

Ontario Colleges Mathematics Association (OCMA) 2021 Conference *Pictures at an Exhibition: Graphical Representations of Fall 2020 Student Performance in Math Courses*

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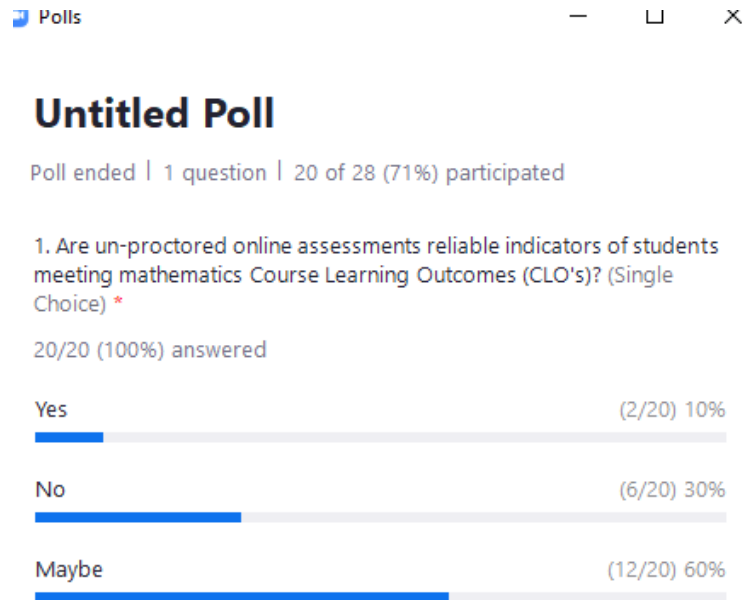
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October 2021



FANSHAWE

“Pre-assessment”



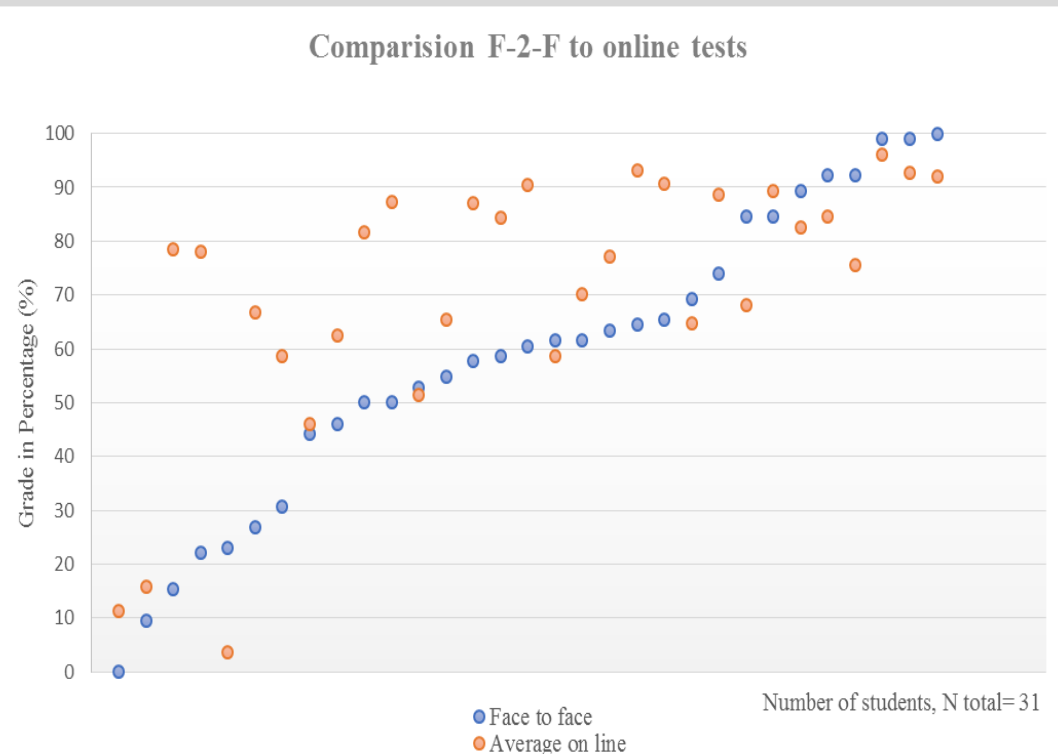
Overview

- In Fall 2020, we had the rare opportunity of having both online assessments and in-person evaluations during the pandemic. We'll show visual depictions of student achievement, but will leave the interpretations up to you. Come wander the halls of this art gallery to see what you see!

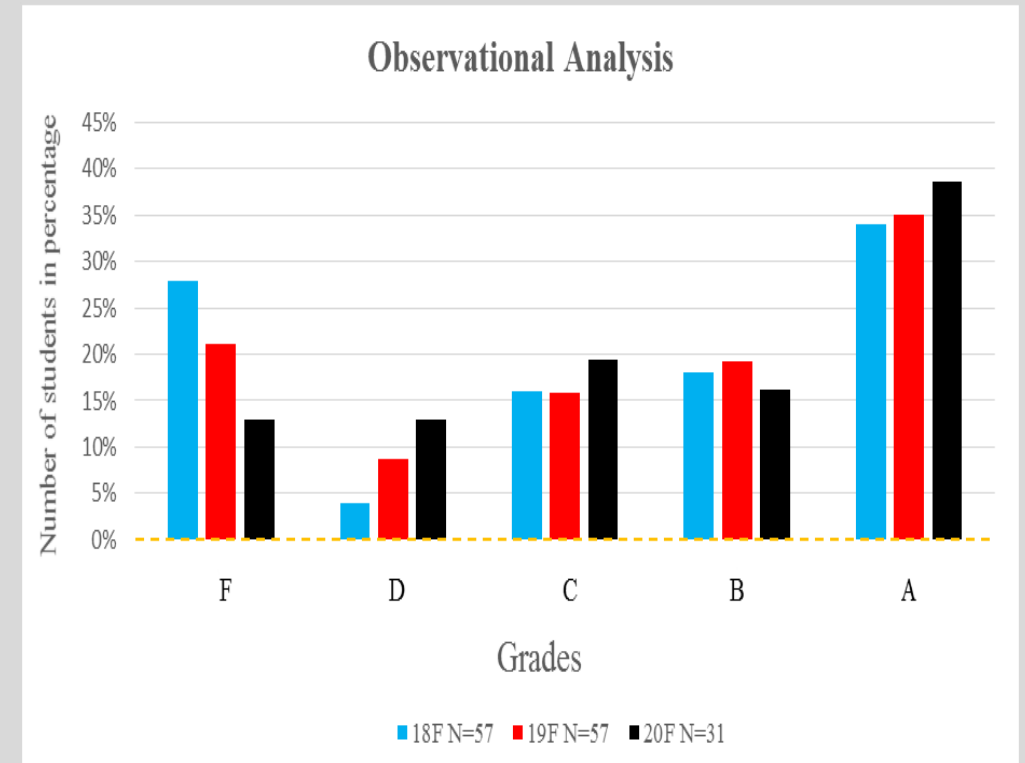
Professor “Gray” Fall 2020 (F20) Background

- One math course
 - Level 1 – aka semester 1
 - Ontario College Diploma
- Online Assessments
 - Can be assignments, quizzes, tests (primarily open answer/requirements to show work), in-class activities, anything
 - Unproctored, online
 - Assignments and quizzes are equally weighted (40% of final grade), Online tests 30% of final grade
- In-Person Tests
 - One per course
 - Proctored
 - Two-hours, all open answer (no multiple choice)
 - Face-to-face
 - “Must pass” (50% or higher)
 - 30% of final grade
 - Delivered in Week 8

Graph 1: This graph represents a comparison between the average of two online and one face to face math tests in Fall 2020



Graph 2: This graph represents a comparison of consecutive three years of one math course regarding adjusted final grade.



Professor “Gray” was the professor of record for all terms.

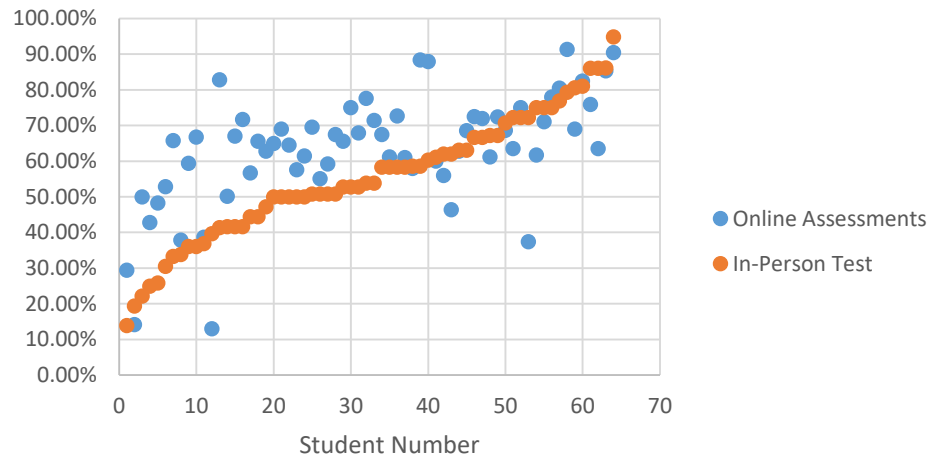
- Fall 2020 term online delivery
- All other terms in-person

Professor “Blue” F20 Background

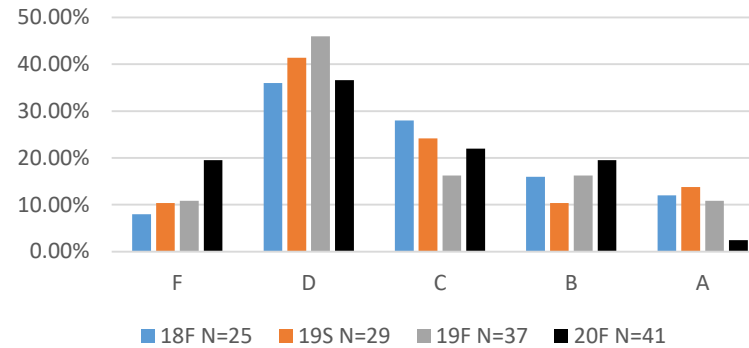
- Three different math courses
 - Mix of levels (Level 1, Level 5 – aka semester 1, semester 5)
 - Mix of diploma/Bachelor’s Degree/Post-Graduate Certificate programs
- Online Assessments
 - Can be assignments, quizzes, tests (primarily open answer/requirements to show work), in-class activities, anything
 - Unproctored, online
 - All equally weighted (total of 40% or 50% of final grade)
- In-Person Tests
 - One per course
 - Proctored
 - Two-hours, all open answer
 - Face-to-face
 - “Must pass” (50% or higher)
 - 50% or 60% of final grade
 - Delivered in Week 10 or Week 11
 - Some students wrote twice (highest score kept)

Professor “Blue” F20 Observational Analysis

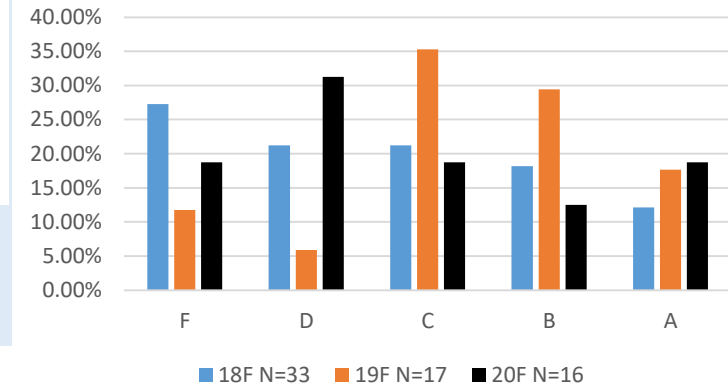
20F Online Assessments and In-Person Test Scores
(3 different math courses) Ntotal = 64,
Sorted by In-Person Test Score



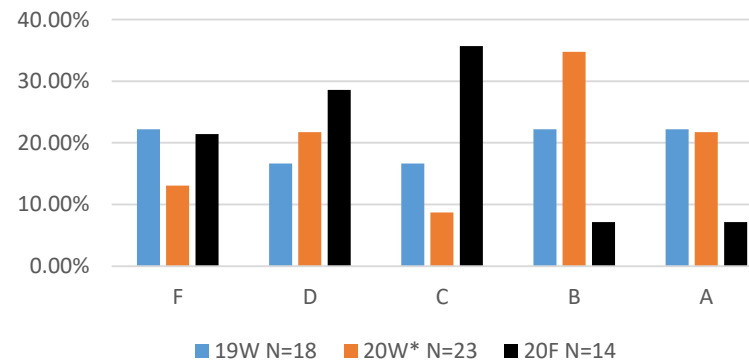
Course 1



Course 3



Course 2



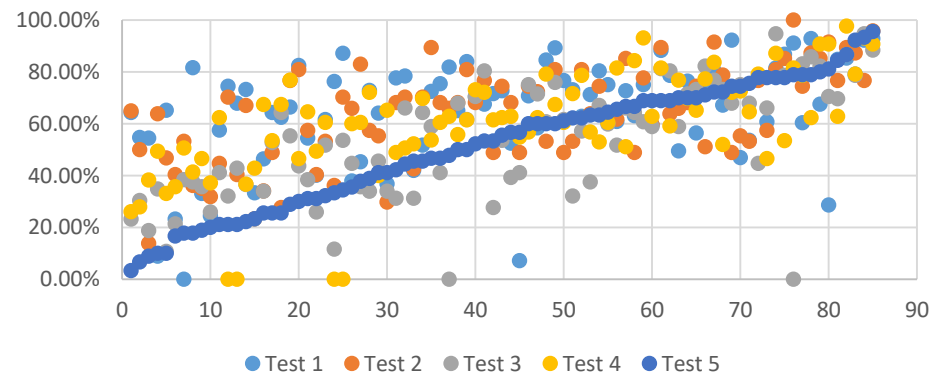
- Professor “Blue” was the professor of record for all terms
- Fall 2020 term online delivery
 - Winter 2020 term started in-person, ended online
 - All other terms in-person

Professor “Pink” F20 Background

- One math courses with three sections
 - Level 1 course – aka semester 1
- Online Assessments
 - Can be assignments, quizzes, tests (primarily open answer/requirements to show work), in-class activities, anything
 - Unproctored, online
 - Pre-determined weighting structure used – online tests were not weighted the same as assignments
- In-Person Tests
 - One per course
 - Proctored
 - Three-hours, all open answer
 - Face-to-face
 - “Must pass” (50% or higher)
 - 20% of final grade
 - Delivered in week 13

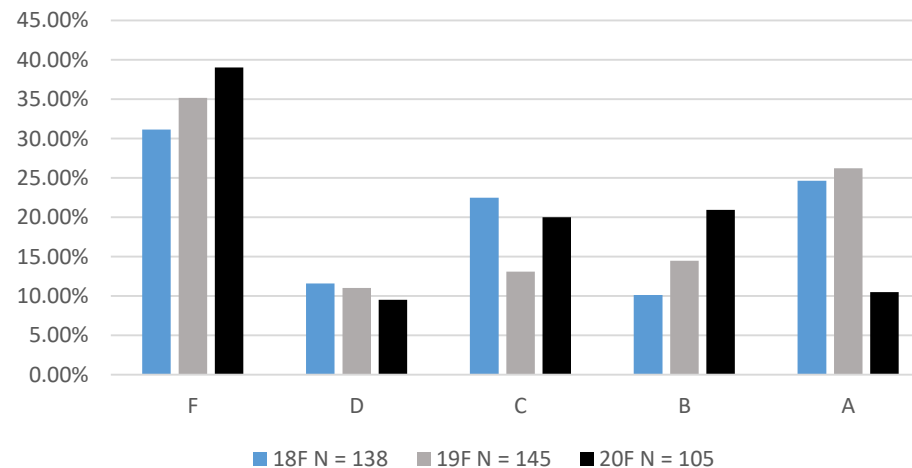
Professor “Pink” F20 Observational Analysis

20F Online Test Score and In-Person Test Scores
(1 math course) Ntotal = 85
Sorted by In-person Test Score (Test 5)



Course 1

20F Online Course Work and In-Person Test Scores (1 math course) Ntotal = 85
Sorted by In-person Test Score (Test 5)

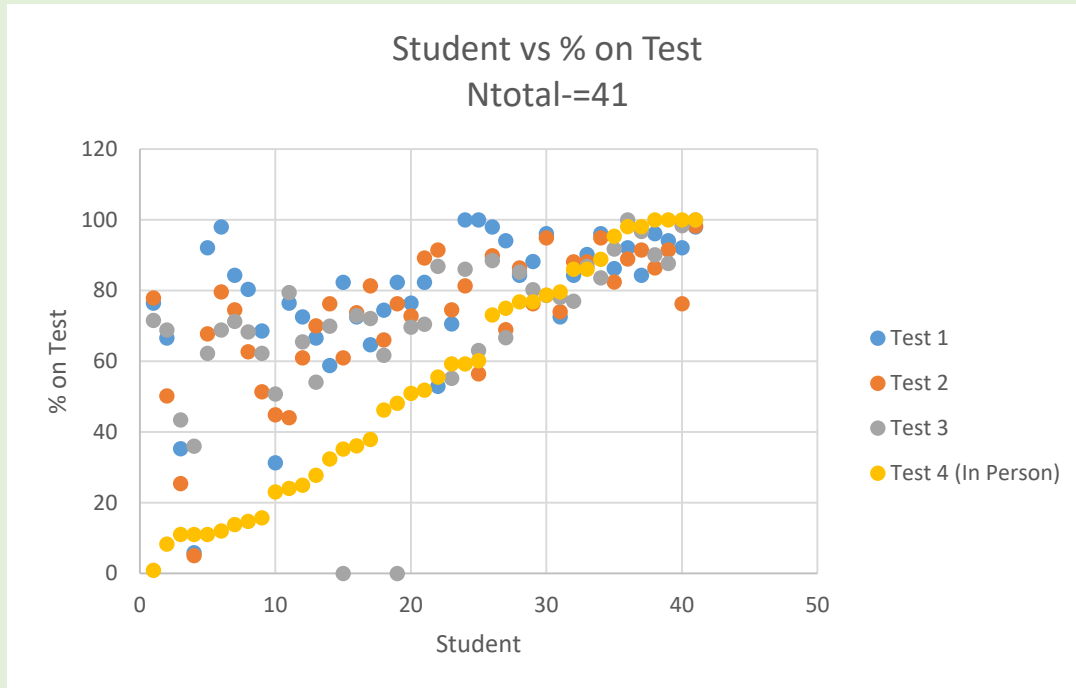


- ← Professor “Pink” was the professor of record for all terms.
- Fall 2020 term online delivery
 - All other terms in-person

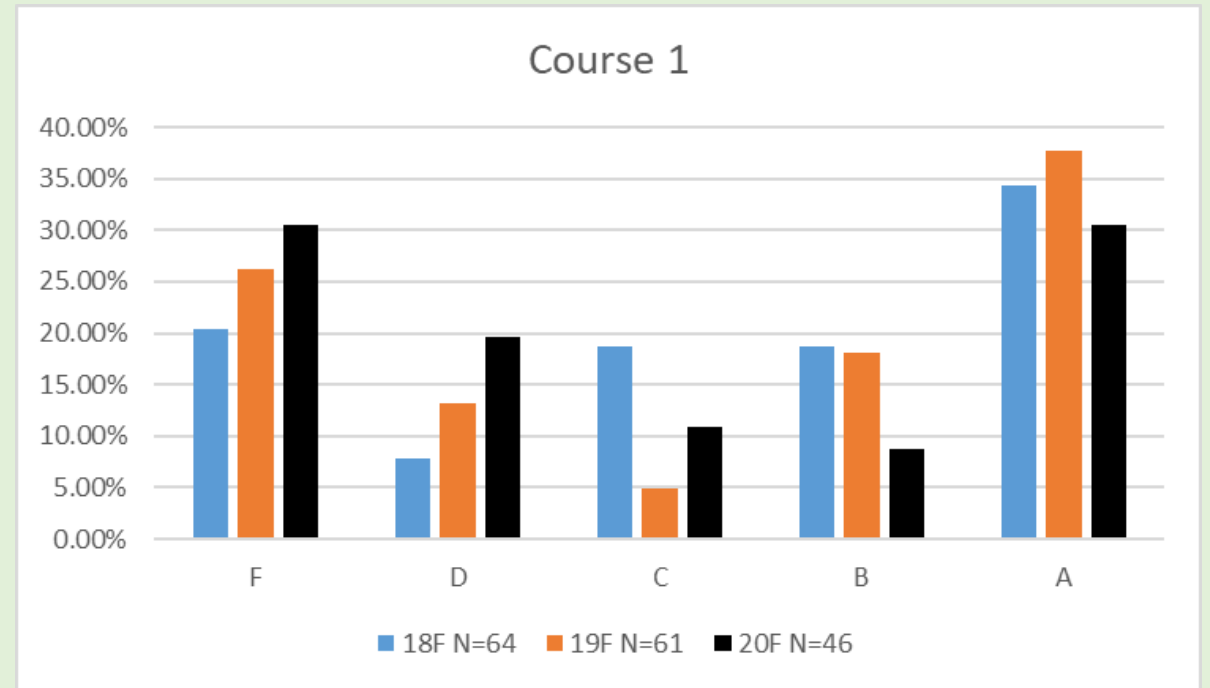
Professor “Green” F20 Background

- One math course
 - Level 1 – aka semester 1
 - Diploma program
- Online Assessments
 - Test1, Test 2 and Test 3 (primarily open answer/requirements to show work)
 - Unproctored, online
 - Test 1 – 15%, Test2 – 15% and Test 3 – 15%
 - Did not include Assignments and Quizzes
- In-Person Tests
 - One per course
 - Proctored
 - Three-hours, all open answer
 - Face-to-face
 - “Must pass” (50% or higher)
 - 25% of final grade
 - Delivered in Week 13

Professor “Green” F20 Observational Analysis



Students are arranged from lowest to highest mark on the in person test (Test 4)



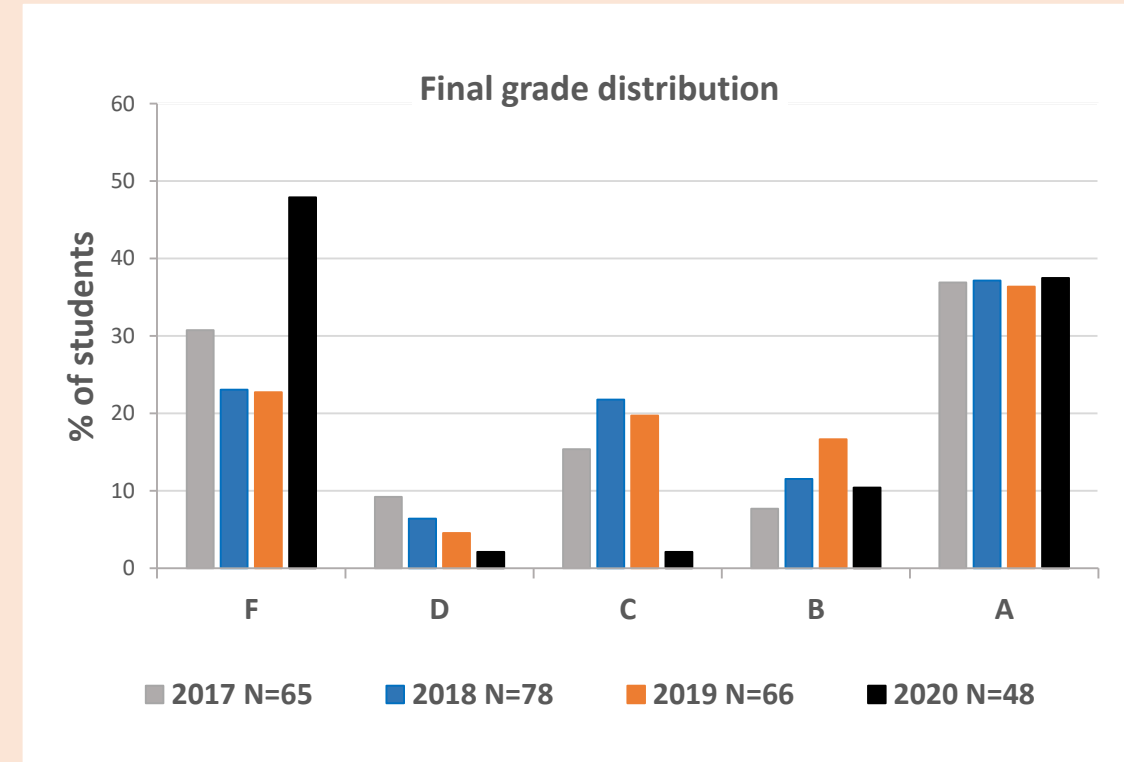
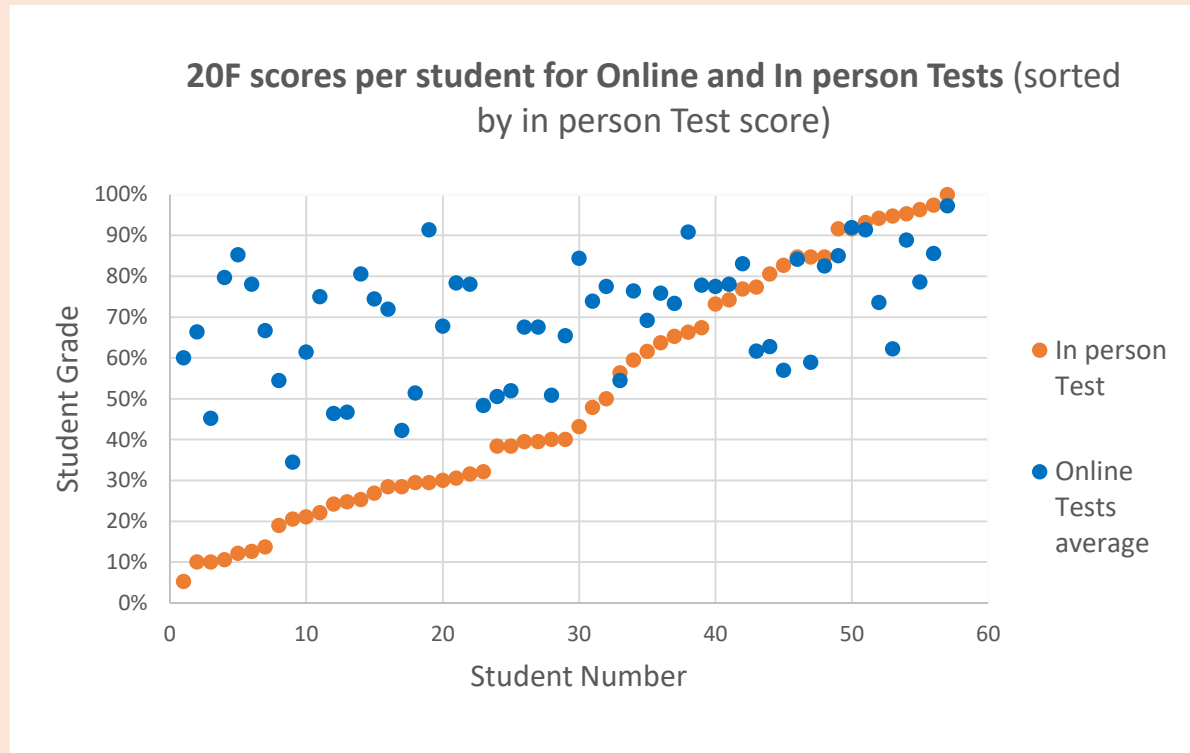
Professor “Green” was the professor of record for all terms.

- Fall 2020 term online delivery
- All other terms in-person

Professor “Orange” F20 Background

- One math course
 - Level 1 –aka semester 1
 - Diploma program
- Online Assessments
 - Average of Test 1 (10%) and Test 2 (20%), primarily open answer/requirements to show work
 - Unproctored, online
 - Average of 10 quizzes: 25%
 - Did not include online Assignments (unlimited untimed attempts 25%)
- In-Person Test
 - One Proctored test
 - Three-hours, all open answer
 - Face-to-face
 - “Must pass” (with 50% or higher)
 - 20% of final grade
 - Delivered in Week 13

Professor “Orange” F20 Observational Analysis



Observations from October 2021 OCMA Conference Attendees

- The main challenge in remote delivery may be getting students to engage.
- Non-proctored assessments may lead to less academic integrity.
- Perhaps a “must-pass” test may have been too anxiety inducing.
- In courses with high student enrollment, colleges may not have observed wholesale cheating (statistically speaking)
- We don’t know the phenomena that cause the disparity in student performance online vs. performance in-person
- The graphs may show more variation in online “grades” vs. in-person “grades”
- Which method evaluates the “knowledge” of the students?
- “Calculation/Computation” questions may be more prone to lack of academic integrity

“Post-assessment”

 Polls

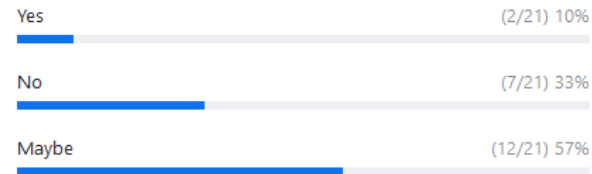
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Untitled Poll

Poll ended | 1 question | 21 of 24 (87%) participated

1. Are un-proctored online assessments reliable indicators of students meeting mathematics Course Learning Outcomes (CLO's)? (Single Choice) *

21/21 (100%) answered



Stop Sharing

Backup Slides

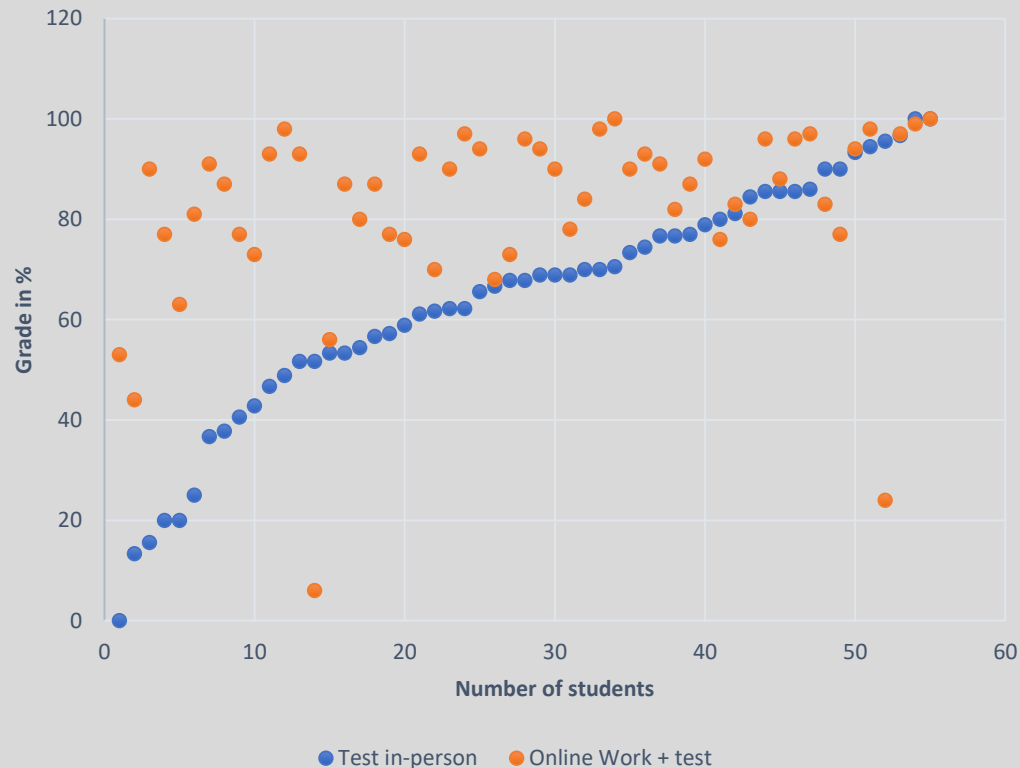
Professor “Gray” Winter 2021 (W21) Background

- One math course (Different than the math course in F2020)
 - Level 2 – aka semester 2
 - Ontario College Diploma
- Online Assessments
 - Can be assignments, quizzes, tests (primarily open answer/requirements to show work), in-class activities, anything
 - Unproctored, online
 - Assignments and quizzes are equally weighted (60% of final grade), Online tests 20% of final grade
- In-Person Tests
 - One per course
 - Proctored
 - Three-hours, all open answer (no multiple choice)
 - Face-to-face
 - “Must pass” (50% or higher)
 - 20% of final grade
 - Delivered in Week 7

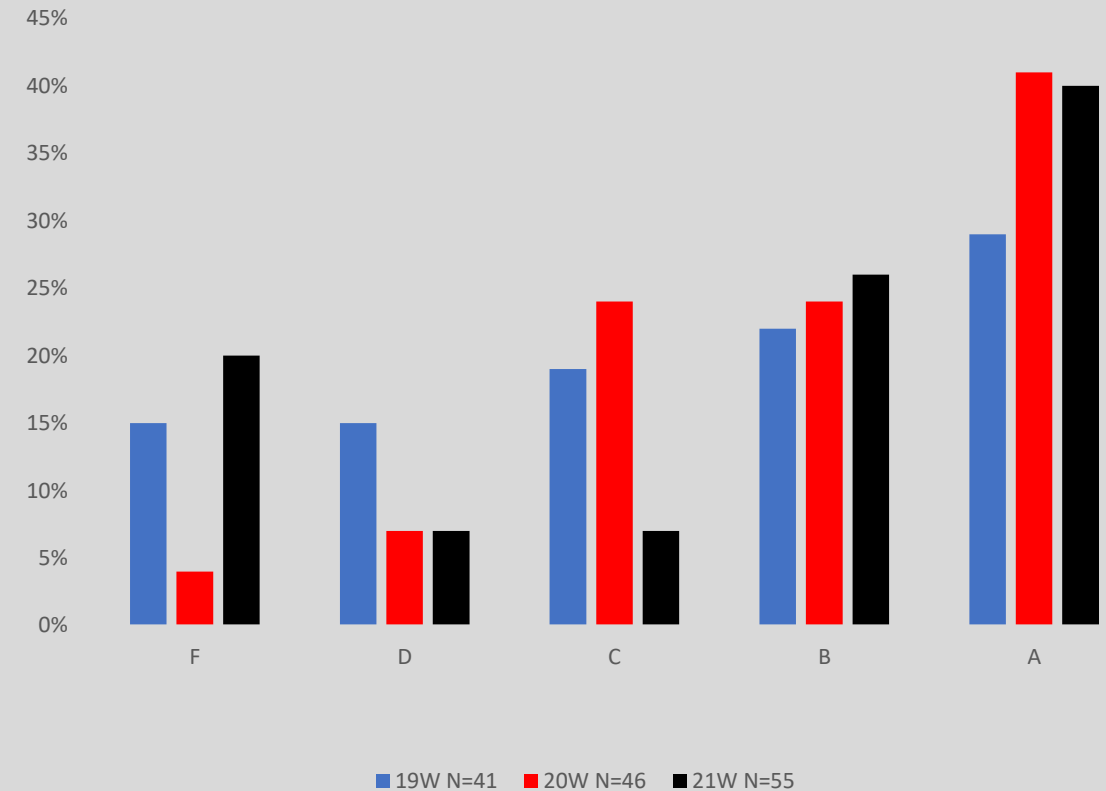
Professor “Gray” W21 Observational Analysis

Professor “Gray” was the professor of record for all terms Winter 2019 in-person, Winter 2020 started in-person, ended online, and Winter 2021 online

21W Online Course Grade and in-Person Test
Grade (2 Math Course) NTotal=55
Sorted by in-person Test score



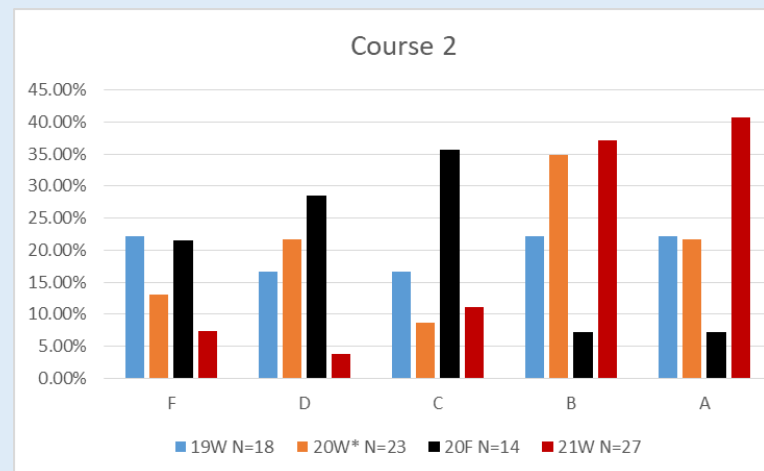
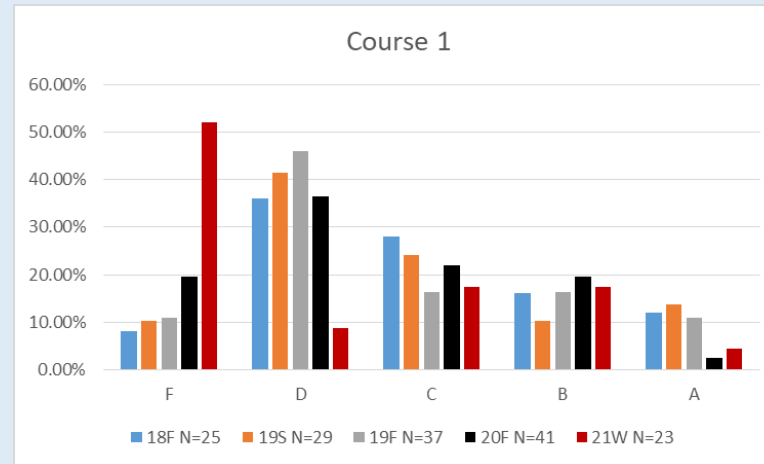
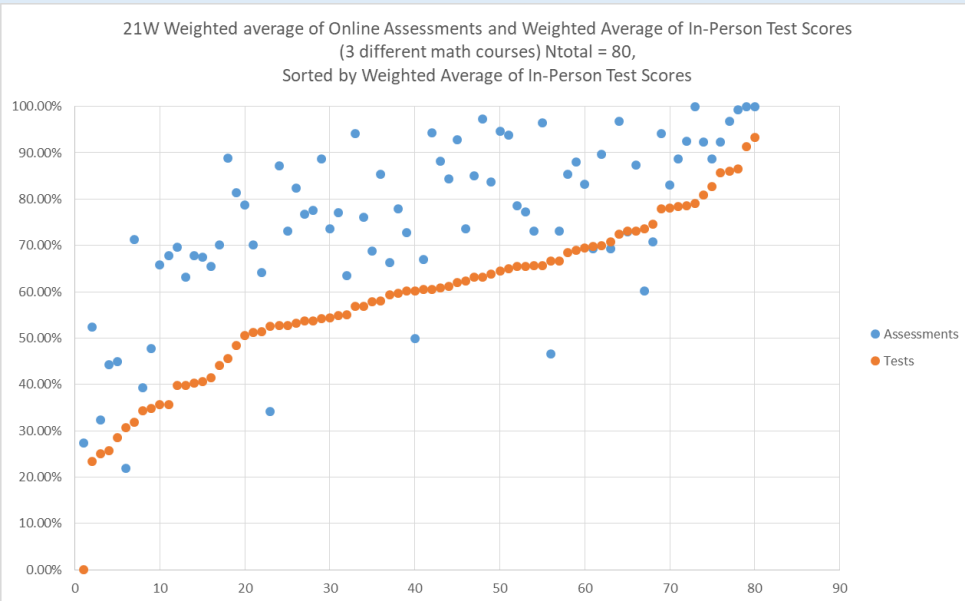
Final Grade Distribution



Professor “Blue” W21 Background

- Three different math courses
 - Mix of levels (Level 1, Level 5 – aka semester 1, semester 5)
 - Mix of diploma/Post-Graduate Certificate programs
- Online Assessments
 - Can be assignments, quizzes, tests (primarily open answer/requirements to show work), in-class activities, anything
 - Unproctored, online
 - All equally weighted (total of 40% or 50% of final grade)
- In-Person Tests
 - Two per course
 - Proctored
 - Two hours, all open answer
 - Face-to-face
 - “Must pass” (50% or higher) on weighted average of the two tests
 - Total of 50% or 60% of final grade
 - Delivered in Weeks 7-10 then Weeks 12-14

Professor “Blue” W21 Observational Analysis



Professor “Blue” was the professor of record for all terms

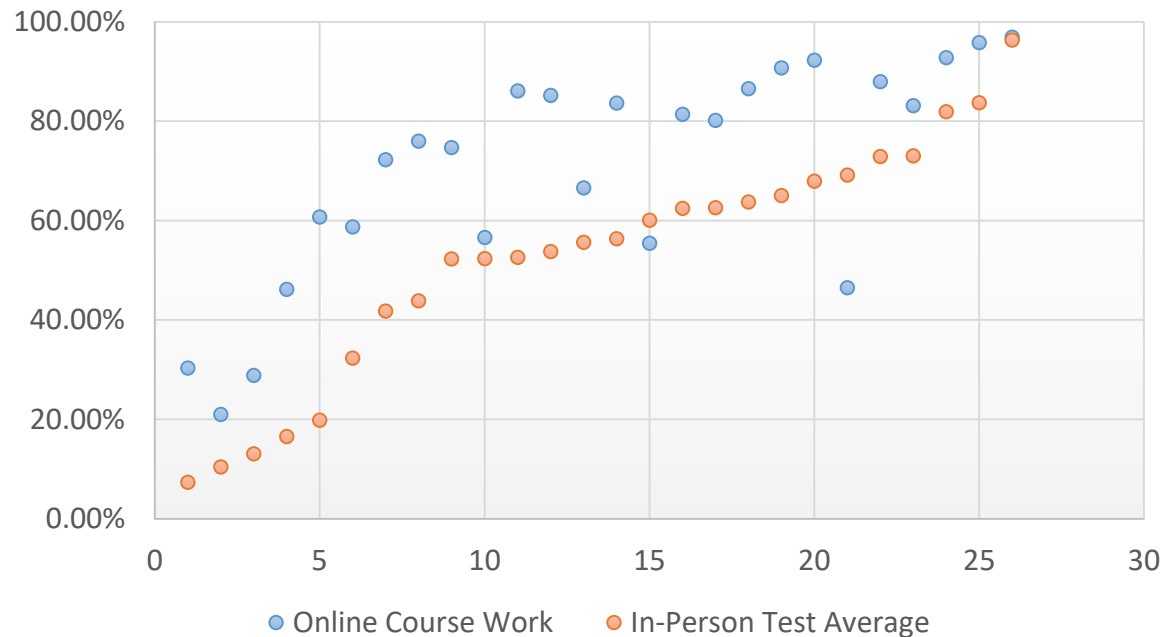
- Fall 2020 and Winter 2021 terms online delivery
- Winter 2020 term started in-person, ended online
- All other terms in-person

Professor “Pink” W21 Observational Analysis

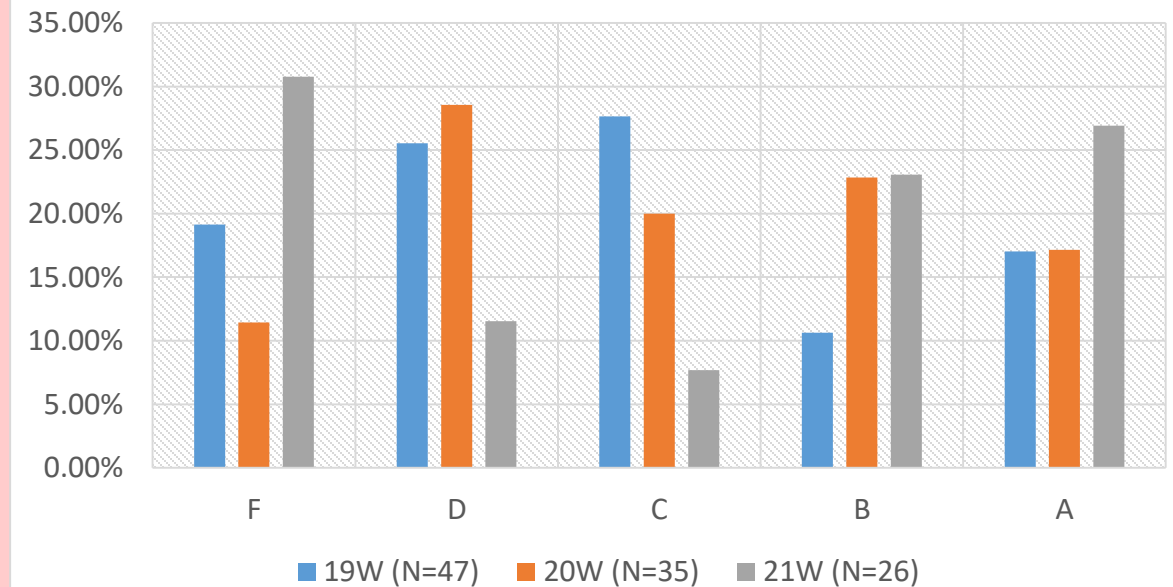
- Two different math courses
 - Level 2 courses (second semester course)
 - Diploma Programs (both technology level)
- Online Assessments
 - Can be assignments, quizzes, in-class activities, anything
 - Unproctored, online
- In-Person Tests
 - Two per course
 - Proctored
 - Three hours, all open answer
 - Face-to-face
 - “Must pass” (50% or higher) on weighted average of the two tests
 - Total of 40% of the final grade
 - Delivered in Weeks 7 then week 14

Professor “Pink” W21 Observational Analysis

21W Online Course Grade and In-Person Test Grade (1 Math Course) NTotal = 26. Sorted by In-Person Test Score



Course 1

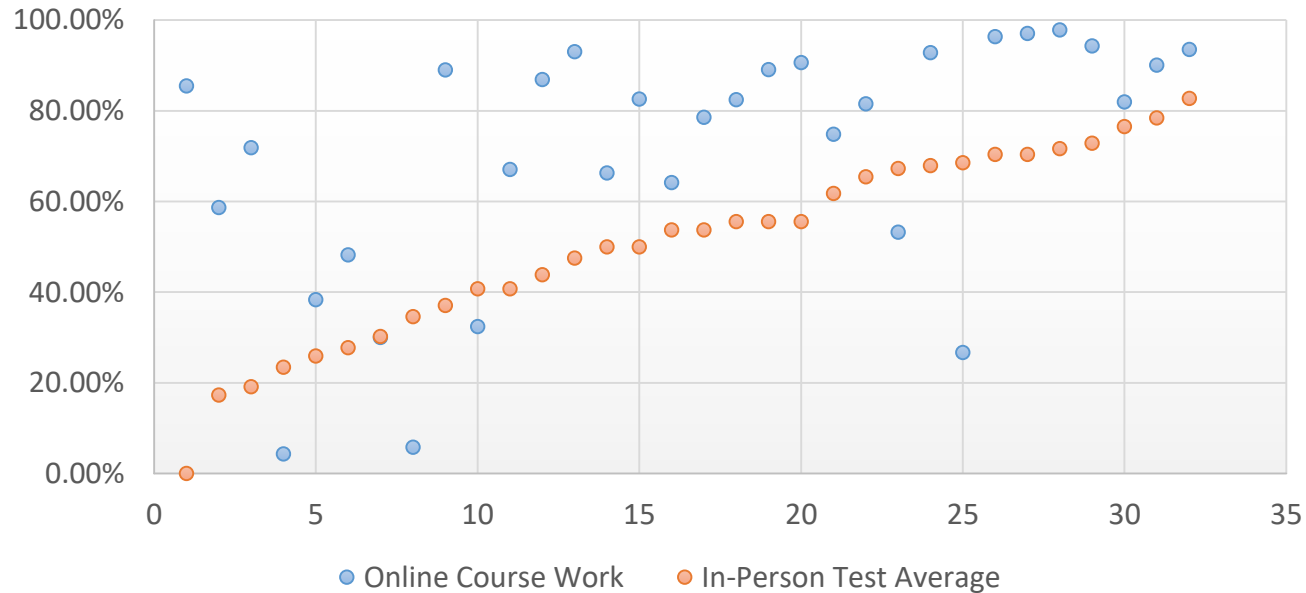


Professor “Pink” was the professor of record for all terms.

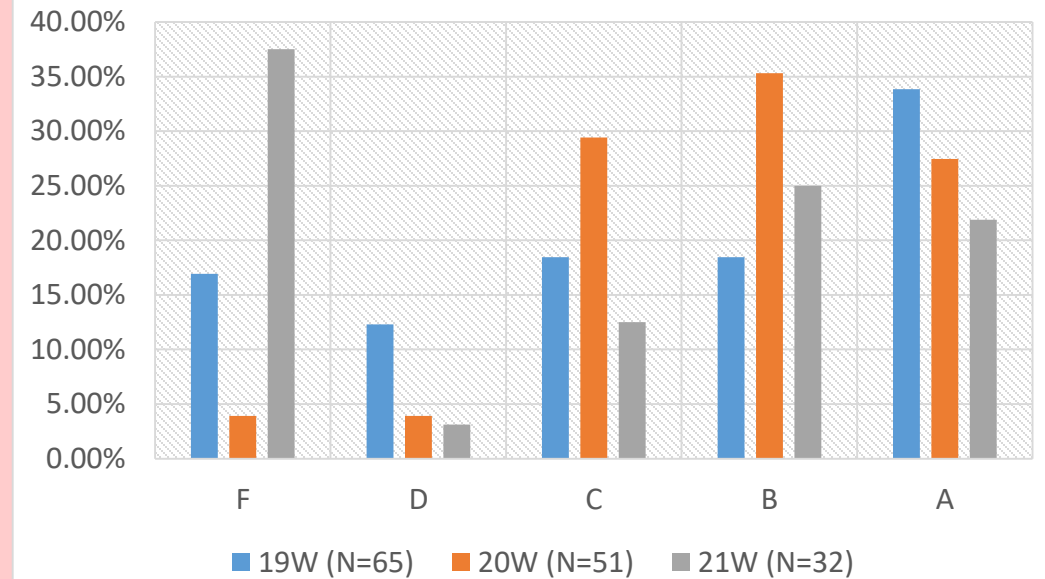
- Winter 21 Fully online
- Winter 20 Started in-person, finished online
- Winter 19 in-person

Professor “Pink” W21 Observational Analysis

21W Online Course Grade and In-Person Test Grade (1 Math Course) NTotal = 32. Sorted by In-Person Test Score



Course 2



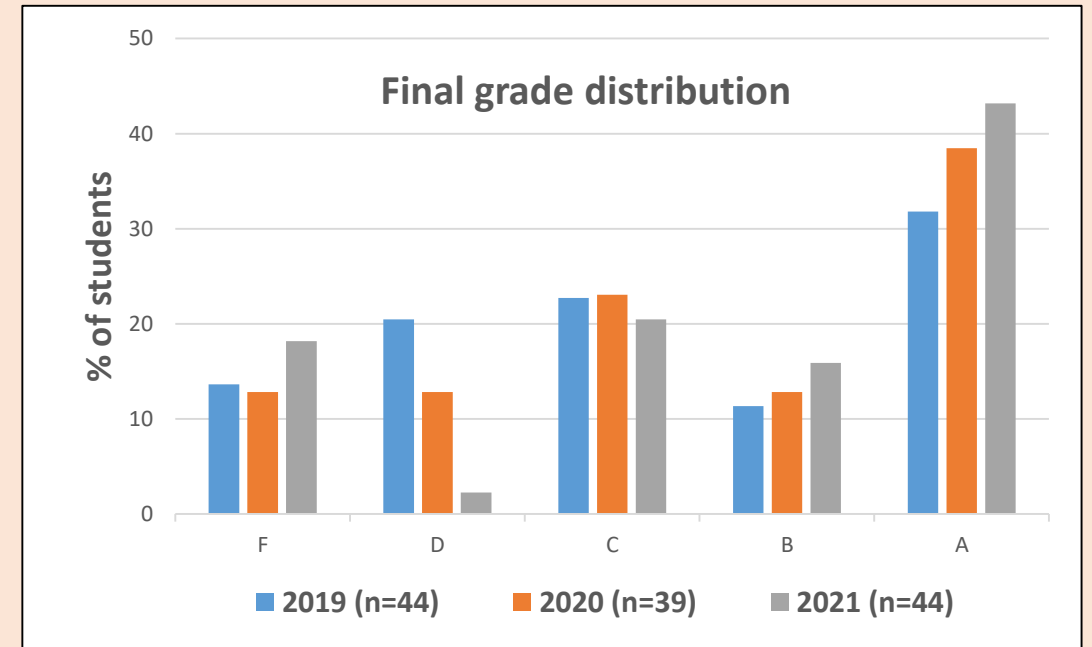
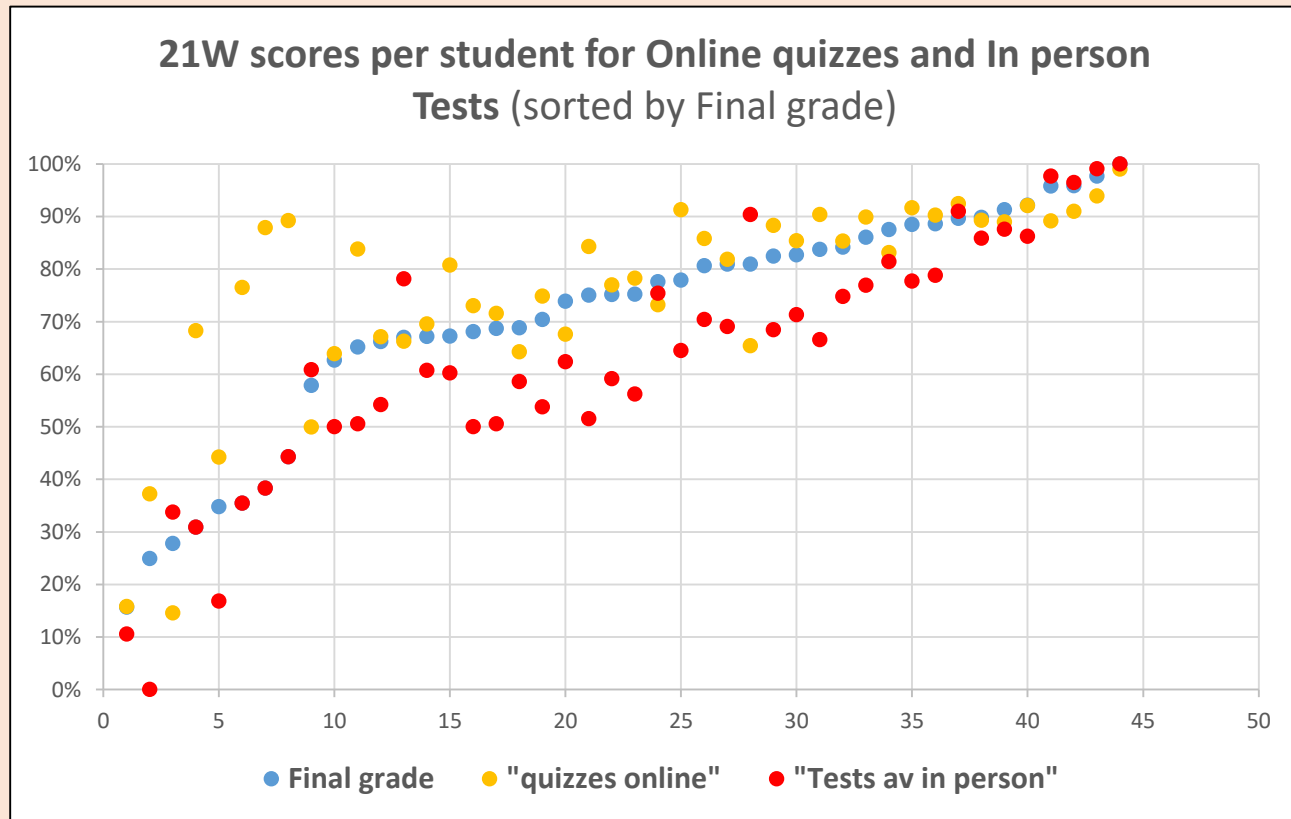
Professor “Pink” or Professor “Blue” was the professor of record for all terms.

- Winter 21 Fully online
- Winter 20 Started in-person, finished online
- Winter 19 in-person

Professor “Orange” W21 Background

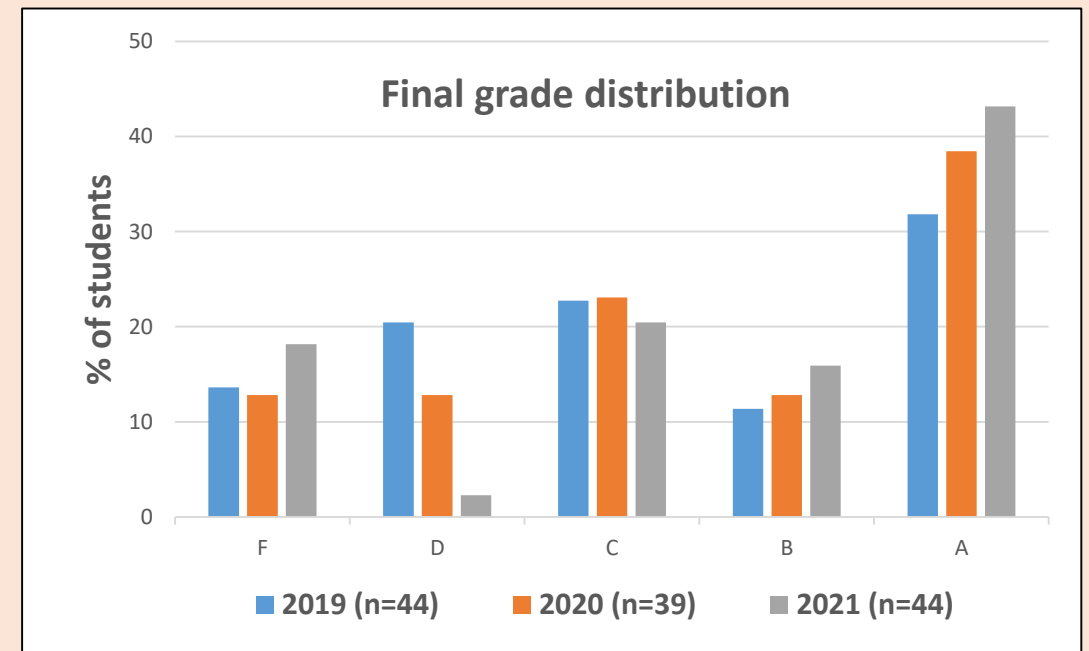
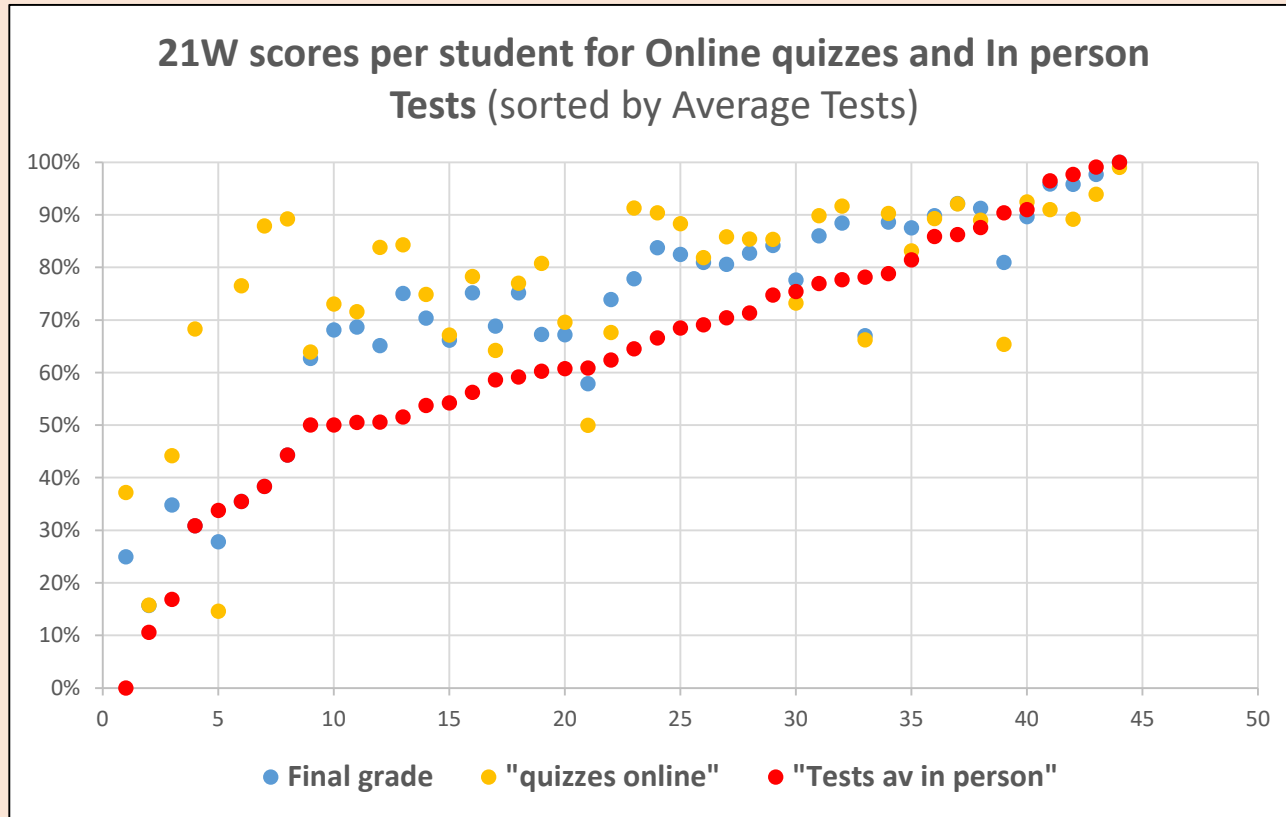
- One math course
 - Level 4 –aka semester 4
 - Diploma program
- Online Assessments
 - Quizzes online (Average of 8) unproctored: 30%
 - Did not include online Assignments (unlimited untimed attempts 30%)
- In-Person Test
 - Two Proctored test (20% each)
 - Three-hours, all open answer
 - Face-to-face
 - “Must pass average tests” (with 50% or higher)
 - Delivered in Week 7 and 14

Professor “Orange” W21 Observational Analysis



Note: Observe the disappearance of D grades in blue dots due to online assessments, to predict students in trouble for Calculus 2.

Professor “Orange” W21 Observational Analysis



Note: Observe the disappearance of D grades in blue dots due to quizzes online, to predict students in trouble for Calculus 2.