

QM Research Study on Student Impact at CSUF, Fall 2017 – Spring 2018 **Dr. Sinjini Mitra, Associate Professor of ISDS Dept. and campus QM co-lead**

Background and Research goals

A research study was conducted in Fall 2017 and Spring 2018 to study the impact of QM certification on student outcomes in online/hybrid courses at California State University, Fullerton (CSUF). In this study, 3 faculty participated from the History and Nursing departments, and their course details are:

1. HIST 180 – taught by Prof. Janssen
2. NURS 470A – taught by Prof. Orr
3. NURS 340 – taught by Prof. Parsons

Of these, HIST 180 participated in Fall 2017 whereas NURS 340 and 470A participated in Spring 2018. All of these online courses have successfully passed QM certification, and currently the certified courses are being taught by the above faculty mentioned above.

The goals of the research study were the following:

- Study whether QM certification of these online courses led to an improvement in student outcomes as measured by grade distribution, course GPAs, and failure rates;
- Study whether there existed significant differences in student outcomes between the QM-certified and non QM-certified versions of the same online courses (or between the QM-certified online course and non QM-certified face-to-face course);
- Study if significant differences occurred in student outcomes once the courses were certified (comparing pre- and post-certification grades for the same course taught by the same instructor)
- Study the effect of QM certification on underrepresented student populations (URMs) as compared to non URM ones
- Study differences in student perceptions about the course design (such as, ease of navigation and access to relevant materials) between the QM-certified and non QM-certified versions of the same online course via a survey
- Study faculty perceptions about QM-certifications in terms of changes in student outcomes, perceptions and their own professional development

Data collection and Methods

Data were collected from these three different courses in a variety of ways – letter grade distributions, DFW rates, and course GPAs were obtained from the QM certified courses, from the other non QM-certified courses (online and face to face) offered in the same semester, and also from earlier semesters when the non QM-certified version of the QM-certified course was last offered and taught by the same instructor. Further, data were collected about the demographic background of the students enrolled in these courses, along with URM information¹. Finally, student perceptions were obtained via a survey, the instrument being developed by CSU CO in alignment with the QM standards (only Likert-type questions), and faculty perceptions about teaching the same course pre- and post-certification and their own professional development as part of the QM experience were collected using a separate survey instrument developed by the researcher (included both Likert-type and explanation-type questions). The entire data collection process was performed with relevant IRB approval from the campus.

The data were analyzed using statistical and data mining tools and summarized using tables.

Results

The results regarding the student outcomes of the 3 different courses are presented separately below while the student survey results are presented in a summary form over all the 3 courses as no identifying

¹ These data were obtained from the CSUF Office of Assessment and Institutional Effectiveness (OAIE).

information were obtained from the students in the survey. The faculty survey data were also analyzed together and results reported in aggregated form.

HIST 180 course

For this course, we considered for our study two sections of the online QM-certified version (referred to as **Group 1**), one section of the online non-QM certified version (**Group 2**), and four sections of the face-to-face non QM-certified sections (**Group 3**) taught in Fall 2017. Further, we considered two sections of the online version taught by the same instructor (Dr. Janssen) prior to QM certification from Summer 2015 (**Group 4**).

Table 1 shows the demographics of students enrolled in these four different groups of courses. The distributions across the different groups demonstrate similar patterns, except that face-to-face classes seemed to enroll a significantly greater proportion of Hispanics, URMs and first generational college students than the corresponding online sections which seemed to have more white and Asian students.

Table 1: Demographics of students enrolled in the different groups of courses under study.

Variable		Group 1 (n = 75)	Group 2 (n = 39)	Group 3 (n = 133)	Group 4 (n = 55)
Sex	Male	35 (46.7%)	15 (38.5%)	61 (45.9%)	25 (45.5%)
	Female	40 (53.3%)	24 (61.5%)	72 (54.1%)	30 (54.5%)
Ethnicity	Amer. Ind.	0	0	1 (0.8%)	0
	Black	0	1 (2.6%)	0	2 (3.6%)
	Hispanic	28 (37.3%)	11 (28.2%)	69 (51.9%)	16 (29.1%)
	Asian	17 (22.7%)	10 (25.6%)	22 (16.5%)	10 (18.2%)
	White	18 (24%)	8 (20.5%)	21 (15.8%)	14 (25.5%)
	International	9 (12%)	5 (12.8%)	8 (6%)	9 (16.4%)
	Pac. Isl.	0	0	0	0
	Multi-ethnic	3 (4%)	3 (7.7%)	5 (3.8%)	1 (1.8%)
Unknown	0	1 (2.6%)	7 (5.3%)	3 (5.5%)	
URM	Yes	28 (37.3%)	12 (30.8%)	70 (52.6%)	18 (32.7%)
	No	47 (62.7%)	27 (69.2%)	63 (47.4%)	37 (67.3%)
First gen.	Yes	24 (32%)	12 (30.8%)	50 (37.6%)	12 (21.8%)
	No	51 (68%)	27 (69.2%)	83 (62.4%)	43 (78.2%)
Pell eligible	Yes	34 (45.3%)	17 (43.6%)	51 (38.3%)	21 (38.2%)
	No	41 (54.7%)	22 (56.4%)	82 (61.7%)	34 (61.8%)

Table 2 shows the grade distributions, repeatable grades and GPAs for the 4 groups. Figures 1 - 2 show these graphically.

Table 2: Grade distributions, repeat. Grades and GPA of the different groups of courses.

Grade	Group 1	Group 2	Group 3	Group 4
A	13 (17.3%)	5 (12.8%)	21 (15.8%)	5 (9.1%)
B	35 (46.7%)	10 (25.6%)	53 (39.8%)	35 (63.6%)

C	14 (18.7%)	9 (23.1%)	40 (30.1%)	6 (10.9%)
CR	0	0	0	1 (1.8%)
D	6 (8%)	1 (2.6%)	5 (3.8%)	1 (1.8%)
F	0	6 (15.4%)	2 (1.5%)	0
I	4 (5.3%)	0	3 (2.3%)	4 (7.3%)
RP	0	1 (2.6%)	0	0
W/WU	3 (4%)	7 (17.9%)	9 (6.8%)	3 (5.5%)
Repeatable grades*	10 (14.5%)	11 (32.4%)	17 (1.4%)	2 (4.3%)
Course GPA (std. dev.)*	2.79 (0.87)	1.97 (1.4)	2.65 (0.85)	2.92 (0.56)

* For repeatable and GPA totals I, W, RP CR are excluded.

Figure 1: Grade distributions (%) for the different groups of courses under study.

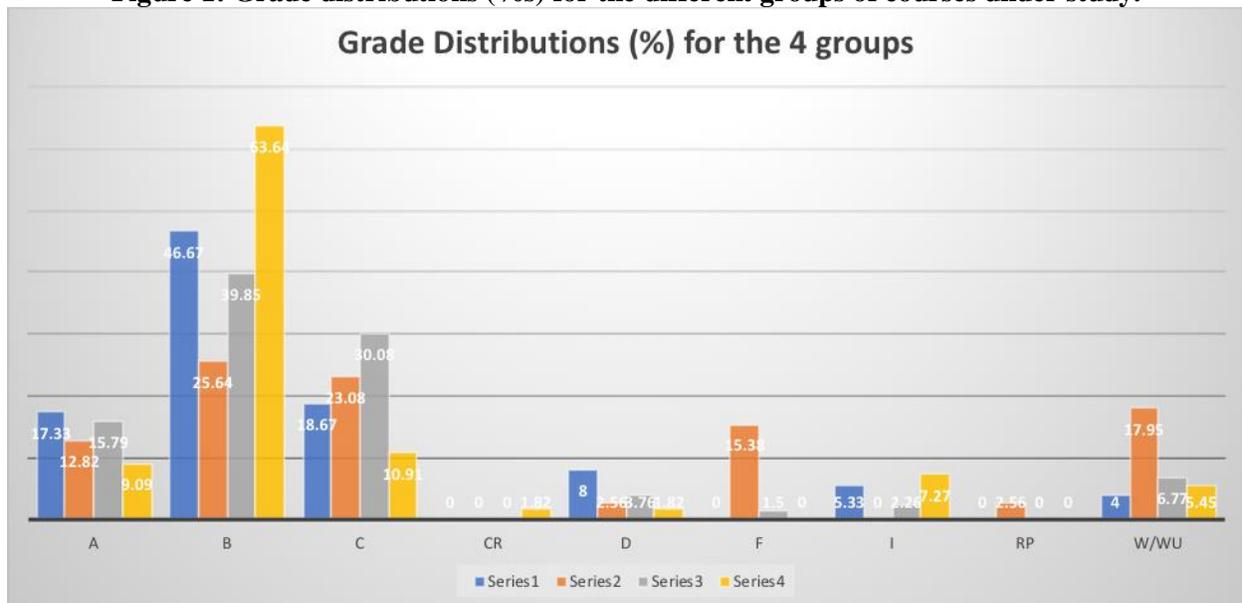
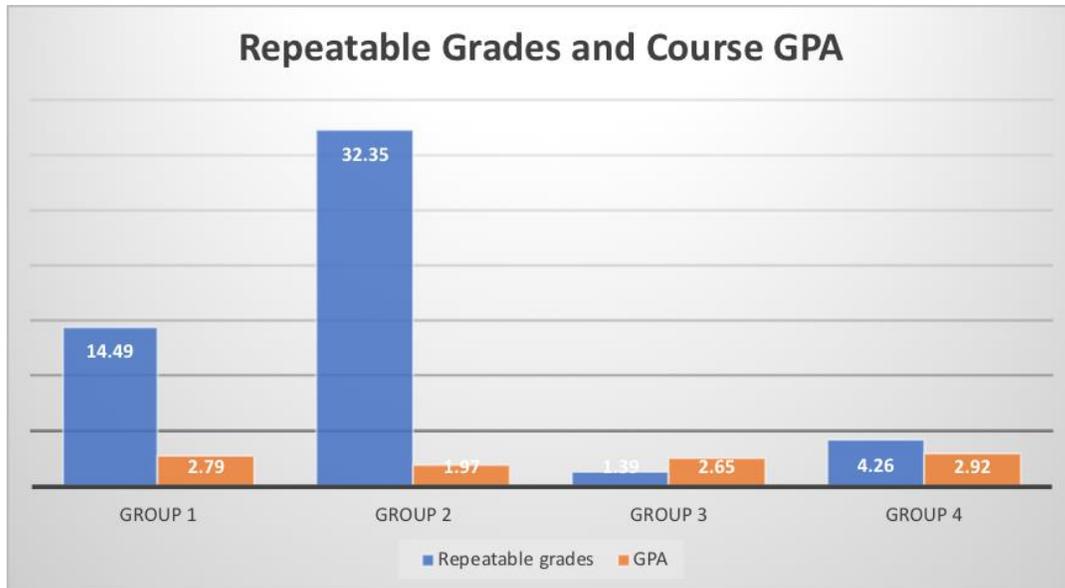


Figure 2: Repeatable grades (%) and GPA for the different groups of courses under study.



A summary of the important observations regarding student outcomes for HIST 180 are outlined below:

1. The non QM-certified online course has the lowest mean course GPA, highest proportion of repeatable grades, highest drop-out rates, and lowest proportions of A and B grades.
2. Mean course GPA is highest for the pre-certified course taught in Summer 2015 followed by the same certified course taught in Fall 2017. Both these GPAs are higher than those from the non QM-certified online course and non QM-certified face-to-face courses taught in Fall 2017.
3. The proportion of A grades is highest for the QM-certified online course in Fall 2017.
4. The proportion of repeatable grades is lowest for the non QM-certified face-to-face course sections.
5. The proportion of repeatable grades for the QM-certified course increased in Fall 2017 after certification compared to the pre-certified course in Summer 2015; similarly, course GPA decreased from Summer 2015 to Fall 2017 post certification. One contributing factor might be that often students in summer are known to be more motivated and perform better than students during the regular academic year.

Table 3 summarizes the student outcomes (repeatable grades and GPAs) of this course for the 4 groups based on URM status. The proportion of URM students earning repeatable grades is highest for the face-to-face sections, while the GPA for URM students is highest for the pre QM-certified course taught in Summer 2015. The GPAs for the QM-certified online and face-to-face classes are the same and significantly higher than the non QM-certified online section for Fall 2017. However, The GPA of the URM students (as is the case with overall) dropped for the online course from Summer 2015 (pre-certification) in Fall 2017 (post-certification) and the proportion of repeatable grades increased.

Table 3: Repeatable Grades and GPAs of URM vs. non-URM students for the different groups of courses.

	Group 1	Group 2	Group 3	Group 4
Repeatable grades				
URM	6 (60%)	4 (36.4%)	12 (70.6%)	0
Non URM	4 (40%)	7 (63.6%)	5 (29.4%)	2 (100%)
Total	10	11	17	2
GPA				
URM	2.51 (0.82)	1.71 (1.53)	2.51 (0.82)	2.91 (0.47)

Non URM	2.94 (0.86)	2.07 (1.30)	2.80 (0.86)	2.92 (0.60)
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NURS 470A course

For this course, we considered for our study three sections of the online QM-certified version (referred to as “Group 1”) and one section of a hybrid non-QM certified version (“Group 2”) taught in Spring 2018. Further, we considered three sections of the online version taught by the same instructor (Prof. Orr) prior to QM certification from Fall 2015 (“Group 3”).

Table 4 shows the demographics of students enrolled in these three different groups of courses. The distributions across the different groups demonstrate similar patterns, except that face-to-face classes enrolled a significantly greater proportion of Asians, while a higher proportion of URMs enrolled in the online sections.

Table 4: Demographics of students enrolled in the different groups of courses under study.

Variable		Group 1 (<i>n</i> = 79)	Group 2 (<i>n</i> = 14)	Group 3 (<i>n</i> = 66)
Sex	Male	9 (11.4%)	1 (7.1%)	8 (12.1%)
	Female	70 (88.6%)	13 (92.9%)	58 (87.9%)
Ethnicity	Amer. Ind.	0	0	0
	Black	3 (3.8%)	0	3 (4.5%)
	Hispanic	32 (40.5%)	2 (14.3%)	20 (30.3%)
	Asian	23 (29.1%)	7 (50%)	21 (31.8%)
	White	15 (19%)	1 (7.1%)	12 (18.2%)
	International	1 (1.3%)	4 (28.6%)	1 (1.5%)
	Pac. Isl.	0	0	0
	Multi-ethnic	2 (2.5%)	0	1 (1.5%)
	Unknown	3 (3.8%)	0	8 (21.1%)
URM	Yes	35 (44.3%)	2 (14.3%)	23 (34.8%)
	No	44 (55.7%)	12 (85.7%)	43 (65.2%)
First gen.	Yes	19 (24.1%)	4 (28.6%)	28 (42.4%)
	No	60 (75.9%)	10 (71.4%)	38 (57.6%)
Pell eligible	Yes	23 (29.1%)	2 (14.3%)	32 (48.5%)
	No	56 (70.9%)	12 (85.7%)	34 (51.5%)

Table 5 shows the grade distributions, repeatable grades and GPAs for the 3 groups. Figures 3 - 4 show these graphically. A summary of the important observations regarding student outcomes for NURS 470A are outlined below:

1. The non QM-certified hybrid course has the lowest mean course GPA, highest proportion of repeatable grades, and lowest proportions of A grades.
2. Mean course GPA is similar for the QM certified course in Spring 2018 and for the same pre-certified course taught in Fall 2015, both of which are significantly higher than that for the non QM-certified hybrid course taught in Spring 2018.
3. The grade distributions are very similar across the QM-certified course and its pre-certified version, with higher proportion of A grades, lower proportion of B grades than the non QM-certified hybrid course.

4. The proportion of repeatable grades is lowest for the QM-certified online course section (Spring 2018). It is slightly lower than that of the non-certified version (Fall 2015) and significantly lower than that of the non-certified hybrid course (Spring 2018).

Table 5: Grade distributions, repeat. Grades and GPA of the different groups of courses.

Grade	Group 1	Group 2	Group 3
A	46 (58.2%)	5 (35.7%)	38 (57.6%)
B	23 (29.1%)	6 (42.9%)	18 (27.3%)
C	6 (7.6%)	1 (7.1%)	8 (12.1%)
D	0	1 (7.1%)	0
F	0	1 (7.1%)	1 (1.5%)
W/WU	4 (5.1%)	0	1 (6.5%)
Repeatable grades*	1 (1.3%)	2 (14.3%)	2 (3%)
Course GPA (std. dev.)*	3.32 (0.96)	3.01 (1.17)	3.31 (0.86)

* For repeatable and GPA totals W/WU are excluded.

Figure 3: Grade distributions (%s) for the different groups of courses under study.

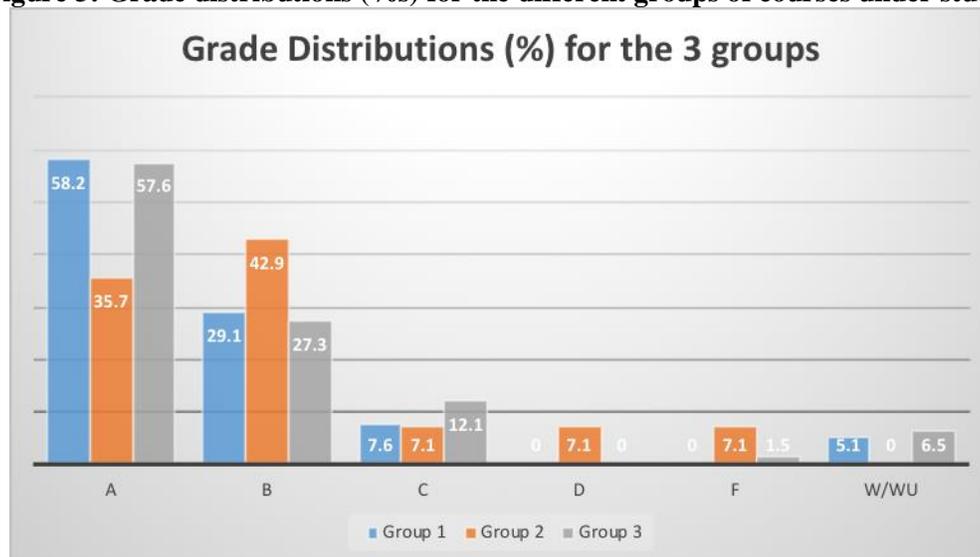


Figure 4: Repeatable grades (%) and GPA for the different groups of courses under study.

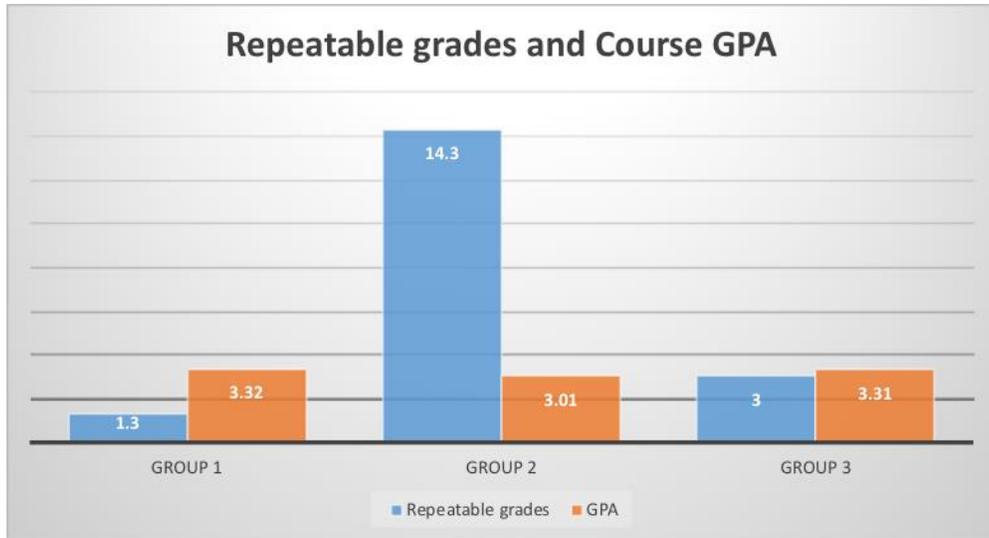


Table 6 summarizes the student outcomes (repeatable grades and GPAs) of this course for the 3 groups based on URM status. The proportion of URM students earning repeatable grades and GPA for URM students are both very similar across all the groups, that for the non QM-certified hybrid section being slightly lower.

Table 6: Repeatable Grades and GPAs of URM vs. non-URM students for the different groups of courses.

	Group 1	Group 2	Group 3
Repeatable grades			
URM	0	0	1 (50%)
Non URM	1 (100%)	2 (100%)	1 (50%)
Total	1	2	2
GPA			
URM	3.43 (1.03)	3.30 (-)	3.38 (0.66)
Non URM	3.30 (0.92)	2.97 (1.27)	3.26 (0.95)

NURS 340 course

For this course, we considered for our study two sections of the online QM-certified version (referred to as “Group 1”) and one section of the same course taught by the same instructor (Prof. Parsons) prior to QM certification from Fall 2015 (“Group 2”).

Table 7 shows the demographics of students enrolled in these two different groups of courses. The distributions across the different groups demonstrate similar patterns, except that the Spring 2018 courses were dominated by Hispanic students whereas the Fall 2015 course had a higher proportion of Asian students followed by Hispanic students.

Table 7: Demographics of students enrolled in the different groups of courses under study.

Variable		Group 1 (n = 62)	Group 2 (n = 23)
Sex	Male	8 (12.9%)	6 (26.1%)
	Female	54 (87.1%)	17 (73.9%)

Ethnicity	Amer. Ind.	0	0
	Black	1 (1.6%)	0
	Hispanic	27 (43.5%)	6 (26.1%)
	Asian	9 (14.5%)	8 (34.8%)
	White	16 (25.8%)	4 (17.4%)
	International	0	2 (8.7%)
	Pac. Isl.	0	0
	Multi-ethnic	4 (6.5%)	3 (13%)
	Unknown	5 (8.1%)	0
URM	Yes	28 (45.2%)	6 (26.1%)
	No	34 (54.8%)	17 (73.9%)
First gen.	Yes	15 (24.2%)	7 (30.4%)
	No	47 (75.8%)	16 (69.6%)
Pell eligible	Yes	7 (11.3%)	9 (39.1%)
	No	55 (88.7%)	14 (60.9%)

Table 8 shows the grade distributions, repeatable grades and GPAs for the 2 groups. A summary of the important observations regarding student outcomes for NURS 340 are outlined below:

1. The proportion of A and B grades for the online course, both pre and post certification, are very similar.
2. Proportion of repeatable grades is lower for the Fall 2015 course (actually 0% as compared to 3.2% in Spring 2018) and the mean course GPA is higher also in the Fall 2015 course.

Table 8: Grade distributions, repeat. Grades and GPA of the different groups of courses.

Grade	Group 1	Group 2
A	27 (43.5%)	11 (47.8%)
B	24 (38.7%)	10 (43.5%)
C	7 (11.3%)	2 (8.7%)
D	1 (1.6%)	0
F	1 (1.6%)	0
W/WU	2 (3.2%)	0
Repeatable grades*	2 (3.2%)	0 (0%)
Course GPA (std. dev.)*	3.10 (0.97)	3.37 (0.47)

* For repeatable and GPA totals W/WU are excluded.

Table 9 summarizes the student outcomes (repeatable grades and GPAs) of this course for the 2 groups based on URM status. The proportion of URM students earning repeatable grades and GPA for URM students are significantly better in the Fall 2015 courses (p-re-certification) than in the Spring 2018 courses (post certification).

Table 9: Repeatable Grades and GPAs of URM vs. non-URM students for the different groups of courses.

	Group 1	Group 2
Repeatable grades		
URM	1 (50%)	0

Non URM	1 (50%)	0
Total	2	0
GPA		
URM	2.93 (1.11)	3.45 (0.61)
Non URM	3.25 (0.82)	3.34 (0.42)

Student Survey Data: QM-certified courses

A survey was administered to students in QM-certified online courses at CSUF in order to assess how this certification may have improved the course design from a student’s perspective. The survey instrument was developed by the CSU Chancellor’s Office, and was derived from the 21 Essential Elements of the Quality Matters (QM) Rubric and maps to the 24 Core Elements of the CSU Quality Online Learning and Teaching instrument (QOLT). The survey included 26 items for students to rate and reflect upon their course experience in the following 8 categories using a 6 point Likert scale (1: Strongly Disagree; 2: Disagree; 3: Somewhat Disagree; 4: Somewhat Agree; 5: Agree; 6: Strongly Agree):

- Course Overview and Introduction (4 items)
- Assessment of Student Learning (5 items)
- Instructional Materials and Resources Utilized (3 items)
- Student Interaction and Community (3 items)
- Facilitation and Instruction (2 items)
- Technology for Teaching and Learning (2 items)
- Learner Support and Resources (2 items)
- Accessibility and Universal Design (5 items)

We received 22 responses to the survey from students enrolled in the three QM-certified courses in Fall 2017 and Spring 2018 (14 from HIST 180, 8 from NURS 470A and none from NURS 340), and the results for each category are summarized below.

Categories	Mean score	Std. deviation
Course Overview and Introduction	5.500	0.148
Assessment of Student Learning	5.314	0.129
Instructional Materials and Resources Utilized	5.508	0.099
Student Interaction and Community	5.492	0.275
Facilitation and Instruction	4.952	0.135
Technology for Teaching and Learning	5.357	0.034
Learner Support and Resources	5.429	0.011
Accessibility and Universal Design	5.486	0.189

We observe that the highest mean score is for the category “Instructional materials and resources utilized” and the lowest is for the category “Facilitation and Instruction”, although all the scores are close and generally high (showing high rate of satisfaction among students taking these QM-certified courses for all the item categories). Standard deviations are also low, thus demonstrating sufficient consistency in the student ratings in the different item categories. The largest variation is noticed for the category “Student interaction and community”, and smallest for the category “Learner support and resources”.

Means and variations of ratings for each individual item (total: 26) under the 8 categories (Maximum: 6, Minimum: 1):

Categories	Item #	Mean	Std. deviation
Course Overview and Introduction	1	5.524	0.680
	2	5.286	1.146
	3	5.619	0.590
	4	5.571	0.676
Assessment of Student Learning	1	5.476	0.928
	2	5.333	1.017
	3	5.238	1.411
	4	5.143	1.424
	5	5.381	0.973
Instructional Materials and Resources Utilized	1	5.429	0.746
	2	5.619	0.669
	3	5.476	0.680
Student Interaction and Community	1	5.810	0.512
	2	5.333	0.658
	3	5.333	0.730
Facilitation and Instruction	1	5.048	1.284
	2	4.857	1.236
Technology for Teaching and Learning	1	5.333	0.796
	2	5.381	0.865
Learner Support and Resources	1	5.429	0.811
	2	5.429	0.870
Accessibility and Universal Design	1	5.429	0.811
	2	5.619	0.669
	3	5.190	1.250
	4	5.667	0.577
	5	5.524	0.750

Student Survey Data: Non QM-certified courses

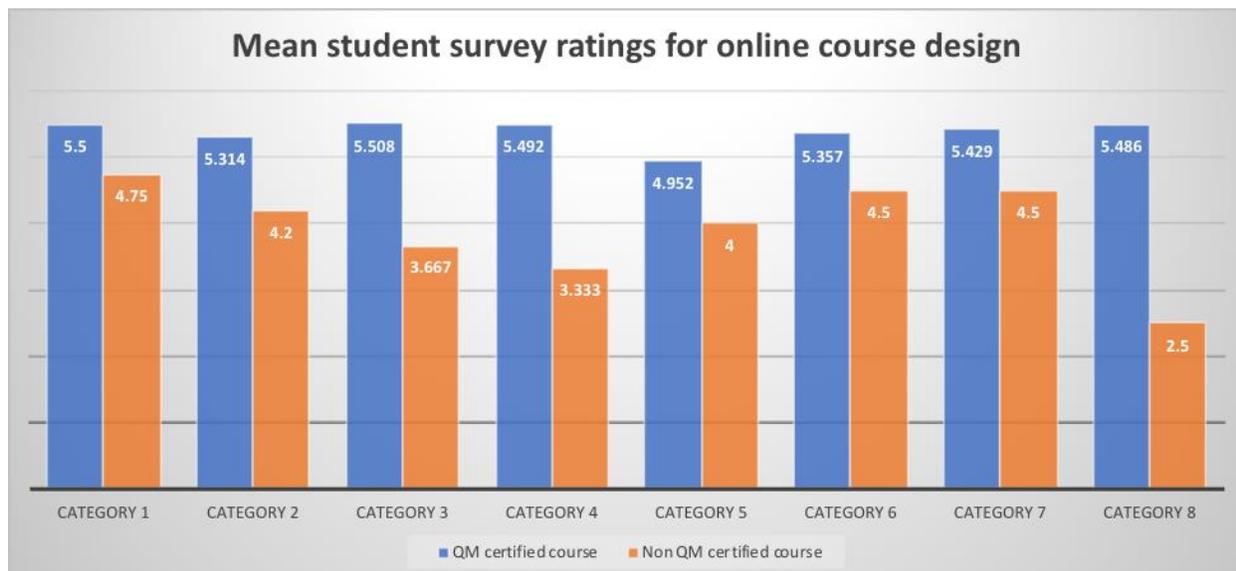
The same 26-item survey instrument was also administered to students who were enrolled in non QM-certified sections of the same course that also has certified sections. This was done to compare student perceptions about the course design between certified and non-certified sections. Only 1 response was obtained across the 3 different courses (from HIST 180), and the results are shown below (note that mean refers to the actual rating here and standard deviations cannot be computed):

Categories	Mean score
Course Overview and Introduction	4.750
Assessment of Student Learning	4.200
Instructional Materials and Resources Utilized	3.667
Student Interaction and Community	3.333
Facilitation and Instruction	4.000
Technology for Teaching and Learning	4.500
Learner Support and Resources	4.500
Accessibility and Universal Design	2.500

The highest score is obtained for the category “Course overview and introduction” and lowest for the category “Accessibility and universal design”.

The bar graph below visually compares the mean ratings between the certified and non-certified versions. As can be clearly seen, the QM-certified courses were perceived to have a better design than the non QM-certified courses for all the 8 categories included in the survey by students. The most significant

difference was indicated for the category “Accessibility and universal design”, followed by “Student interaction and community”.



Faculty Survey Data: QM-certified courses

All the 3 faculty members teaching the QM-certified courses in Fall 2017 and Spring 2018 completed a faculty survey that consisted of quantitative, qualitative questions, and Likert-scale type questions. The survey instrument was developed by the researcher (Dr. Mitra) and it asked faculty about their experience teaching the QM certified course compared to the non-certified course prior to certification, their general perceptions about the changes that occurred as a result of certification (that includes student feedback and course outcomes), the level of their professional development achieved as a result of QM training and the process of certification, and background information including demographics and teaching experience. I will summarize the survey results for each of these different categories.

Experience teaching the certified and non-certified versions of the course

Two of the courses got QM certified in Fall 2015 and one in Fall 2016 (the APPQMR trainings were completed between Summer 2014 – Summer 2016). All of these certified courses have been taught for a few semesters (average = 6). Prior to certification, the courses had been taught for 3 – 6 semesters by the faculty (average = 4). When asked about their level of confidence and satisfaction teaching the courses prior to certification, 2 out of 3 (66.67%) mentioned “very low” and one mentioned “low” (33.33%). As to what the challenges faculty faced in their online courses prior to certification, the main issue pointed out was that of defining measurable learning objectives and aligning course-level and module-level objectives. Some others mentioned were identifying course activities and embedding videos with captioning. The main reasons behind getting their courses certified were improving their course delivery for student success, professional development and to develop confidence in the course (stipends also provided the necessary incentive in some cases).

All of the 3 faculty members reported that their confidence and satisfaction in their online course delivery increased a great deal after getting their course certified. They all stated that the certification made their course more rigorous, improved navigation for students, helped improve the evaluation rubrics and above all met professional standards.

Improvement of student perceptions and course outcomes

All 3 faculty members said that they definitely believe that student perceptions about the course improved post-certification. Specifically, they mentioned that students feel connected in the course, find it easy to navigate (especially, while getting started), and also find the video captions helpful.

Professional development

Generally, all the faculty members mentioned that entire QM process (APPQMR training and certification) contributed to their overall professional development. Particularly, they mentioned the process provided opportunities for networking and understanding of curriculum development better for providing input at the department level about online pedagogy. One faculty member said “**It has been the most impactful experience of my teaching career.**” All of them very strongly believed that QM certification significantly improved the overall quality of their respective online courses and increased their confidence in teaching those courses.

Faculty Background

Teaching experience summary:

Teaching experience	Summary statistics
College-level teaching	Mean = 12.33 years, sd. = 4.73 years
CSUF teaching	Mean = 10.67 years, sd. = 5.13 years
Online teaching	4.5 years, sd. = 3.04 years

Basic demographic summary:

Demographic variable	Frequencies
Dept./College	
HHD (Nursing)	2
HSS (History)	1
Gender	
Male	1
Female	2
Age group	
40 – 50 years	1
Over 50 years	2
Race/Ethnicity	
White	3

Overall conclusions

This study yielded important insights into the advantages of QM training and certification on online courses at CSUF. We observed some differences in performance of students between certified sections and corresponding non-certified face-to-face, online and hybrid sections; course GPA was higher and a lower proportion of repeatable grades was observed for the certified sections in most cases. There was however no difference in terms of student performance in the same pre and post certification; in fact, in some cases performance was a little poorer after certification and this may be attributed to the more rigorous nature of the certified version of the course (as perceived by both students and faculty).

Student perceptions regarding the online course design were significantly better for the QM-certified courses in all the categories that were considered. Similarly, faculty who underwent QM training and the certification process reported a great experience in terms of their professional development as well as an increase in their satisfaction and confidence teaching the course after QM certification.

Reflections and Future work

The study was very timely as the number of online course offerings increase on campus and it becomes more necessary than ever to ensure their quality so that students have a good experience that in turn improves their performance. We conducted this study with only 3 courses although the initially the plan was to include 10 courses. However, some faculty were not available to participate despite incentives being provided by the researcher. In the future, we plan to expand this study further by including more courses from different disciplines and also by a more in-depth analysis of the impact of QM training and certification on different subgroups of students defined by their background factors.