dr. Eric Gaze at Bowdoin College is a tool for assessing quantitative literacy among US four-year colleges and universities. The University's Mathematics Department began using this instrument in 100 and 400 level Math courses since 2014. The University Assessment Committee adopted the QLRA in 2017 as the Institutional Instrument for Institutional-Level assessment.

Possible scores for this assessment range from 0% through 100%. Of the 267 graduating seniors who took the assessment across all disciplines, the average score was **43.1%.**

This average score is a 0.3-percentage point *increase* from Fanuchånan 2021. Since the Fañomnåkan 2021 semester, there has been no downward trend in the average score. This graph displays

Average QLRA Scores
Graduating Seniors 2022 Fañomnakan

CLASS (n=39): 37.7, CNAS (n=59): 50.4, SBPA (n=85): 41.3, SOE (n=25): 34.4, SENG (n=7): 57.9, SOH (n=52): 43.8

College/School — UOG Total (n=267)
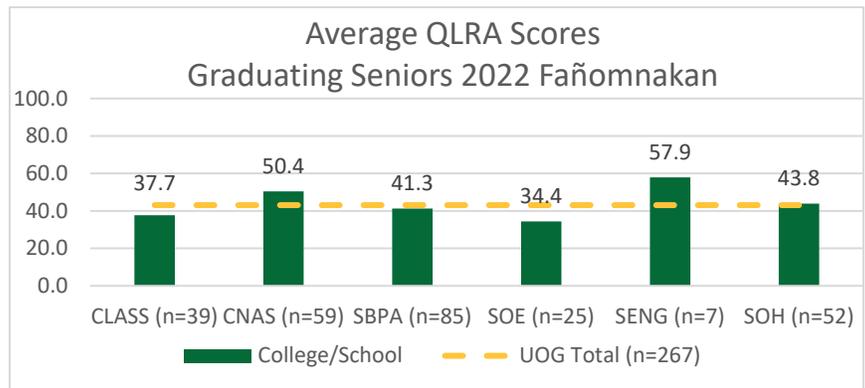
the average scores of students in each college/school with the UOG average at 43.1**%**. This report includes more detailed results of scores disaggregated by Major, and by College/School. To assure students cannot be easily identified, we did not report data for majors with less than three students.

To serve as a factor in the analysis of results, students were asked if they took the following courses at UOG: MA-085: Fundamentals of Math, MA-110: Basic Mathematical Applications, and MA-151: Introductory Statistics.

> **41%** of seniors indicated that they had taken MA-085 and received an average score of **37.5%** while the students who did not take MA-085 scored an average of **46.9%.** In the last 10 semesters, the average scores of seniors who did not take MA-085 is higher than seniors who took MA-085. While this course is not required, students who are placed into developmental math must pass this course before proceeding with MA-110 or higher.

> **55%** of seniors indicated they took MA-110 and received an average score of **39.1%.** The **45%** who did not take MA-110 received an average score of **47.9%.** In the last 10 semesters, the average scores of seniors who did not take MA-110 is higher than students who took MA-110. Although MA-110 is a general education requirement, students may opt to take an equivalent course or higher.

> **63%** of seniors had taken MA-151 and their average score was **44.2%.** Those who did not take the course received an average score of **41.2%**. This result contrasts with the previous 6 semesters, where the average scores of seniors of who took Introductory Statistics were lower than those who did not take the course.

It is important to note that in response to safety measures implemented due to COVID-19, testing was no longer held in a proctored environment on campus. Seniors were permitted to complete this assessment online at a time of their own choosing off campus.

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Quantitative Literacy and Reasoning Assessment - Graduating Seniors Average Scores

|	AY18-19		AY19-20		AY20-21		AY21-22		Four Year Trend
	2018 Fall Fanuchånan	2019 Spring Fañomnåkan	2019 Fall Fanuchånan	2020 Spring Fañomnåkan	2020 Fall Fanuchånan	2021 Spring Fañomnåkan	2021 Fall Fanuchånan	2022 Spring Fañomnåkan	
Count	173	286	142	252	124	276	147	267	208
Avg Grade	35.7	41.3	34.8	40.0	39.0	42.8	42.8	43.1	40
Std Dev	17.2	17.9	16.7	18.3	18.0	20.6	19.3	19.9	18
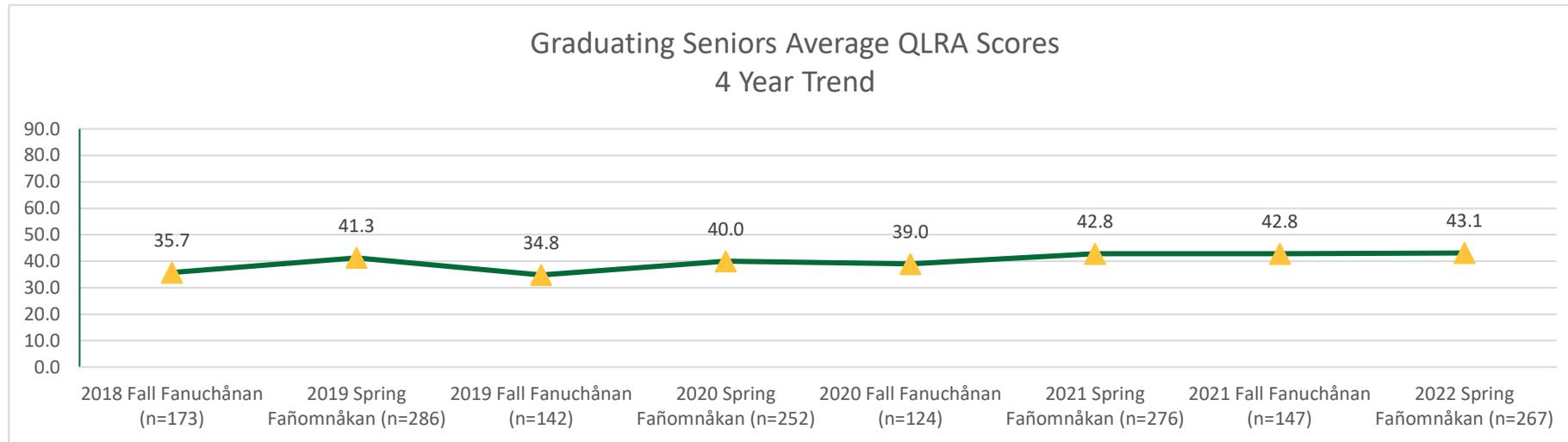
Graduating Seniors Average QLRA Scores
4 Year Trend

2018 Fall Fanuchånan (n=173)	2019 Spring Fañomnåkan (n=286)	2019 Fall Fanuchånan (n=142)	2020 Spring Fañomnåkan (n=252)	2020 Fall Fanuchånan (n=124)	2021 Spring Fañomnåkan (n=276)	2021 Fall Fanuchånan (n=147)	2022 Spring Fañomnåkan (n=267)
35.7	41.3	34.8	40.0	39.0	42.8	42.8	43.1

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2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment (QLRA) Average Scores by Course for Graduating Seniors

|	Total	Took MA 085?		Took MA 110?		Took MA 151?	
		Yes	No	Yes	No	Yes	No
Count	267	109	158	147	120	167	100
Percent	100%	41%	59%	55%	45%	63%	37%
Avg Grade	43.1	37.5	46.9	39.1	47.9	44.2	41.2
Std Dev	19.9	17.4	20.6	18.4	20.6	19.2	20.8

Average QLRA Scores for Graduating Students who have taken MA 085, MA 110, and MA 151

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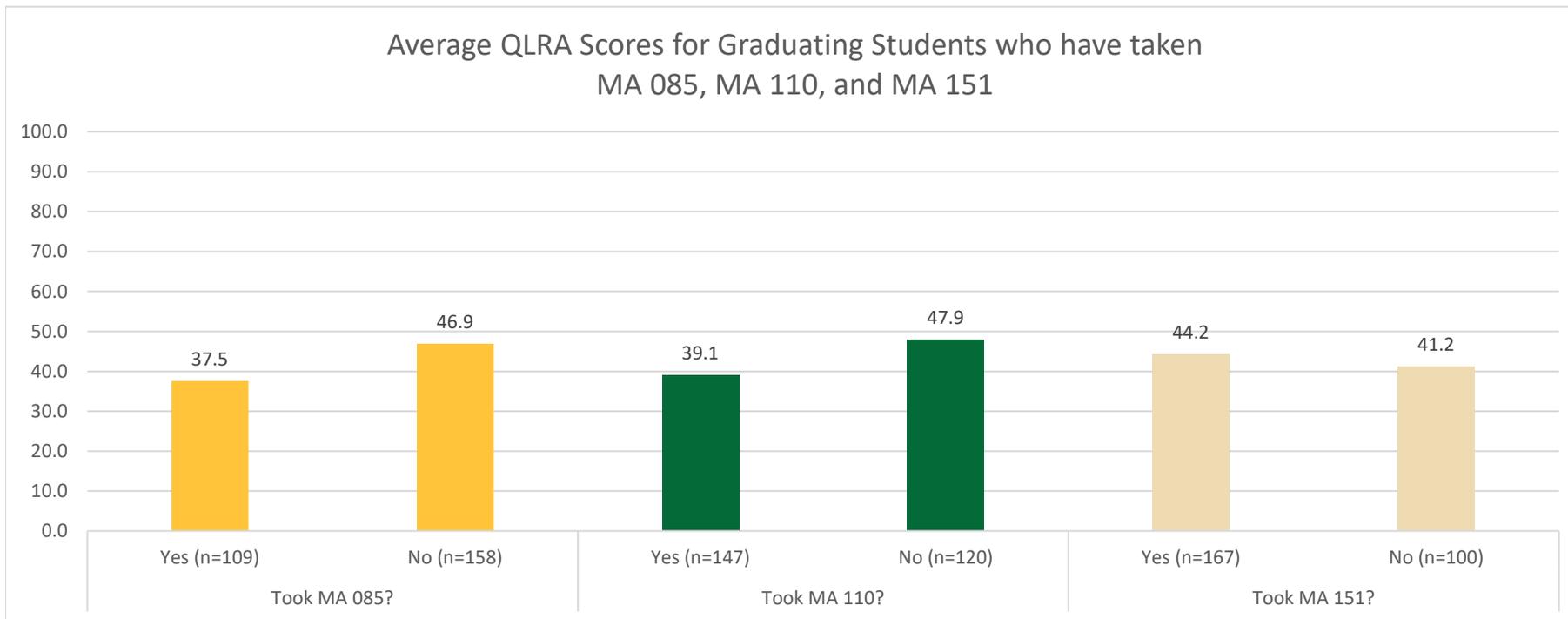
2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment (QLRA) Average Scores by Gender for Graduating Seniors

|	Total	Gender		
		Male	Female	Declined response
Count	267	105	151	11
Percent	100%	39%	57%	4%
Avg Grade	43.1	46.5	41.1	37.7
Std Dev	19.9	20.6	19.5	13.1

Average QLRA Scores by Gender
Graduating Seniors 2022 Fañomnåkan

Male (n=105)	46.5
Female (n=151)	41.1
Declined response (n=11)	37.7

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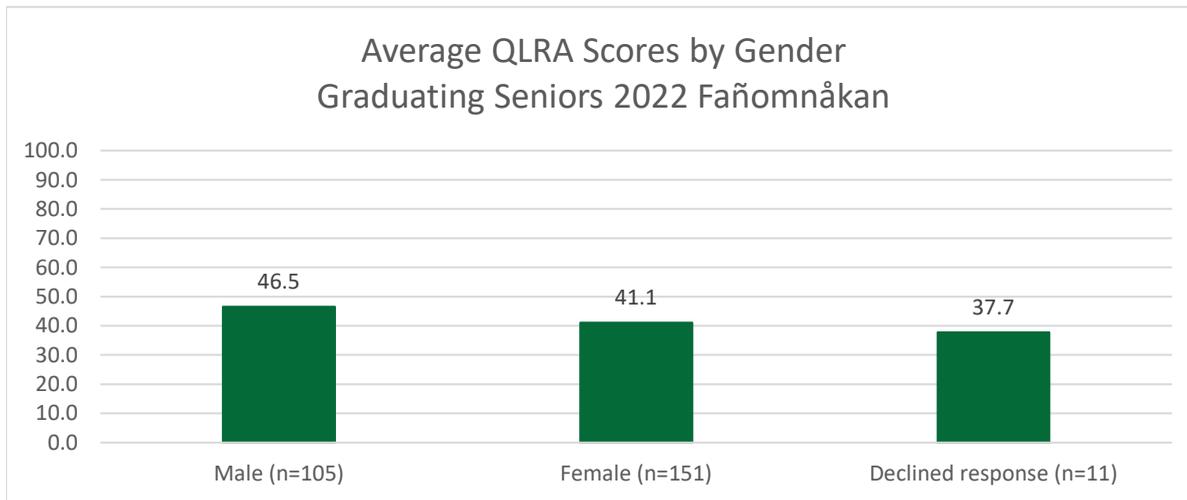
2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment Math Attitudes - Indirect Assessment

Statement	Response	Count	Percent
Numerical information is very useful in everyday life	Strongly Agree	153	57%
Numbers are not necessary for most situations	Strongly Disagree	51	19%
Quantitative information is vital for accurate decisions	Strongly Agree	124	46%
Understanding numbers is as important in daily life as reading and writing	Strongly Agree	184	69%
It is a waste of time to learn information containing a lot of numbers	Strongly Disagree	140	52%

Relationship between QLRA Test Scores and Math Attitude

$y = 1.3462x + 15.084$

QLRA Test Score (y-axis)
Math Attitudes Score (x-axis)
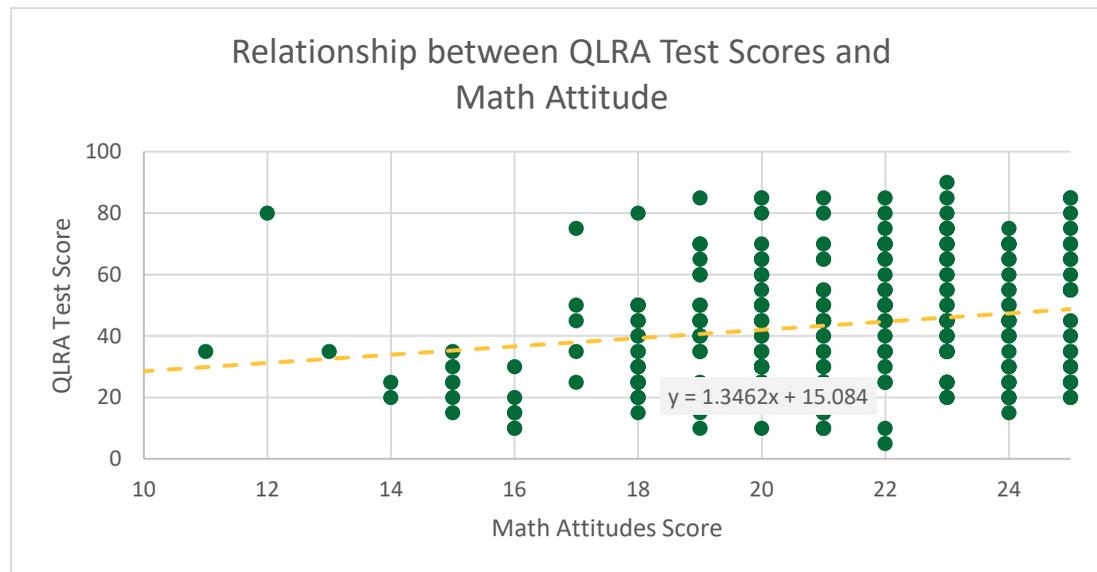
Higher Math Attitudes Scores correspond to more positive attitudes towards Math. The highest possible Math Attitude Score is 25.

The QLRA has been administered to graduating seniors as a requirement for graduation since Spring 2017.

Every semester since then has shown a positive relationship between math attitudes and QLRA test scores with the exception of the 2020 Fanuchånan semester.

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2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment Average Scores by College/School

College/School	AVERAGE GRADE	STDEV
College of Liberal Arts and Social Sciences - CLASS (n=39)	37.7	16.5
College of Natural and Applied Sciences - CNAS (n=59)	50.4	21.1
School of Business and Public Administration - SBPA (n=85)	41.3	21.5
School of Education - SOE (n=25)	34.4	15.5
School of Engineering - SENG (n=7)	57.9	12.9
School of Health - SOH (n=52)	43.8	17.2
UOG Total (n=267)	43.1	19.9
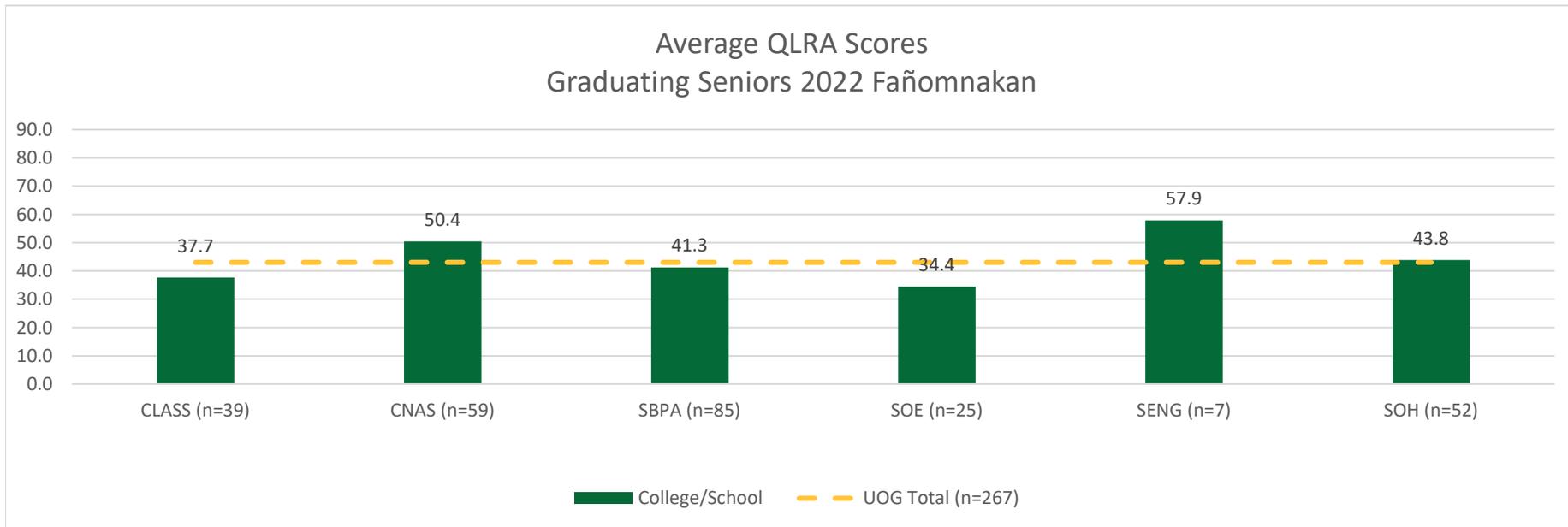
Average QLRA Scores
Graduating Seniors 2022 Fañomnakan

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2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment Average Scores by Major - CLASS

| MAJOR	AVERAGE GRADE	STDEV
Communication Studies (n=7)	42.1	11.1
English (n=7)	34.3	10.6
**Fine Arts (n=6)	28.3	17.8
History (n=3)	43.3	18.9
Political Science (n=7)	50.0	22.2
Psychology (n=7)	32.9	15.5
CLASS Subtotal (n=39)	37.7	16.5
UOG Total (n=267)	43.1	19.9

Average QLRA Scores - CLASS
Graduating Seniors 2022 Fañomnåkan
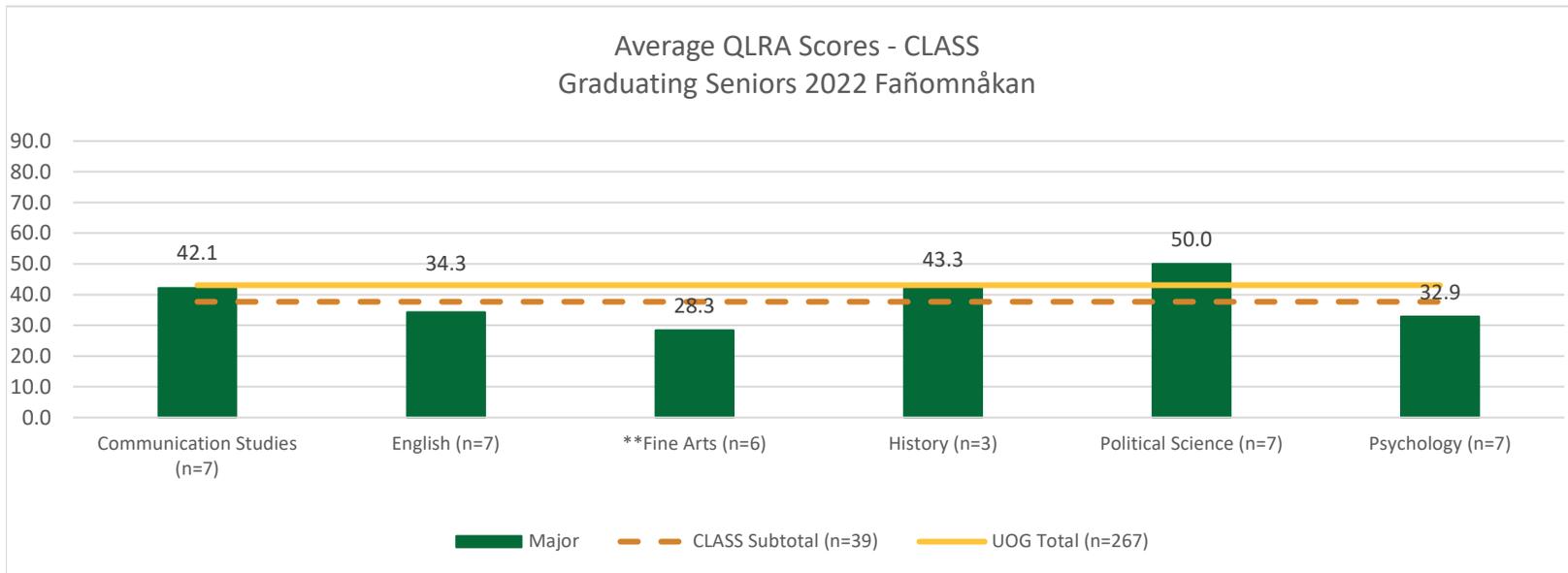
*The Philosophy program did not have enough students to report

***Fine Arts* combines Fine Arts/Art and Fine Arts/Theater majors

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2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment Average Scores by Major - CNAS

MAJOR	AVERAGE GRADE	STDEV
Biology (n=30)	50.0	21.0
Chemistry (n=8)	55.6	22.4
Computer Info System (n=3)	41.7	18.9
Computer Science (n=12)	55.0	21.3
Mathematics (n=4)	50.0	22.7
CNAS Subtotal (n=59)	50.4	21.1
UOG Total (n=267)	43.1	19.9

Average QLRA Scores - CNAS
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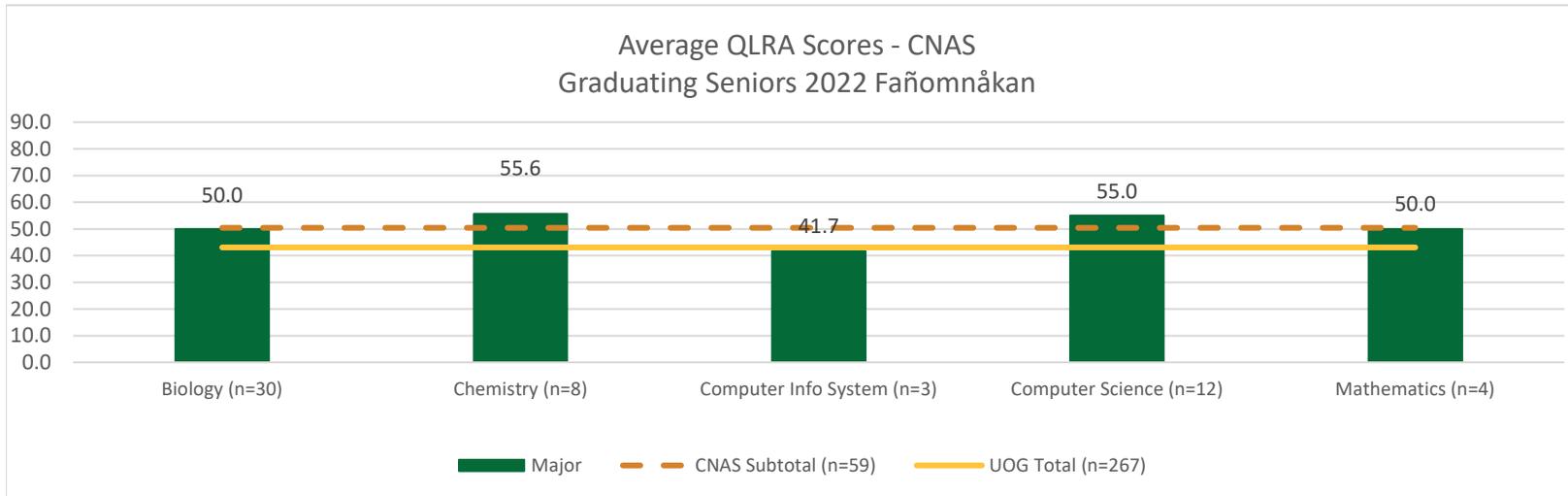
*The Agriculture and Life Sciences program did not have enough students to report

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2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment Average Scores by Major - SBPA

MAJOR	AVERAGE GRADE	STDEV
Accounting (n=18)	60.3	18.3
Business Administration (n=40)	38.9	18.7
Criminal Justice (n=23)	33.0	21.1
Public Administration (n=4)	27.5	16.6
SBPA Subtotal (n=85)	41.3	21.5
UOG Total (n=267)	43.1	19.9
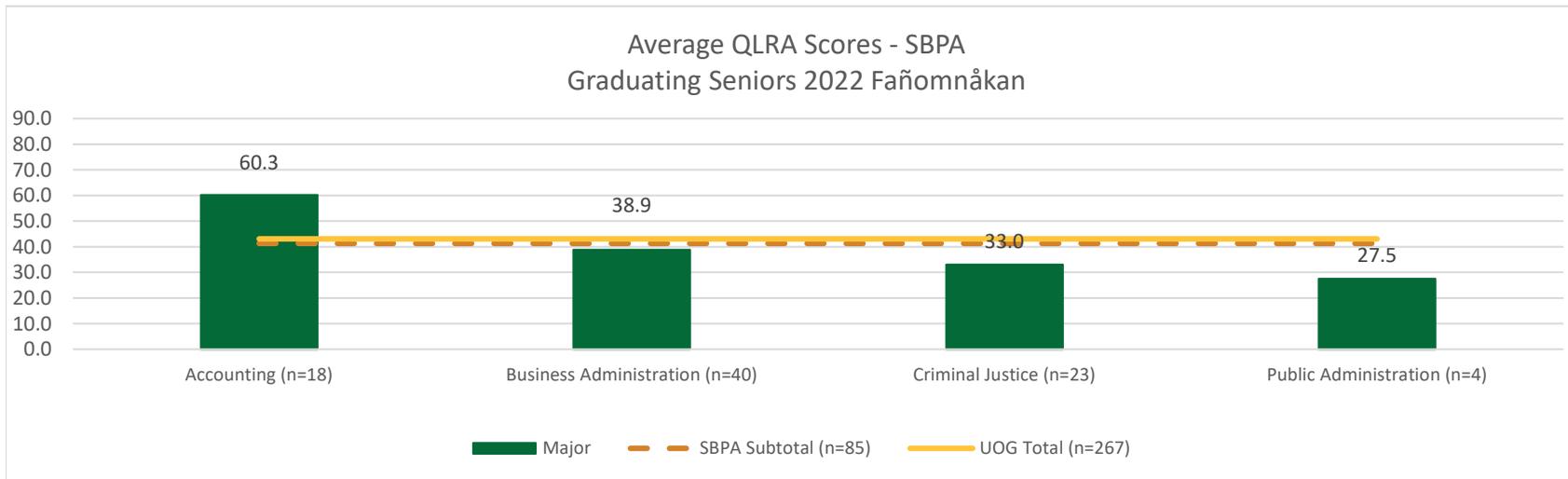
Average QLRA Scores - SBPA
Graduating Seniors 2022 Fañomnåkan

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2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment Average Scores by Major - SOE

MAJOR	AVERAGE GRADE	STDEV
Elementary Education (n=12)	31.3	10.3
Secondary Education (n=13)	37.3	19.1
SOE Subtotal (n=25)	34.4	15.5
UOG Total (n=267)	43.1	19.9
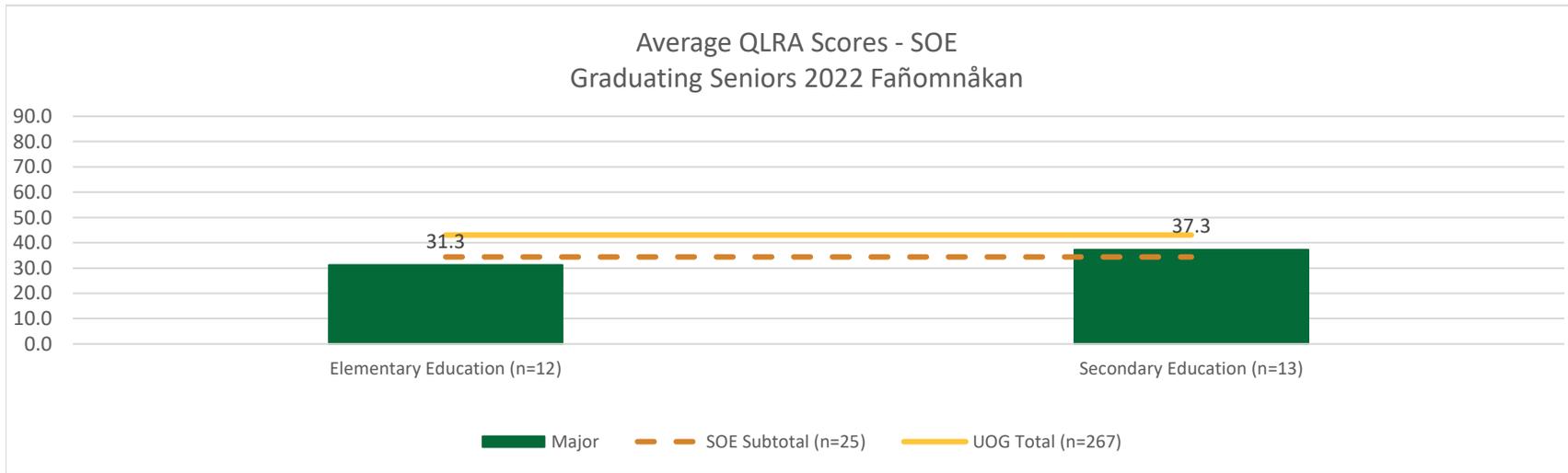
Average QLRA Scores - SOE
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2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment Average Scores by Major - SENG

MAJOR	AVERAGE GRADE	STDEV
Civil Engineering (n=7)	57.9	12.9
SENG Subtotal (n=7)	57.9	12.9
UOG Total (n=267)	43.1	19.9
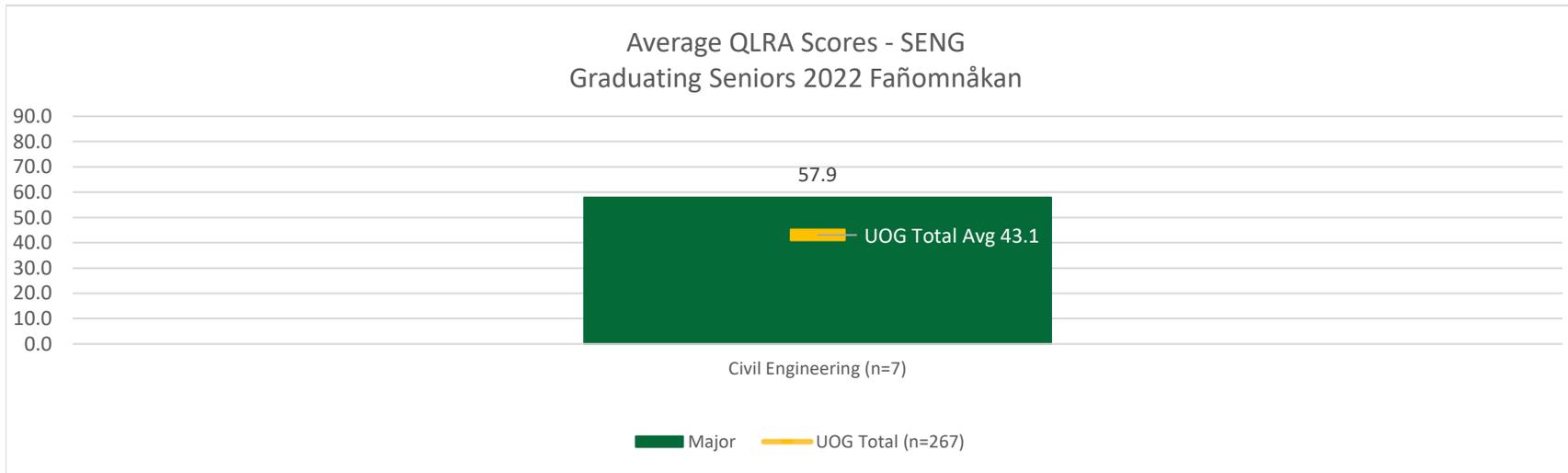
Average QLRA Scores - SENG
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2022 Fañomnåkan Quantitative Literacy and Reasoning Assessment Average Scores by Major - SOH

MAJOR	AVERAGE GRADE	STDEV
Health Science (n=10)	52.0	19.7
Nursing (n=31)	46.0	15.7
Social Work (n=11)	30.5	12.1
SOH Subtotal (n=52)	43.8	17.2
UOG Total (n=267)	43.1	19.9

Average QLRA Scores - SOH
Graduating Seniors 2022 Fañomnåkan