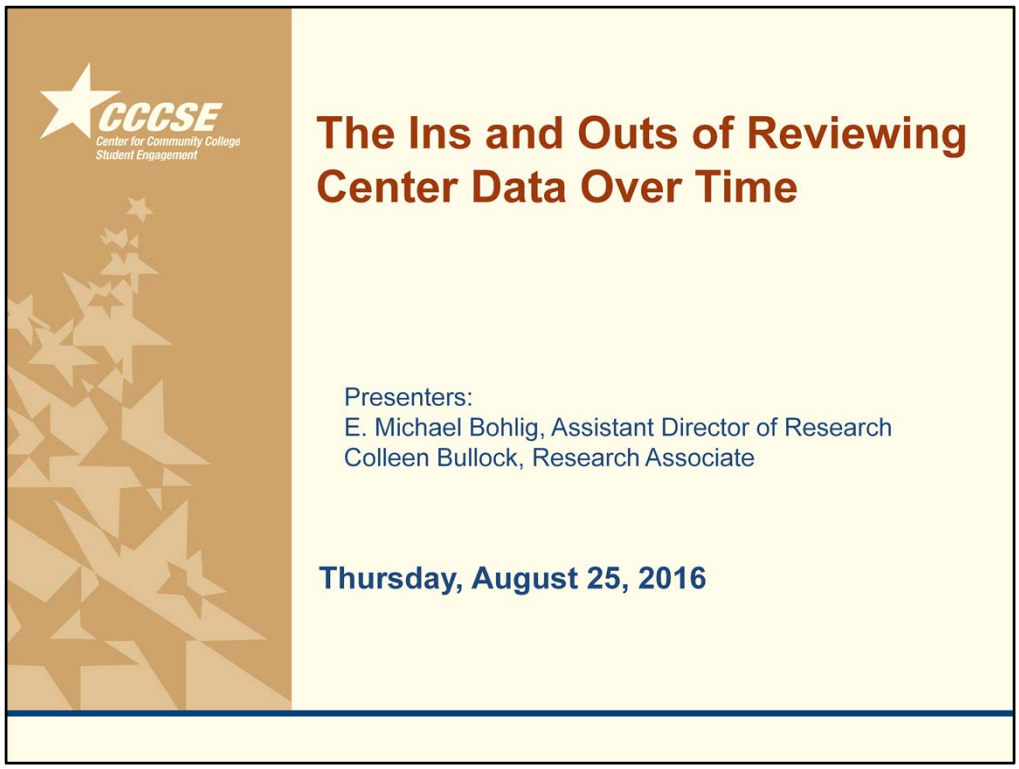
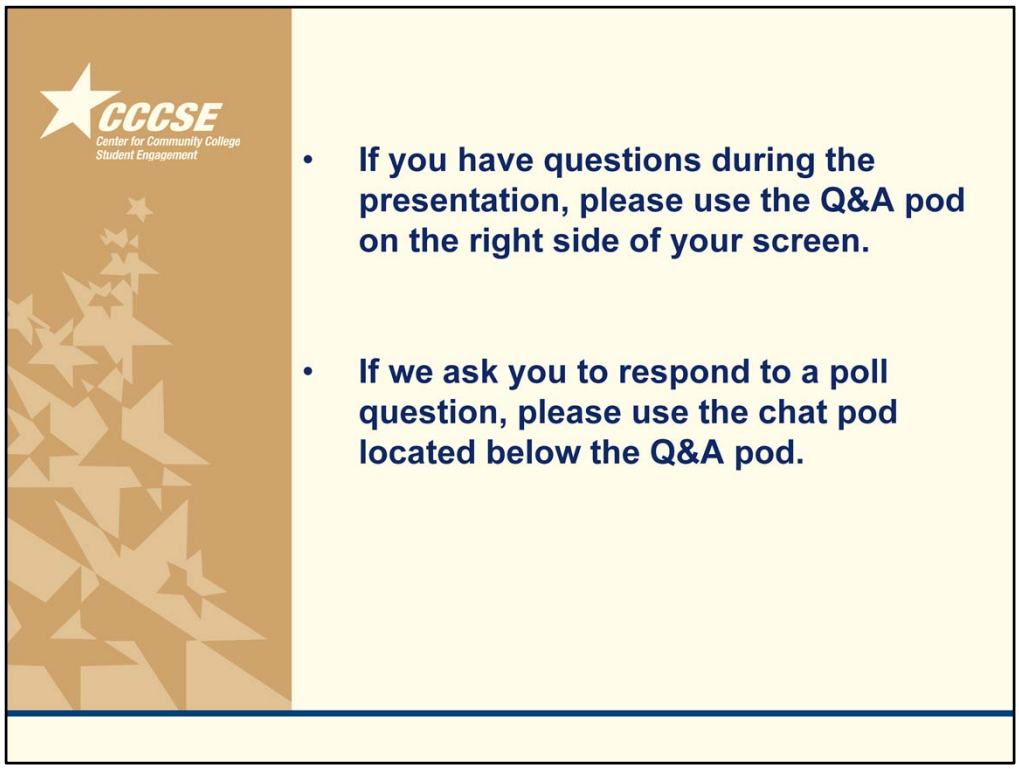


Good afternoon and welcome to the Center's webinar on analyzing *CCSSE* and *SENSE* data over time. I am Mike Bohlig, the Assistant Director of Research and I am joined by my colleague Colleen Bullock, a Research Associate here at the Center.

Our Colleagues Courtney Adkins, Kyle Lovseth, Katie Mitchell, and Emilio Delboy will be monitoring the Q&A pod for questions during the webinar.



Colleen and I will try to answer questions throughout the webinar. However, if we don't get to them all, we will have a Q&A at the end and will respond to any questions we are not able to answer during the presentation. The webinar is scheduled for one hour, but Colleen and I will remain available to answer questions as long as you continue to submit them. If you think of questions after the webinar, Colleen's and my contact information will be on the last slide or you can find our contact information on the Center's contact page.

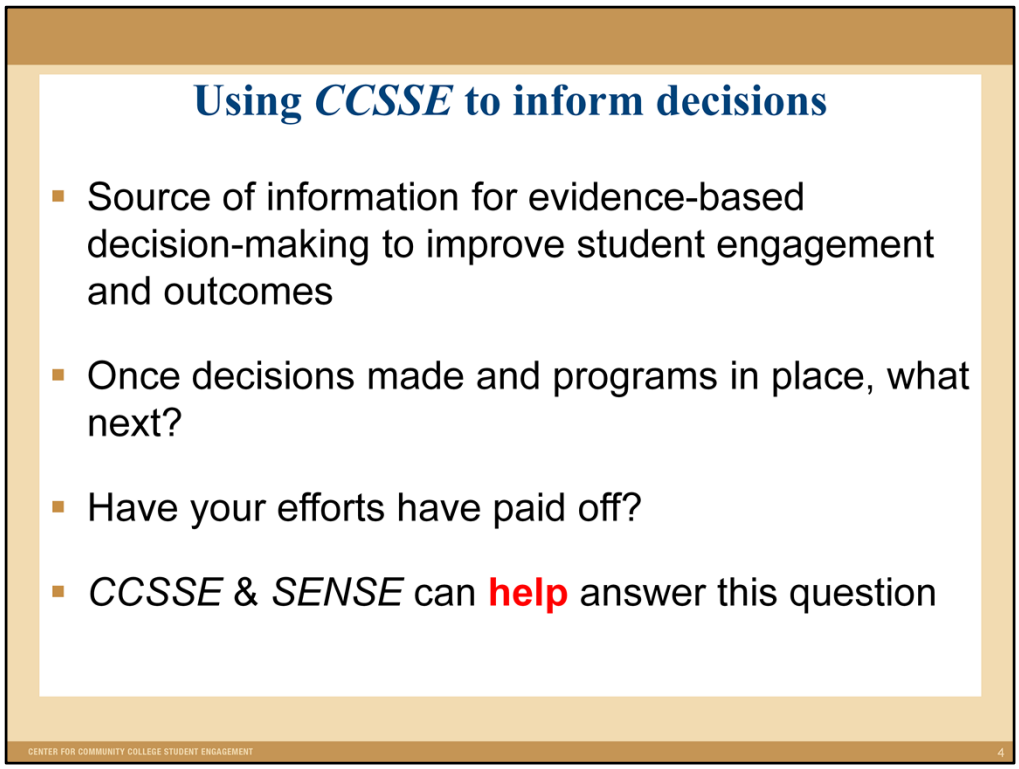
We will start with a brief note on how *CCSSE* and *SENSE* data fit into an evaluation process and go over some survey mechanics.

Next, we'll take a few minutes to discuss a few important aspects of measuring change over time.

Then we will move to the main focus of todays webinar: Analyzing *CCSSE* and *SENSE* data over time.

> *NOTE: Today's presentation focuses on examples from CCSSE, but the general process is also applicable to SENSE.*

Finally, we will note a couple of cautions when using *CCSSE* and *SENSE* data for analysis over time.

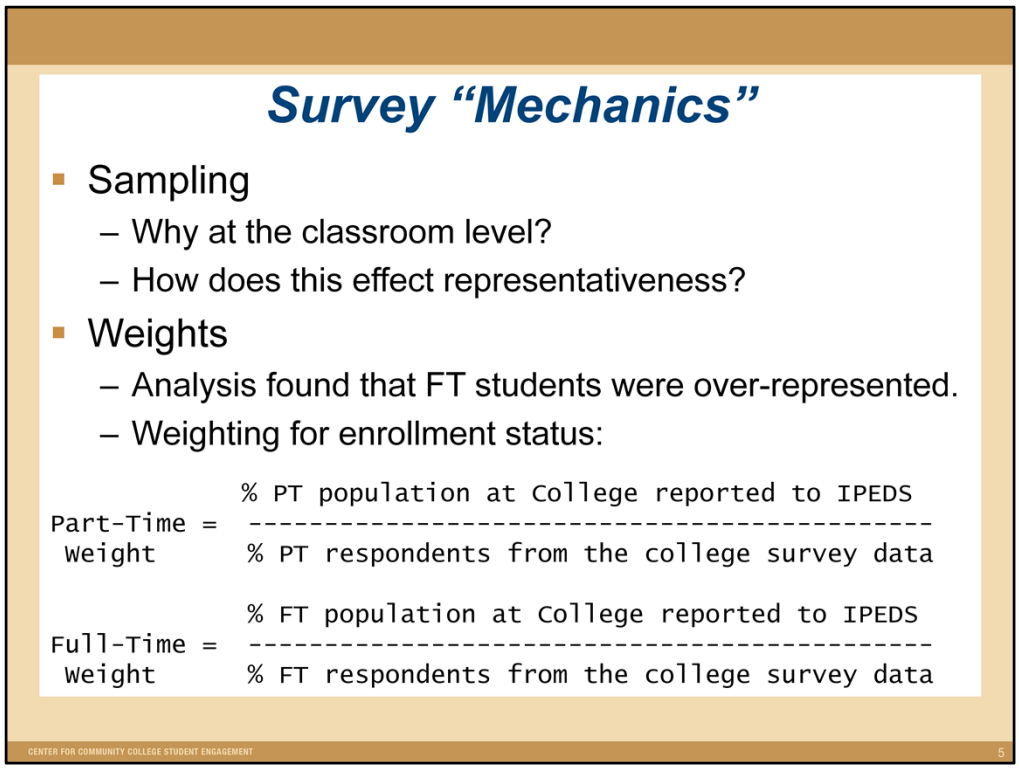


For 12 years now, colleges have been using Center survey data to inform their evidence-based decision-making process to improve student outcomes.

You have analyzed your data, developed interventions, and implemented them.

Your college has administered the survey several times now and you want to learn more from your data – Specifically, have your efforts paid off?

We have developed this webinar to help you get the most out of your Center survey data and address this question. We emphasize the word "help" on this slide because, as with any evaluation, multiple data sources should be used to determine success.

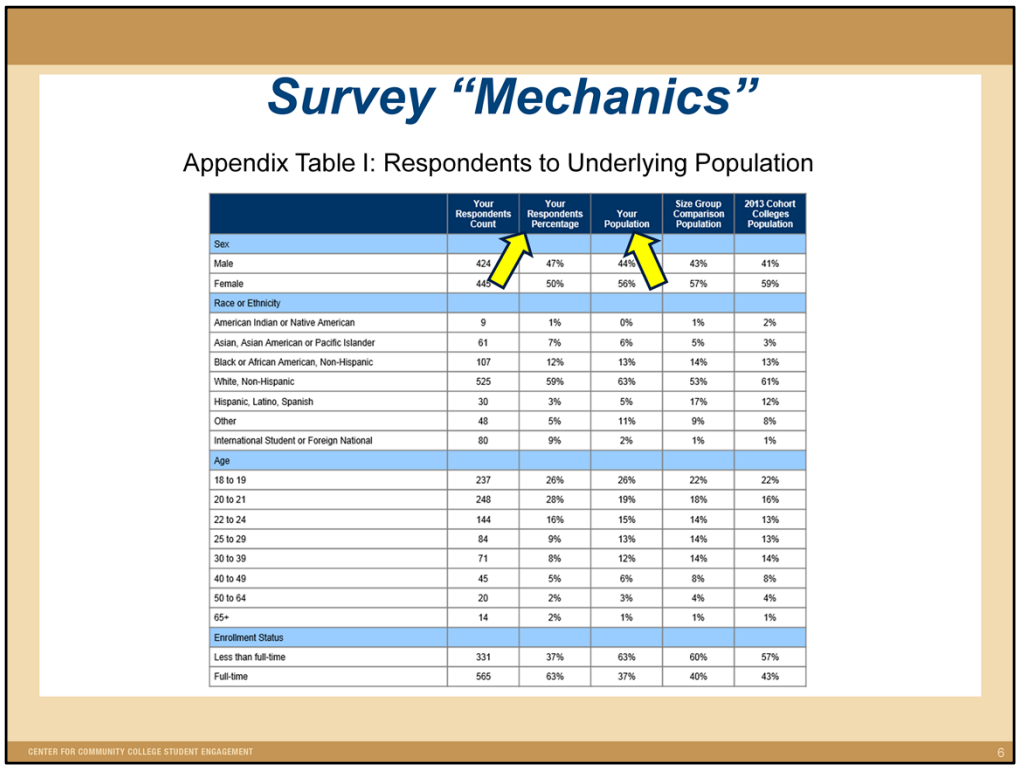


When the Center began designing the survey and the survey process, the intent was to randomly sample individual students. However, upon investigation and in consultation with college presidents and others in the CC field, it was determined that the most effective way to sample and administer the survey was at the classroom level.

To be informative and meaningful, survey data must be collected from enough respondents for the results to be representative of the population. Knowing that some students refuse to complete the survey and some faculty refuse to give up instruction time for the survey to be administered in their classes, the Center provides samples that are 160% of target for *CCSSE* and 200% of target for *SENSE*. Some colleges wish to look at results by departments or divisions. While oversampling can help achieve this, there are limitations to how these data can be interpreted, which we will discuss at the end of the presentation.

Classroom sampling, however, is not without its drawbacks. First and foremost, sampling at the classroom level introduces a bias, especially with regard to enrollment status. Since full-time students will enroll in more classes than part-time students, they will have a higher probability of being sampled.

A Center analysis was conducted to investigate potential bias based on a number of student demographic characteristics. Of these, only enrollment status was found to be sufficiently biased at the national level as to require correction. For this reason, we developed a weighting scheme so that the results, when weighted, would be representative of the total student population. The formulas we use are presented on this slide.



	Your Respondents Count	Your Respondents Percentage	Your Population	Size Group Comparison Population	2013 Cohort Colleges Population
Sex					
Male	424	47%	44%	43%	41%
Female	445	50%	56%	57%	59%
Race or Ethnicity					
American Indian or Native American	9	1%	0%	1%	2%
Asian, Asian American or Pacific Islander	61	7%	6%	5%	3%
Black or African American, Non-Hispanic	107	12%	13%	14%	13%
White, Non-Hispanic	525	59%	63%	53%	61%
Hispanic, Latino, Spanish	30	3%	5%	17%	12%
Other	48	5%	11%	9%	8%
International Student or Foreign National	80	9%	2%	1%	1%
Age					
18 to 19	237	26%	26%	22%	22%
20 to 21	248	28%	19%	18%	16%
22 to 24	144	16%	15%	14%	13%
25 to 29	84	9%	13%	14%	13%
30 to 39	71	8%	12%	14%	14%
40 to 49	45	5%	6%	8%	8%
50 to 64	20	2%	3%	4%	4%
65+	14	2%	1%	1%	1%
Enrollment Status					
Less than full-time	331	37%	63%	60%	57%
Full-time	565	63%	37%	40%	43%

The weights the Center calculates are appropriate at the national level, but may not be the best match for your local data.

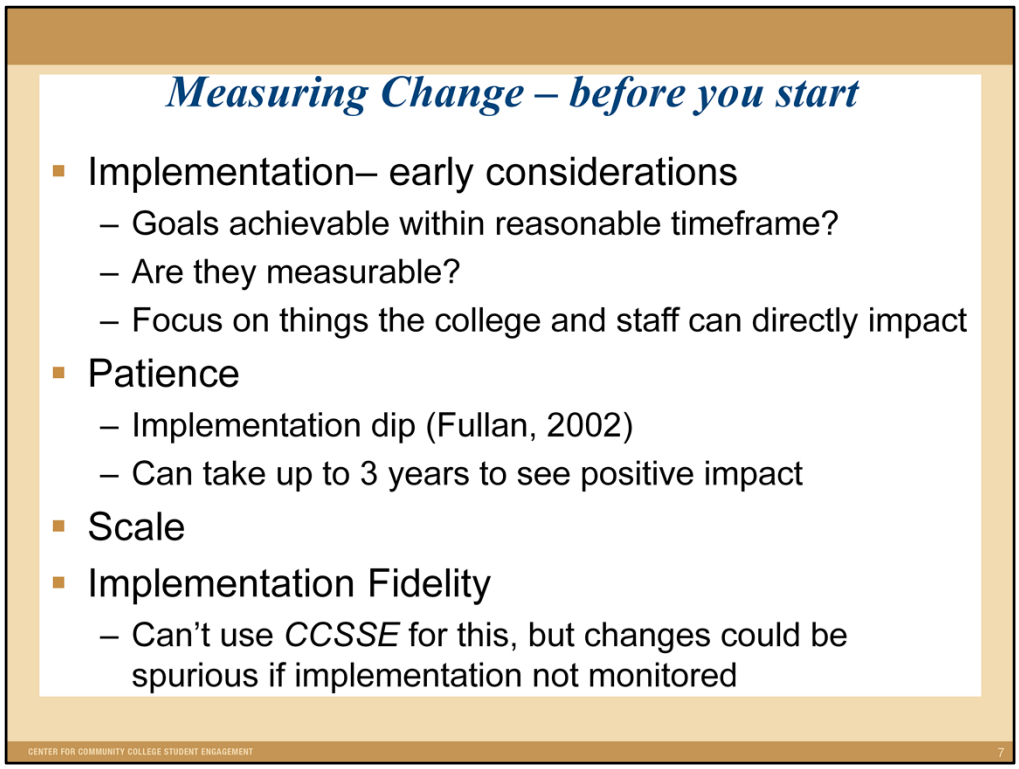
Therefore the Center recommends that you check the representativeness of your final data set to ensure that it is representative. You can start with Appendix Table I, Respondents to Underlying Population, to check this.

The columns are "Your Respondents Count", "Your Respondents Percentage", "Your Population", "Size Group Comparison Population", and "2013 Cohort Colleges Population"

You can compare the distribution of "Your Respondents Percentage" with "Your Population"

Looking at this table, Enrollment status, located at the bottom, is definitely reversed and requires weighting. Age appears to be a pretty good match so nothing is necessary here. White students appear to be slightly underrepresented, but not such that it would be considered problematic. Male and female groups also appear to be within reason.

So, for this college there does not appear to be a systematic bias that would need to be corrected for through weighting, aside from enrollment status.



I want to take a few minutes to talk about several aspects of measuring change that, at first glance, may appear to have more to do with implementation design, but can be crucial to the success or failure of any effort to measure change. Simply collecting outcome data at the end or at infrequent intervals during the intervention period is not sufficient. First…

1. **Are goals achievable within reasonable timeframe & Are they measurable?** Goals that are too ambitious will leave the people who have to ultimately design and implement interventions at a loss for a clear plan to achieve the end goal. Overly ambitious goals or goals that lack focus are also difficult to measure as there may often be extraneous influences that are difficult to measure.

   → An example here would be to focus on selected items within a benchmark rather than setting a goal to increase a particular benchmark over the next two years.
   → Initiatives should focus on things the college and staff can directly impact.

2. **Change is balance between demand for quick results and a long-lasting solution.** With pressing political and public demand for highly-visible short-term results, it becomes difficult to continue pursuing a course of action that is not delivering results quickly. One of the biggest barriers to successful educational change or improvement is a **lack of patience** among influential stakeholders.

   On reason programs can fail – (Michael Fullan) Implementation dip – the near-term decline in performance as students and – sometimes faculty – learn new skills.
   → With proper support and persistence, dip can be reversed.

3. **SCALE:** It is also important to remember that scale is a critical factor for observing effects of a program through a survey. *CCSSE* and *SENSE* are institutional-level measures and, if a program only reaches a small segment of your population, the effects may not be evident through survey results.

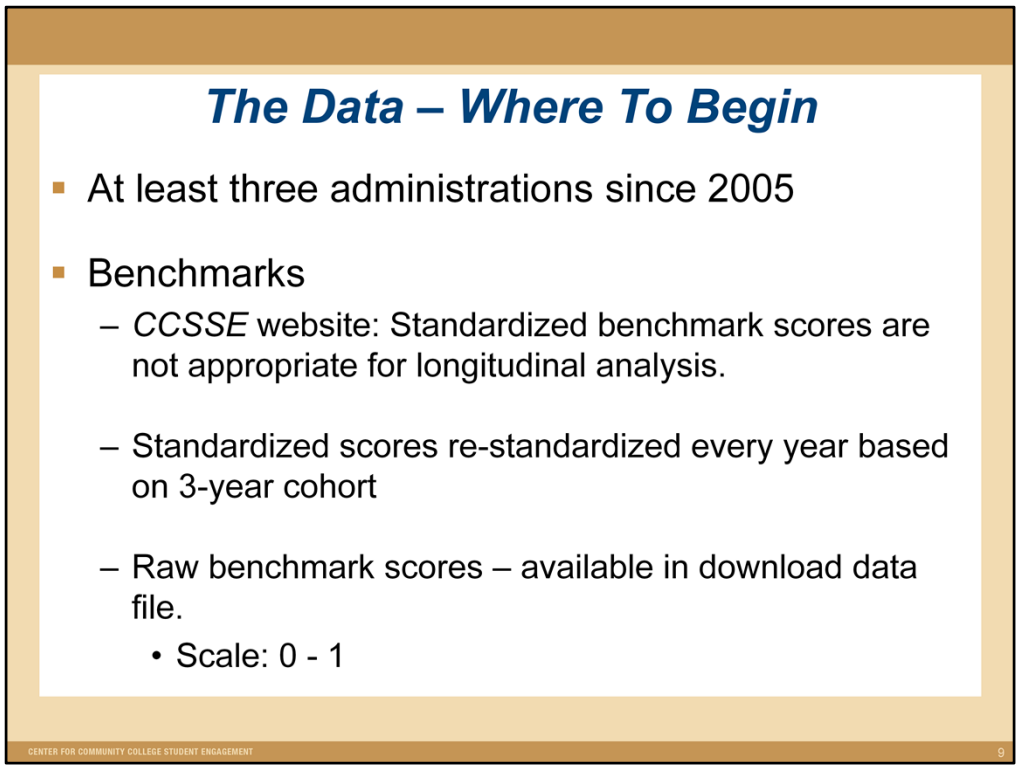
4. **Finally - Implementation Fidelity. Without assessing whether an intervention was implemented as designed, results, positive or negative CANNOT be validly associated with the program.** While *CCSSE* cannot be used to assess implementation fidelity, changes in *CCSSE* results (or those of any other measure, for that matter) cannot be attributed to the program.

With the exception of raw benchmarks, all survey response data presented today can be obtained from the online reporting system – either the standard reports page or the custom report request page. Means and frequencies are available in excel format.

If you do not have these data from previous administrations, data from 2014 and 2015 are currently available on the website as are the current 2016 data. If you need data from earlier administrations, please contact your liaison and they can send that to you.

NOTE: If you have experienced difficulties opening downloaded excel files, a recent Microsoft security update may be the cause. We have figured out a work-around for this. If you have any difficulties, please contact your liaison or one of the research team and we will be happy to help you open your files.

Working with your raw data file will require weighted analysis. It is possible to do this analysis in excel, but it is not the most straight-forward process. The Center is currently developing a guide for conducting weighted analysis in excel and it will be available on our website sometime this fall.



While only 2 time points necessary to establish a line, at least 3 are necessary for a trend – and even more for a reliable assessment of the presence and persistence of a trend. Survey data prior to 2005 are not comparable because many of the items in the surveys were modified, removed, or new ones added during the item development and pilot phases.

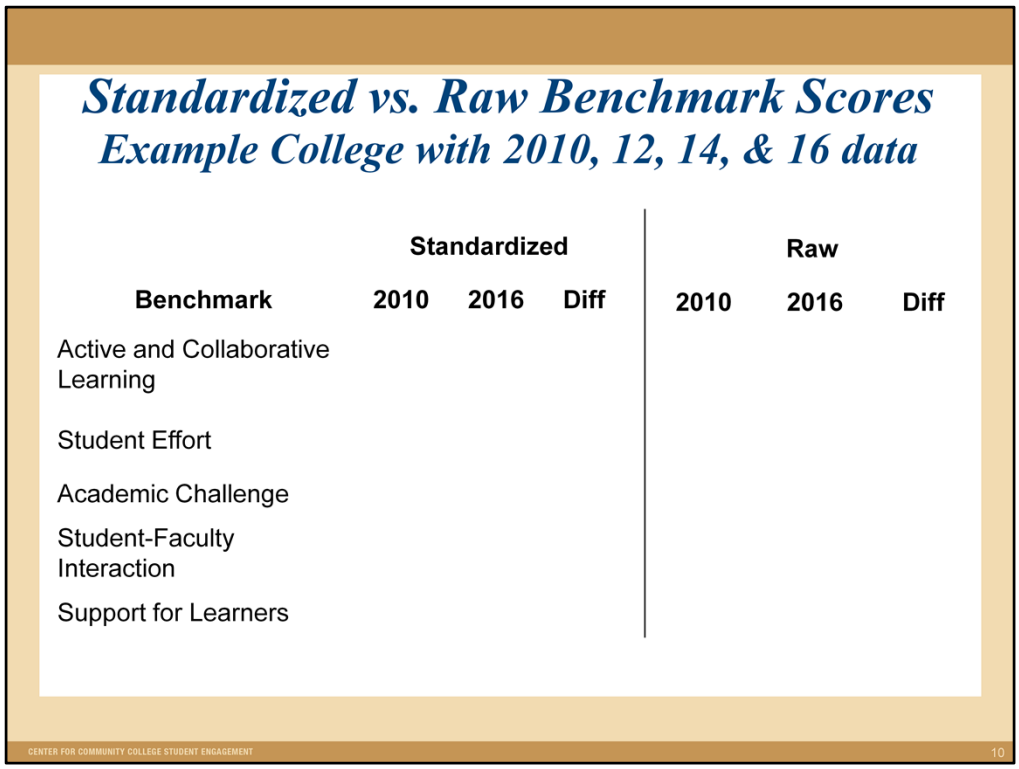
Many *CCSSE* users are very familiar with our standardized benchmark scores and, because the standardized scores are the ones we present in our on-line reporting system, the first thought is to use these.

However, *CCSSE* website states standardized benchmark scores are not appropriate. Why not?

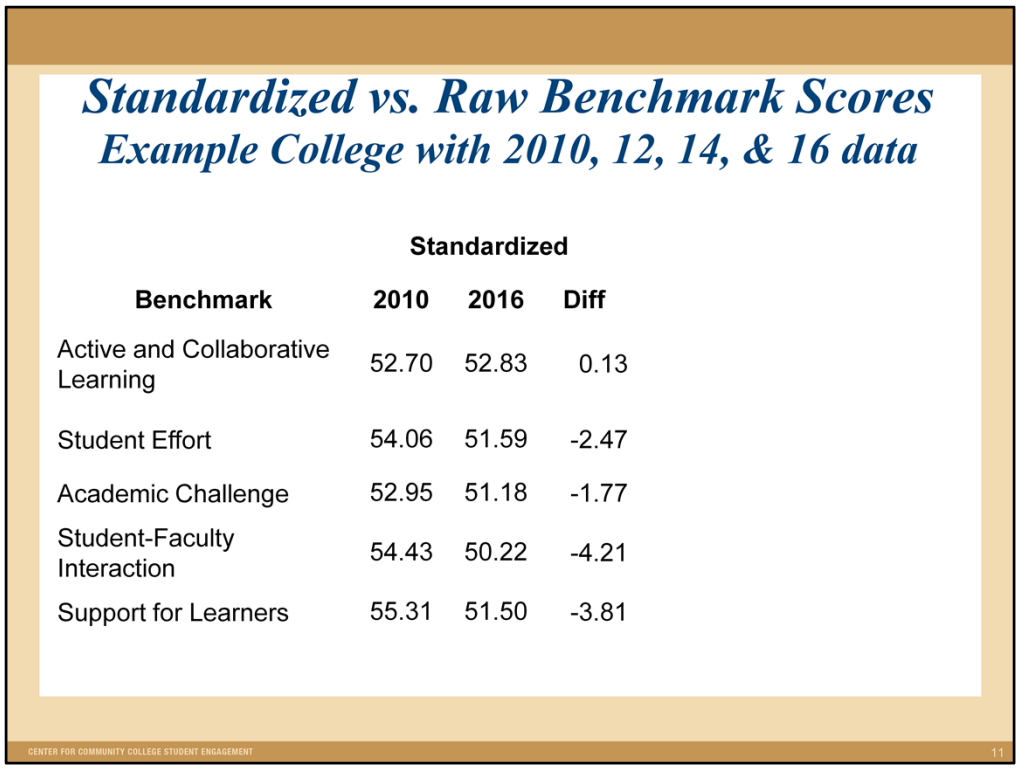
- Every year standardized benchmarks are recalculated based on that year's 3-year cohort. On average, this means that approximately 1/3rd of the colleges included in the standardization process change from year to year.
- A benchmark score of 51 in one year is not necessarily the same as a 51 in any other year. These scores were designed to present a relative snapshot in time.
- If you participated in 2015 and not in 2016 and logged into the reporting site and compared your results on the 2015 reporting pages to those on the 2016 reporting pages, you will find that your benchmarks have changed in 2016 even though your data did not. While these changes from a participation year to a non-participation year are frequently not very large, the implications for the interpretations of standardized benchmark scores from one participation year to the next, may become uncertain. We will see an example of this shortly.

So what should I use? Your download data set available from the standard reports page includes the standardized scores, but also what we call raw benchmark scores. Since the raw benchmark scores are not standardized, they are unaffected by the changing characteristics of the cohort population from year to year.

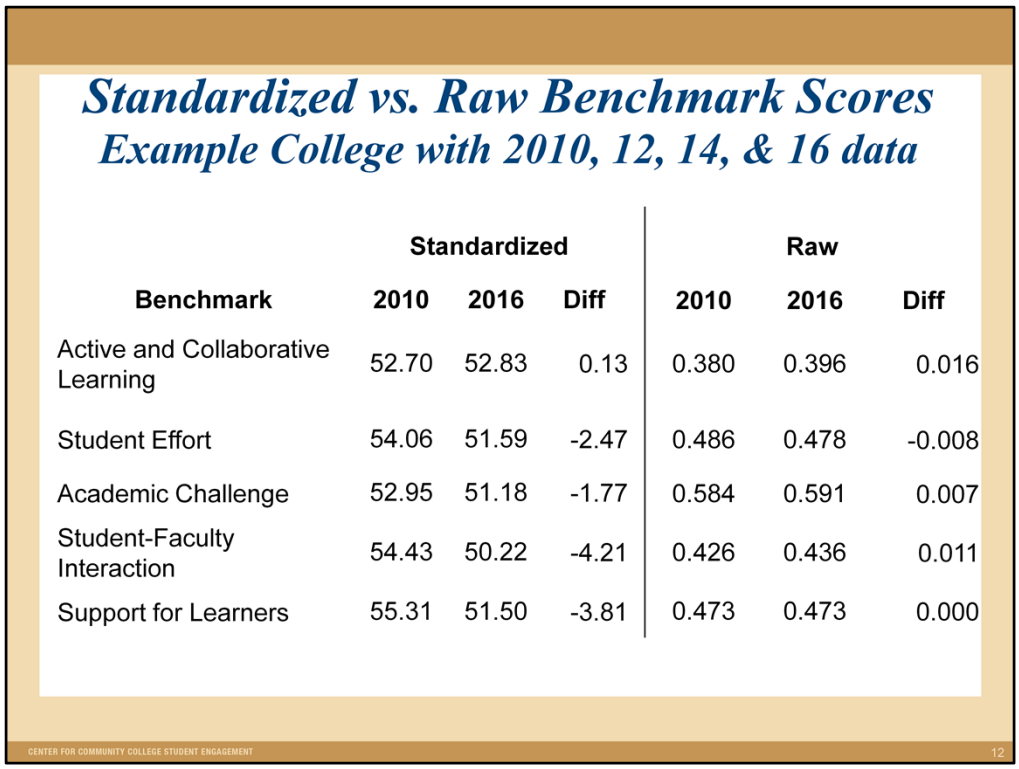
At this time, I will turn the presentation over to Colleen.



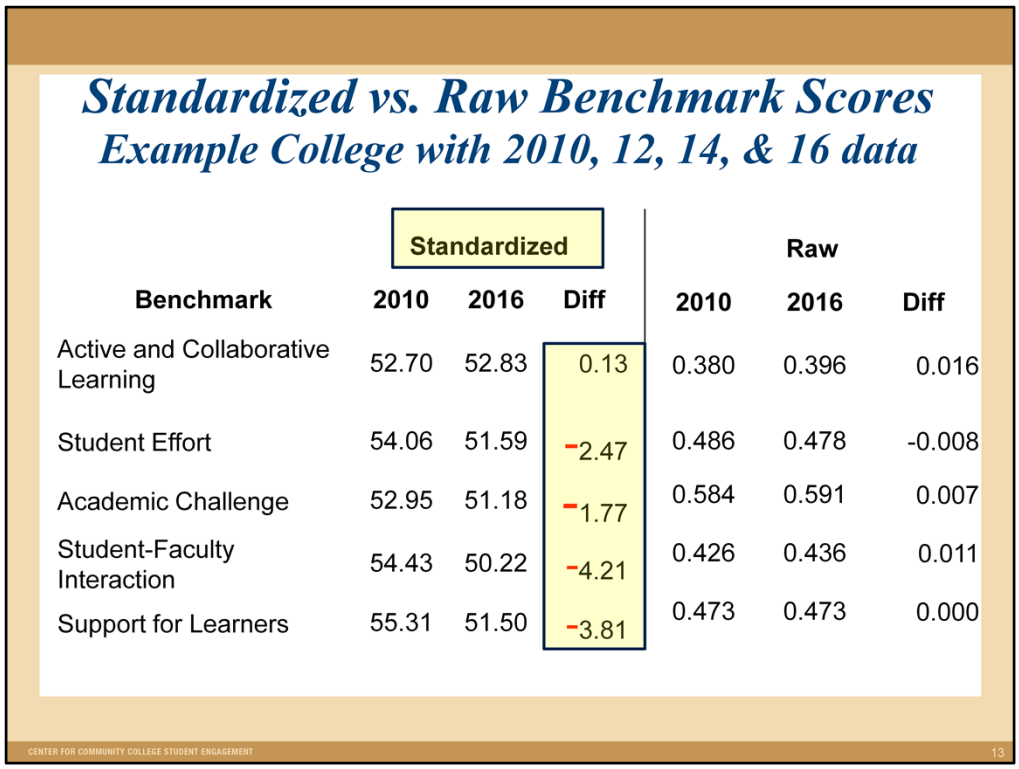
Hello. I am Colleen Bullock. Let's talk about standardized and raw benchmarks. Due to the limitation of space, in this table I am only presenting results for this Example College from the first administration in 2010 and the most recent administration in 2016, but many of my examples will include data for all four years. ⏭



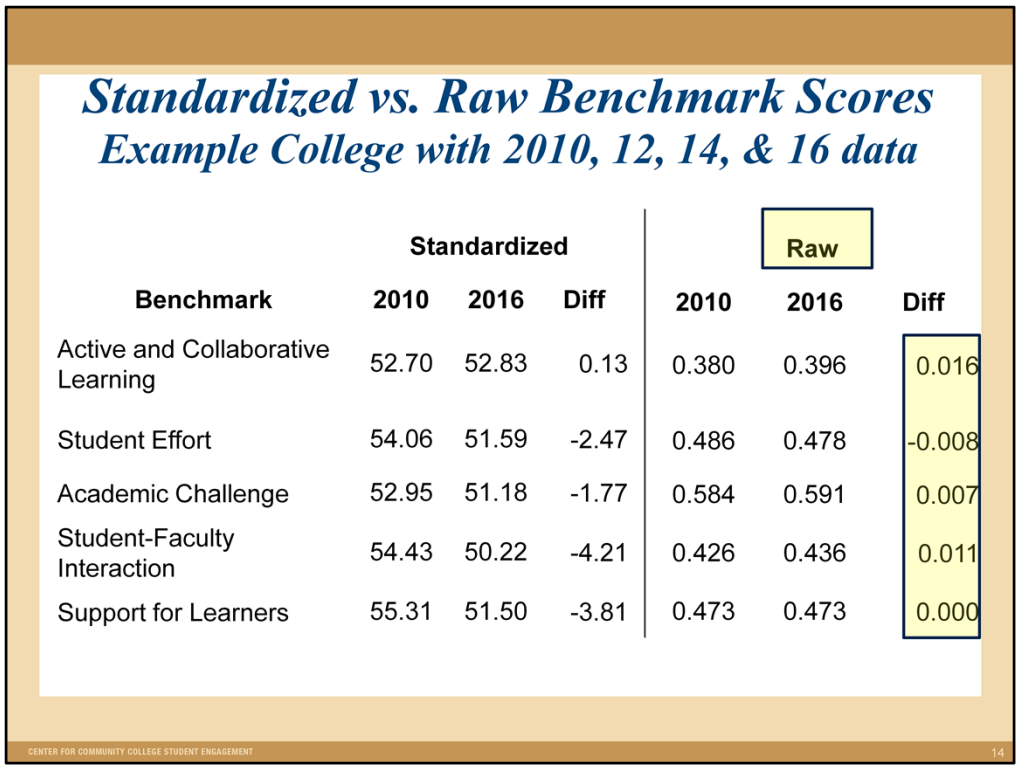
Here we see a table of *CCSSE* standardized benchmark scores, and their differences between 2010 and 2016. What do you notice about them? Join in and type your responses in the participant chat window in the lower right-hand side of your browser window. ⏭



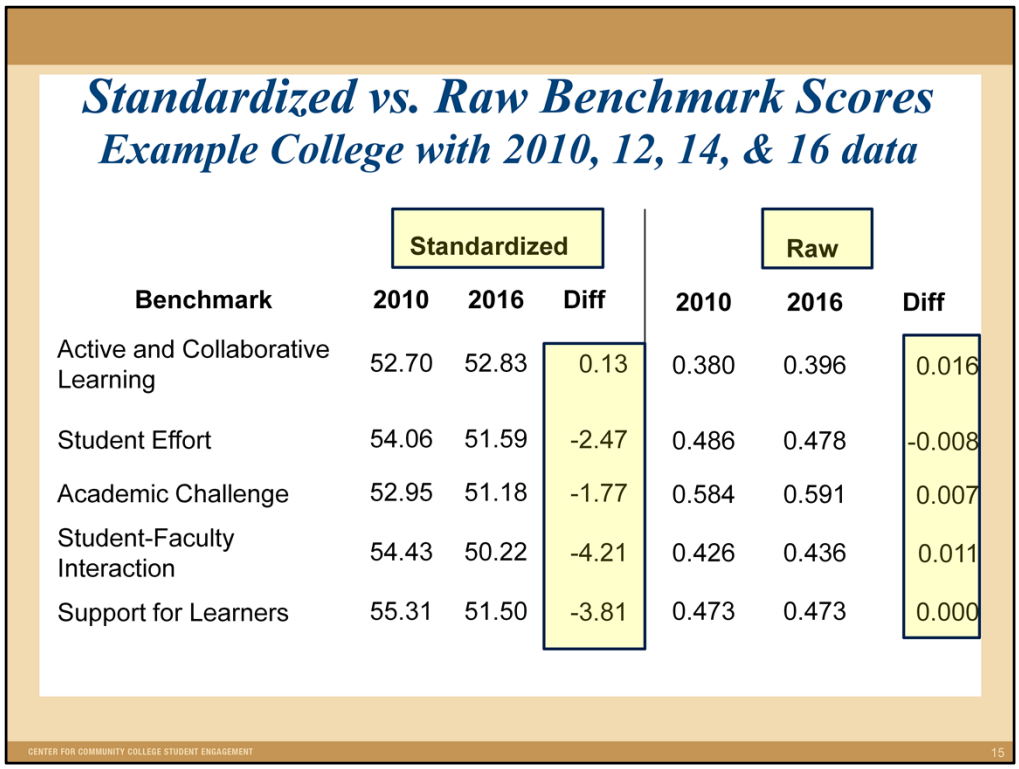
Here we see the raw benchmark scores, and their differences between 2010 and 2016. What do you notice about these? Again, join in by typing your responses in the participant chat window in the lower right-hand side of your browser window. ⏭



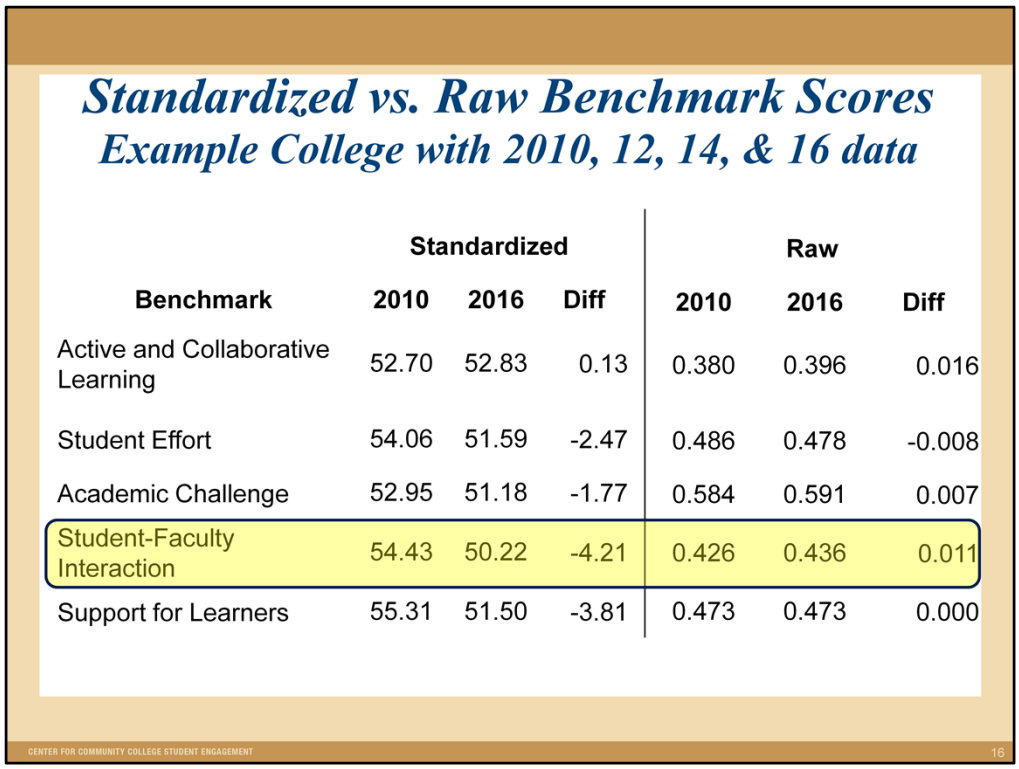
As you might have seen, the differences between the 2010 and 2016 standardized benchmarks scores for this Example College are almost all negative, suggesting that overall engagement **declined** between 2010 & 2016. ⏭



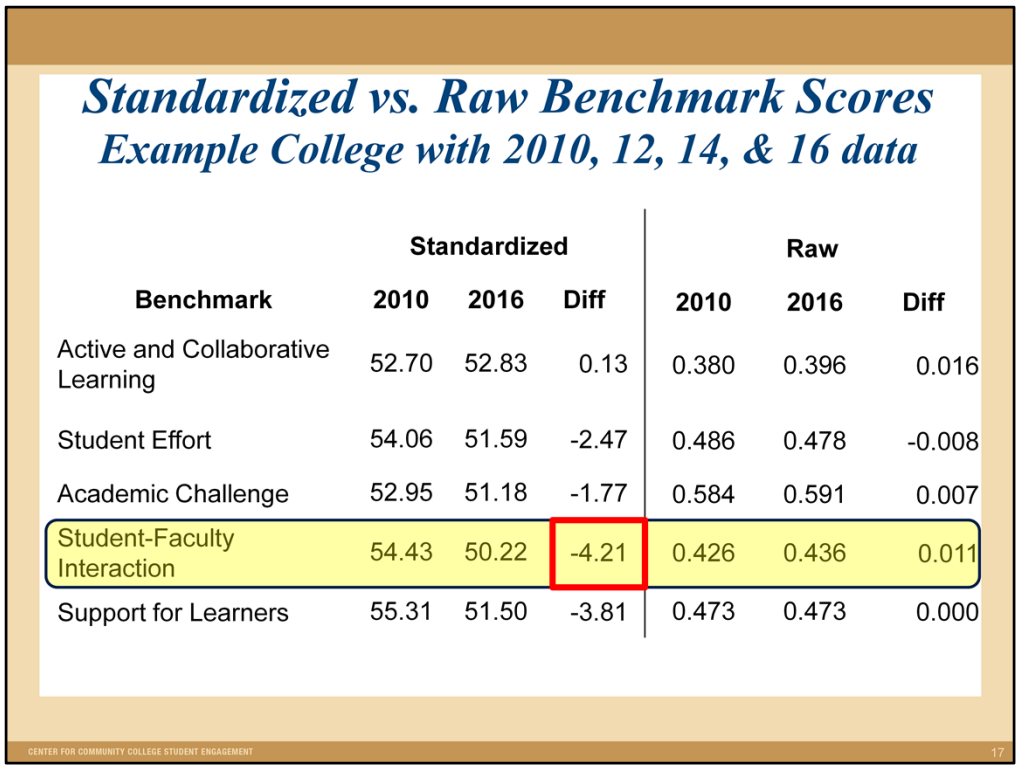
Now, let's take a look at the raw benchmark scores. Unlike the standardized benchmark scores, all of the differences between raw benchmark scores (except student effort) are positive, suggesting that this college showed some **improvement** in overall engagement: ⏭



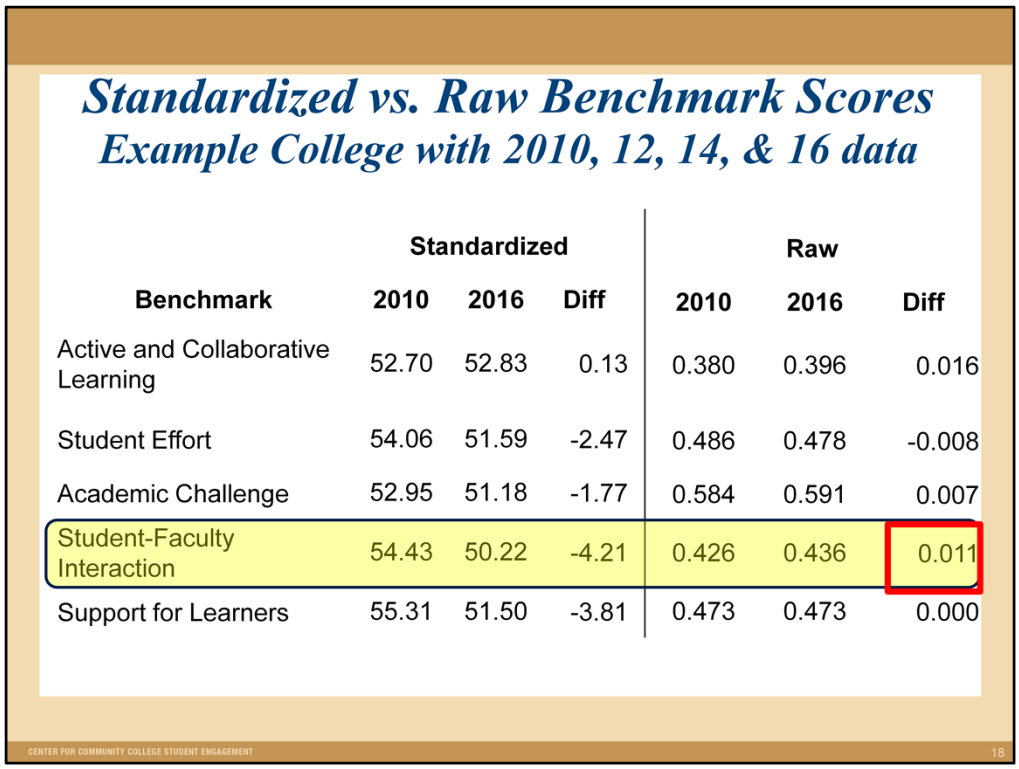
…which is the opposite interpretation from that of the standardized benchmark scores. ⏭



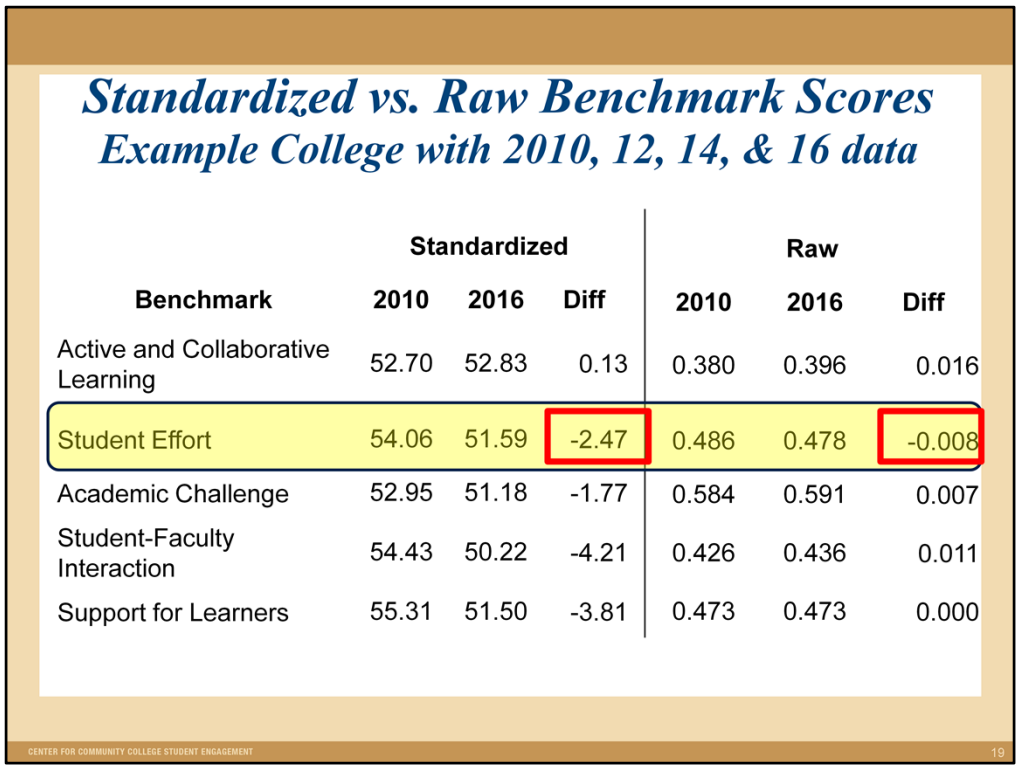
Now let's focus on the student-faculty interaction benchmark as an example. What do you notice about the benchmark scores? ⏭



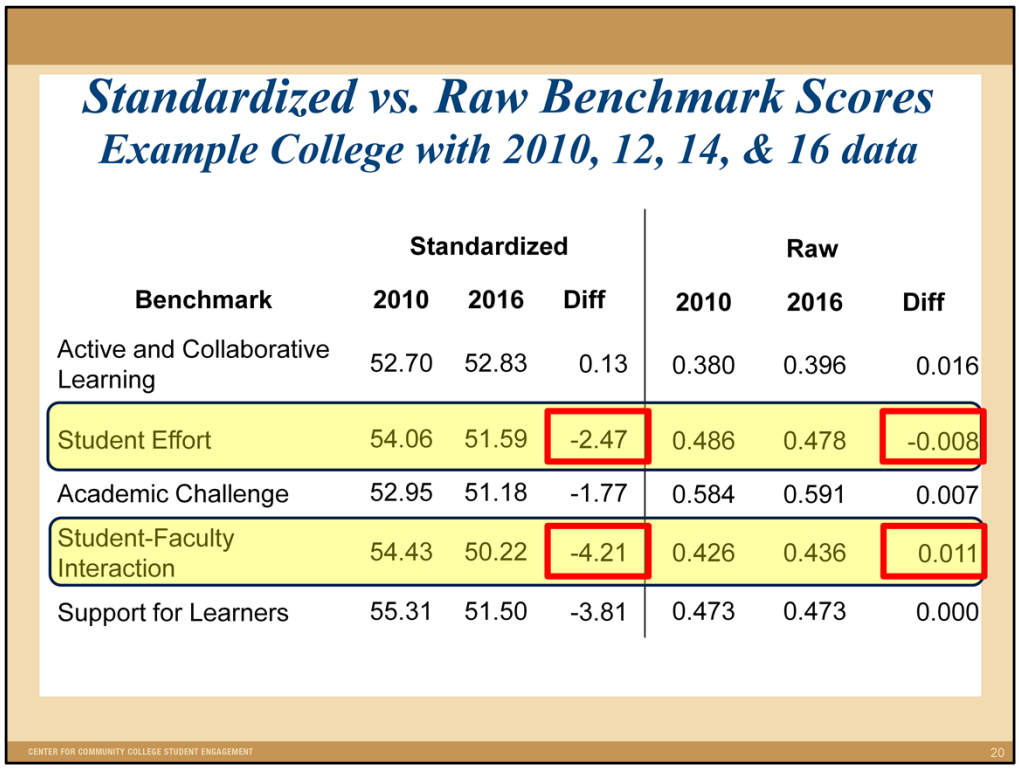
This standardized benchmark score drops by 4.21 points between 2010 and 2016, a percent change of **approximately NEGATIVE 7.7%**, ⏭



…whereas the change in the raw benchmark score, is 0.011, a positive 2.6% percent change from 2010 to 2016. The changes in scores of the standardized and raw benchmarks are in opposite directions. This pattern isn't always the case, notice that… ⏭

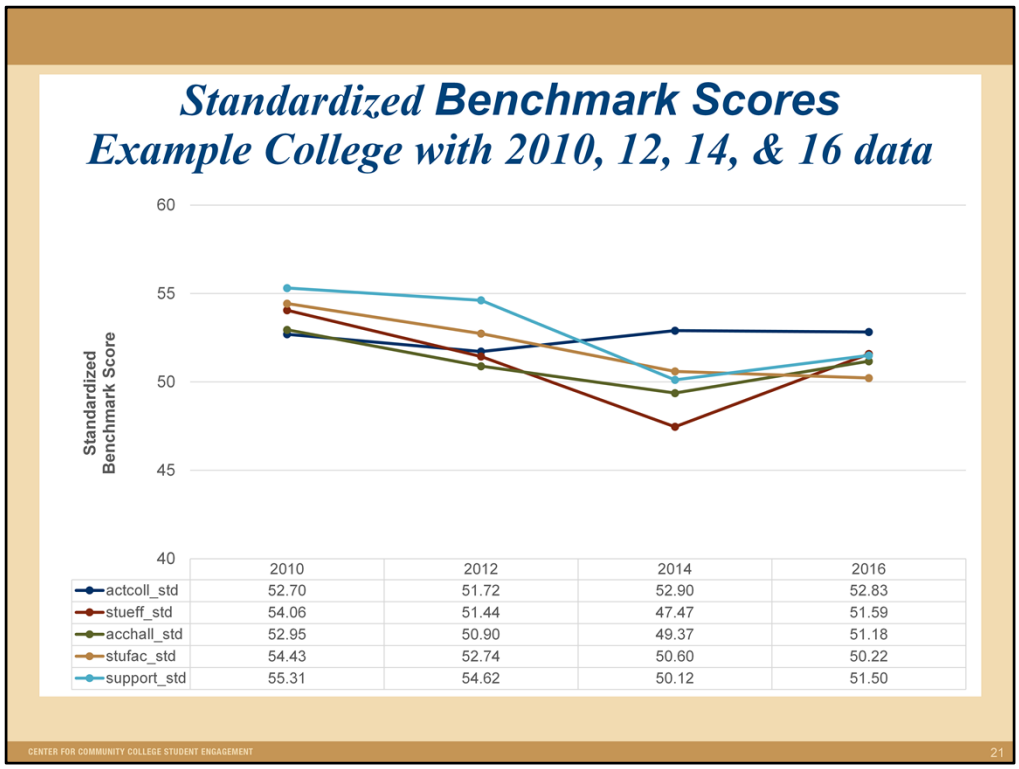


…the student effort benchmark scores showed a decline regardless of which version of benchmark scores is used: a -2.47 point difference in the standardized scores and a -0.008 point change in the raw benchmark score. ⏭



Why does this happen? As noted earlier, the standardized benchmark scores are recalculated annually based on the full 3-year cohort. So, the standardized benchmark scores are relative to the colleges in that specific 3-year cohort. The raw benchmarks, however, are unaffected by the standardization process and, therefore, reflect the actual changes in responses among students at your college to the items underlying the benchmarks.

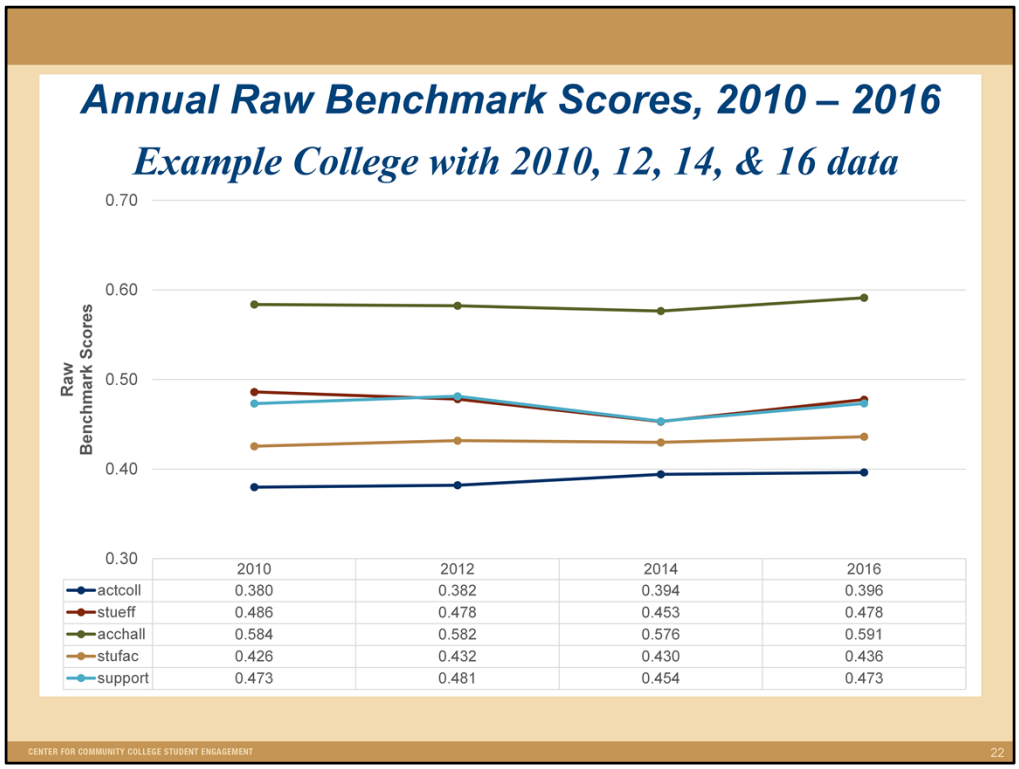
Let's look a little more closely at these data. ⏭



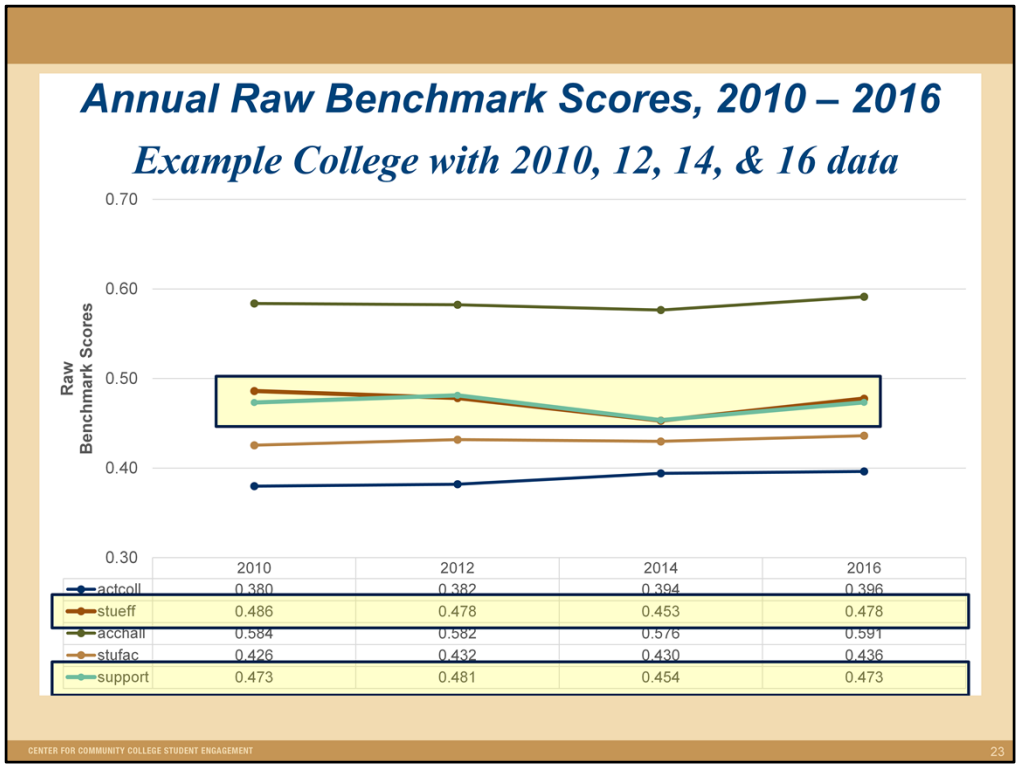
Here are the standardized benchmark scores from the Example College graphed for years 2010-2016.

Notice how much the benchmark scores fluctuate from year to year. One reason for the fluctuation in the standardized benchmark scores is that different colleges are in each three-year cohort.

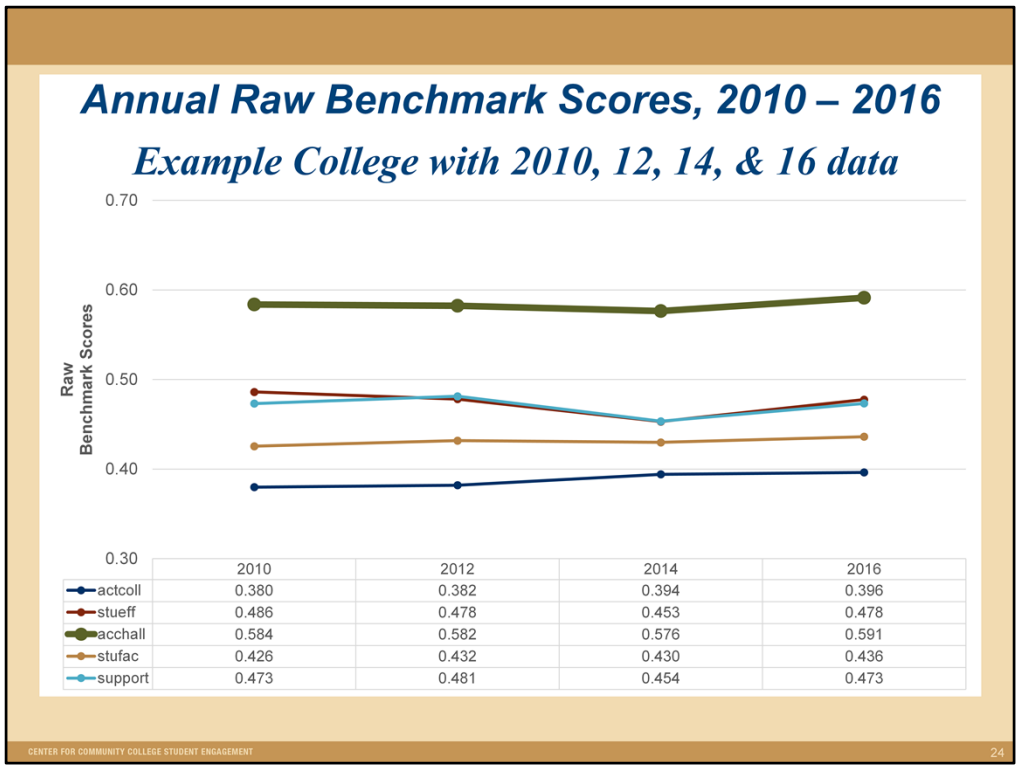
I'll talk more about this fluctuation later in the webinar, but for now lets look at some general characteristics of the corresponding graph of the raw benchmark scores. ⏭



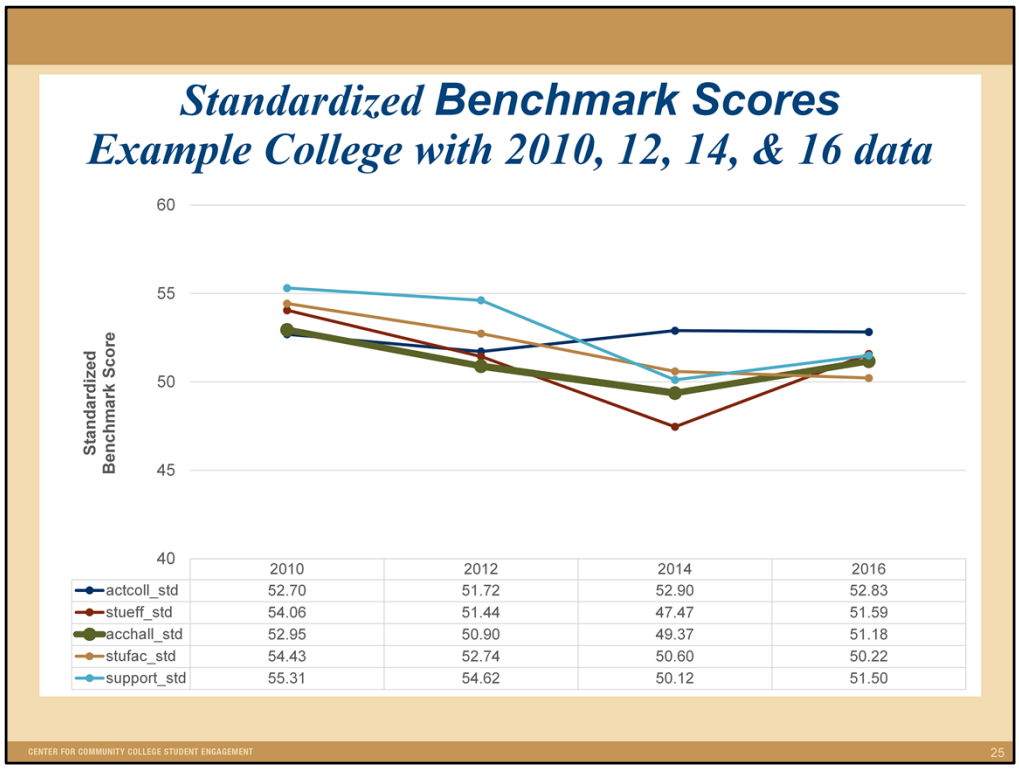
These scores appear somewhat flat, although several benchmarks do have a slight increase … ⏭



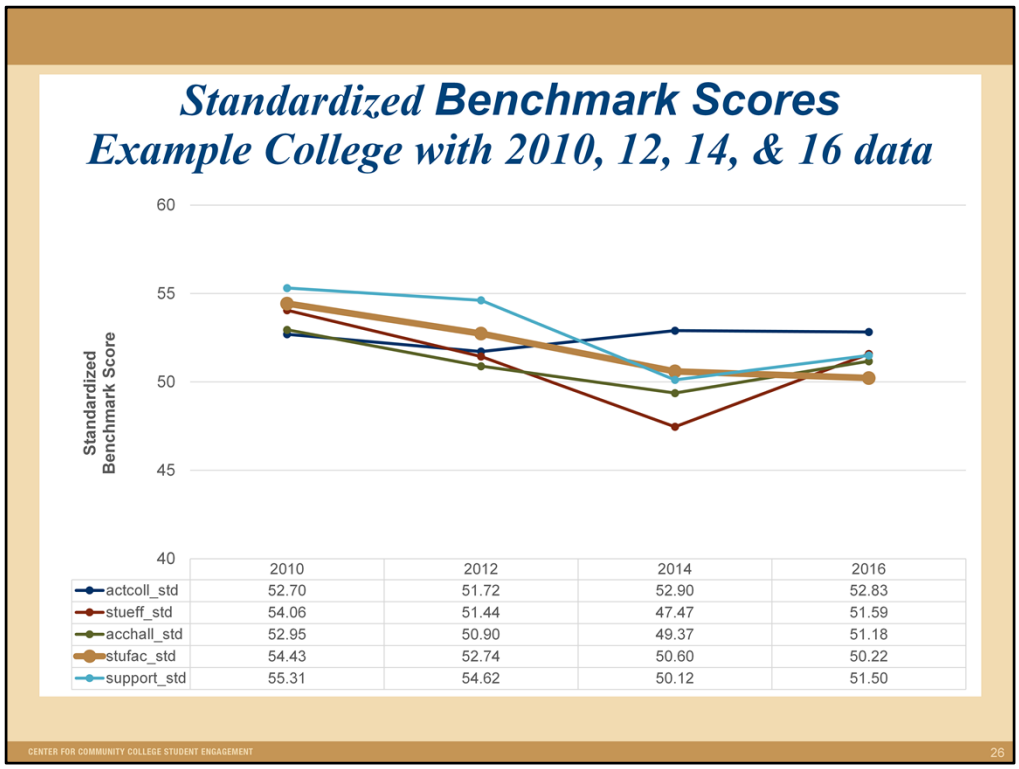
We also see that there are two benchmarks that are depressed in 2014 but appear to rebound in 2016. ⏭



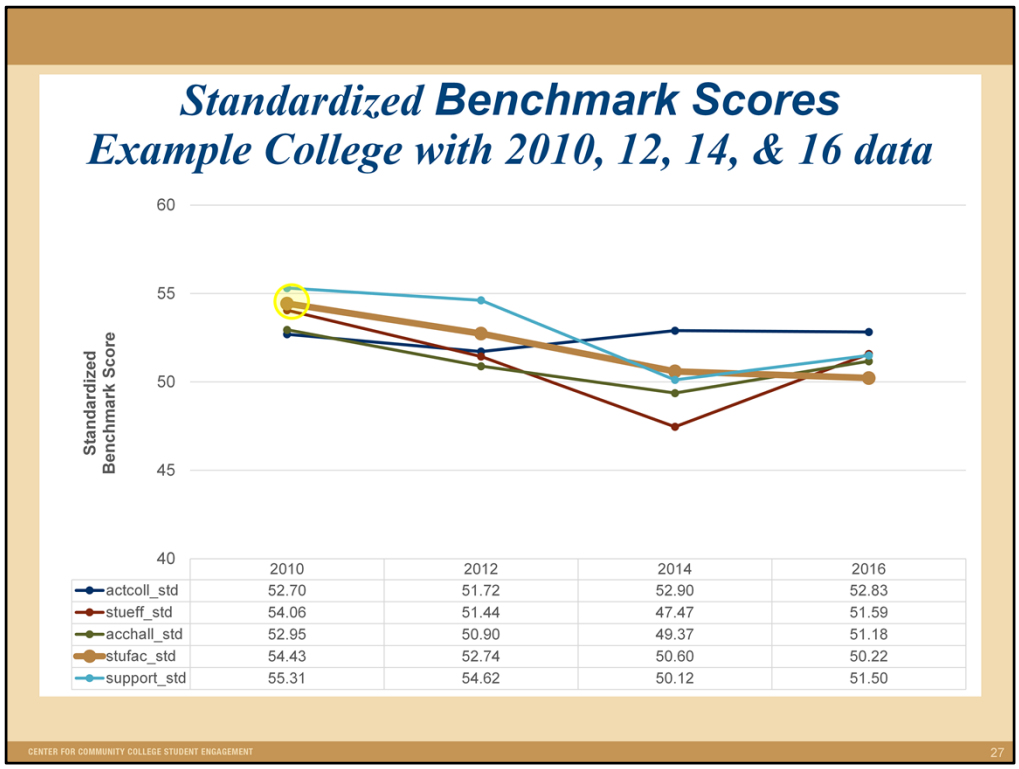
We see that academic challenge (the line in green) is the strongest benchmark, but back on the graph of standardized benchmark scores ⏭



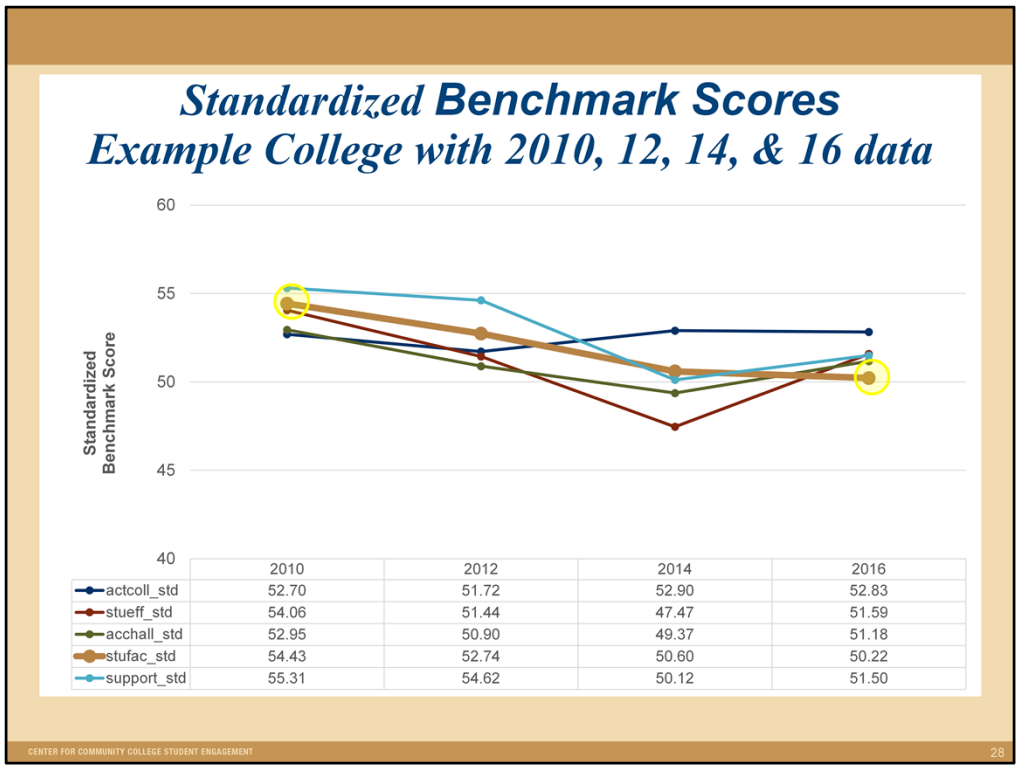
…we see that the academic challenge standardized benchmark scores fluctuates between the lowest and second lowest position on the graph.
This emphasizes how the process of data standardization, that anchors the institutional scores to the national cohort distribution, can present a different picture of the same data.
⏭



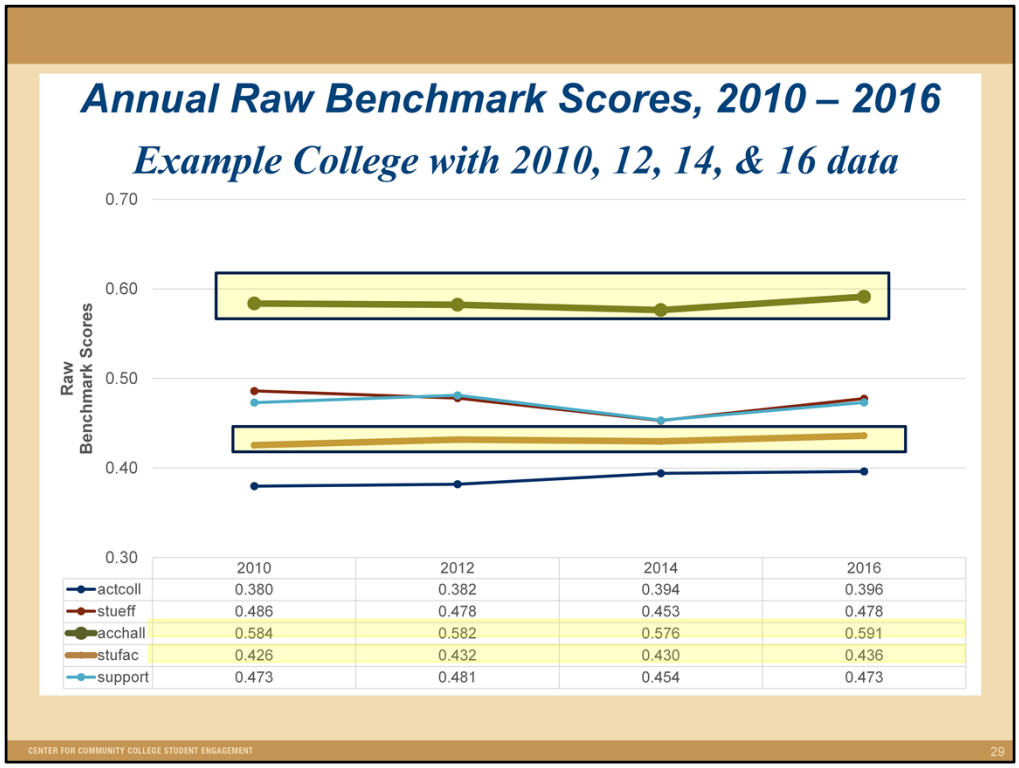
Also notice that the student-faculty interaction benchmark (the gold line) shows a steady decline over time period analyzed. ⏭



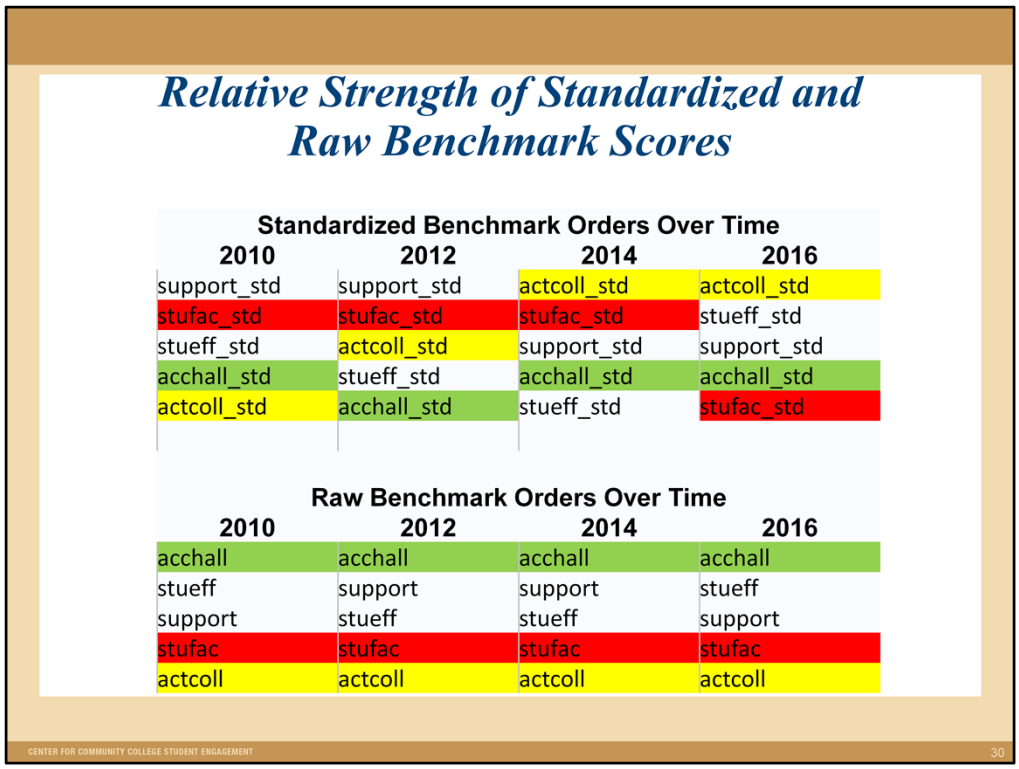
This is the second highest benchmark in 2010-2014 … ⏭



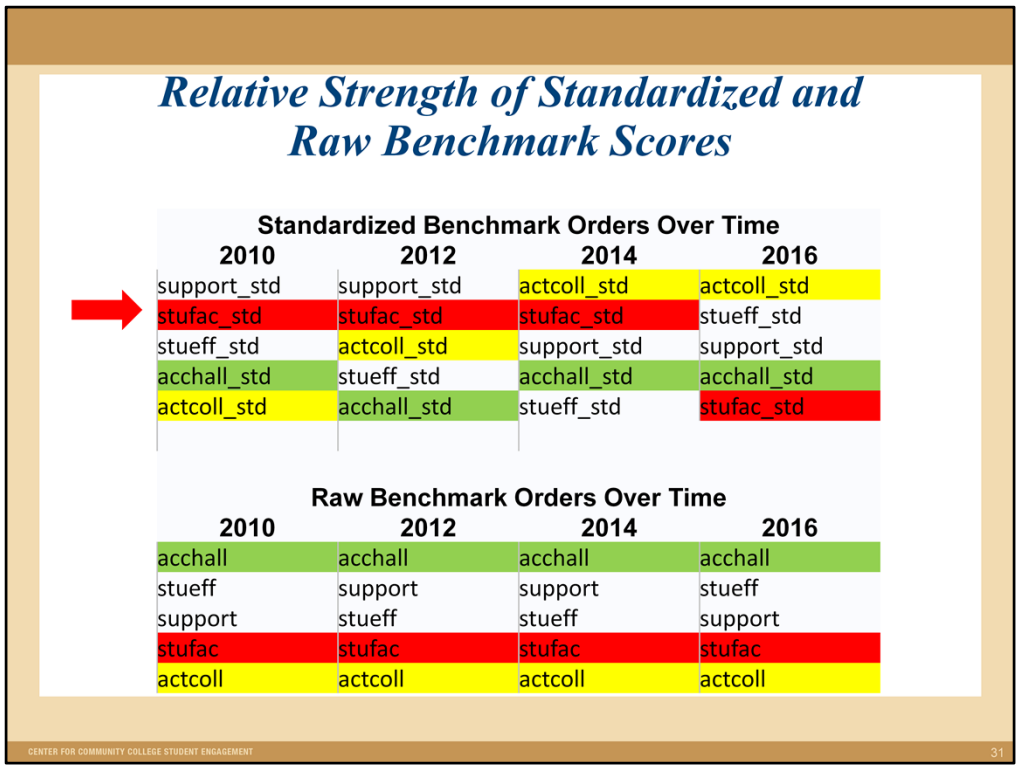
…and then, in 2016 we find it as the weakest benchmark. ⏭



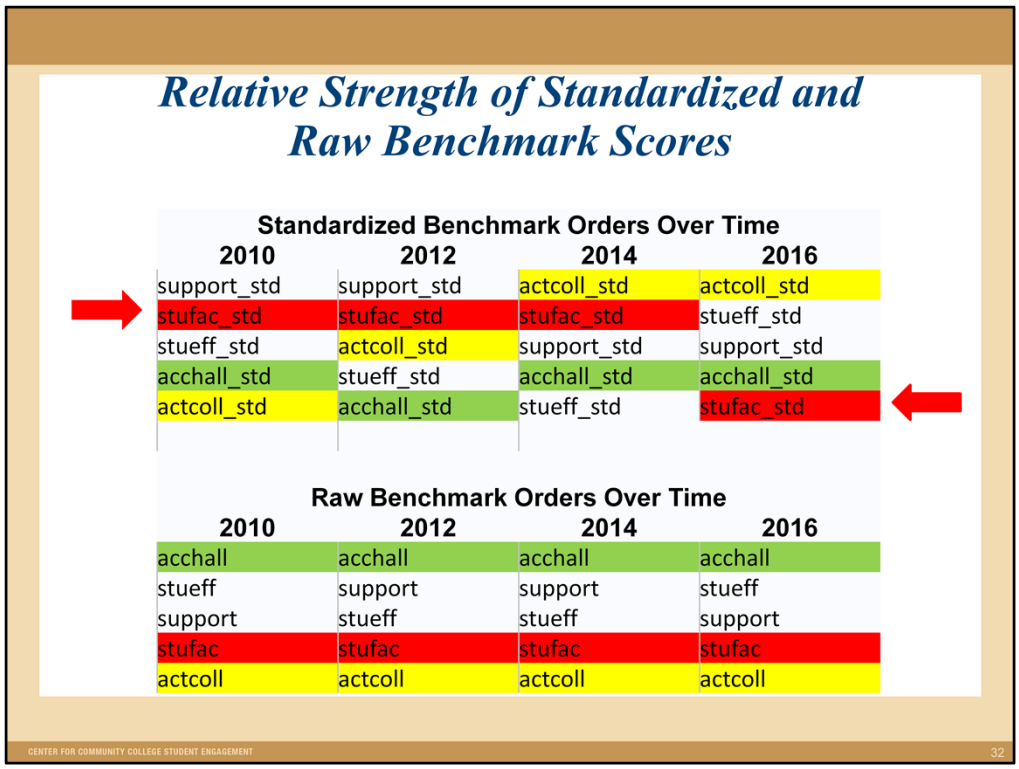
Now turning to the raw benchmark graphs, although these trend lines look rather flat, these two raw benchmark scores actually creep along a positive trend.
In summary, a different decision might be made on where to focus improvement efforts based on which set of benchmark scores, standardized or raw, are used to inform the decision making process. ⏭



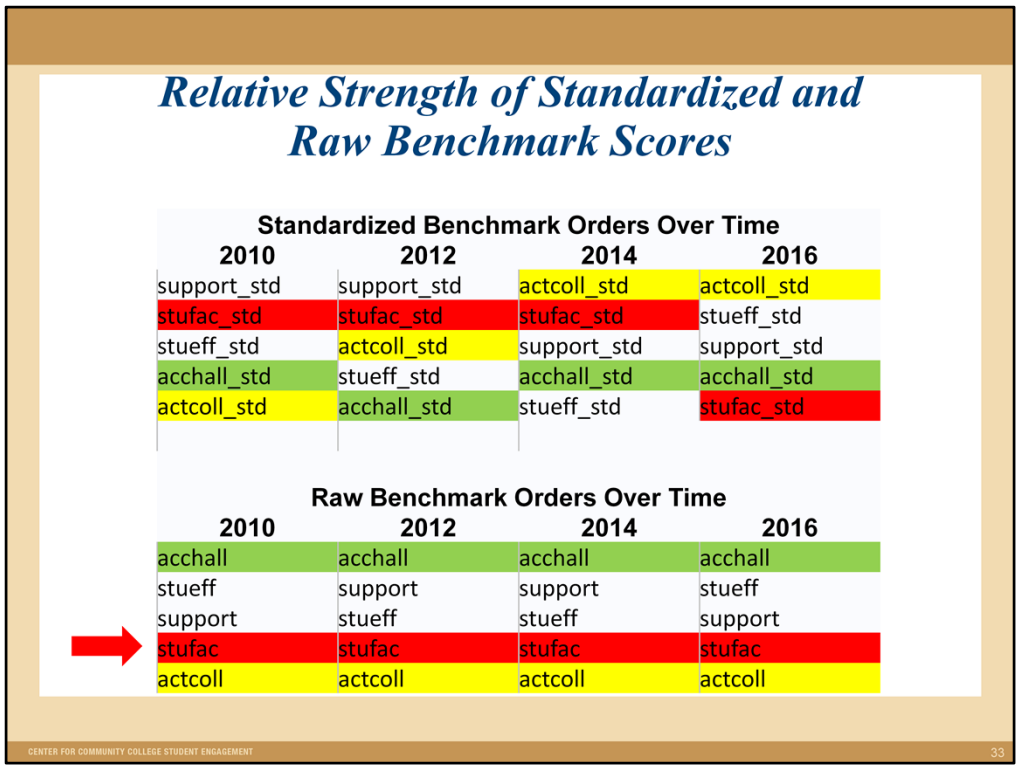
This slide allows us to view the relative positions of the standardized and raw benchmark scores together. What do you notice about the relative positions of the benchmark scores over time? ⏭



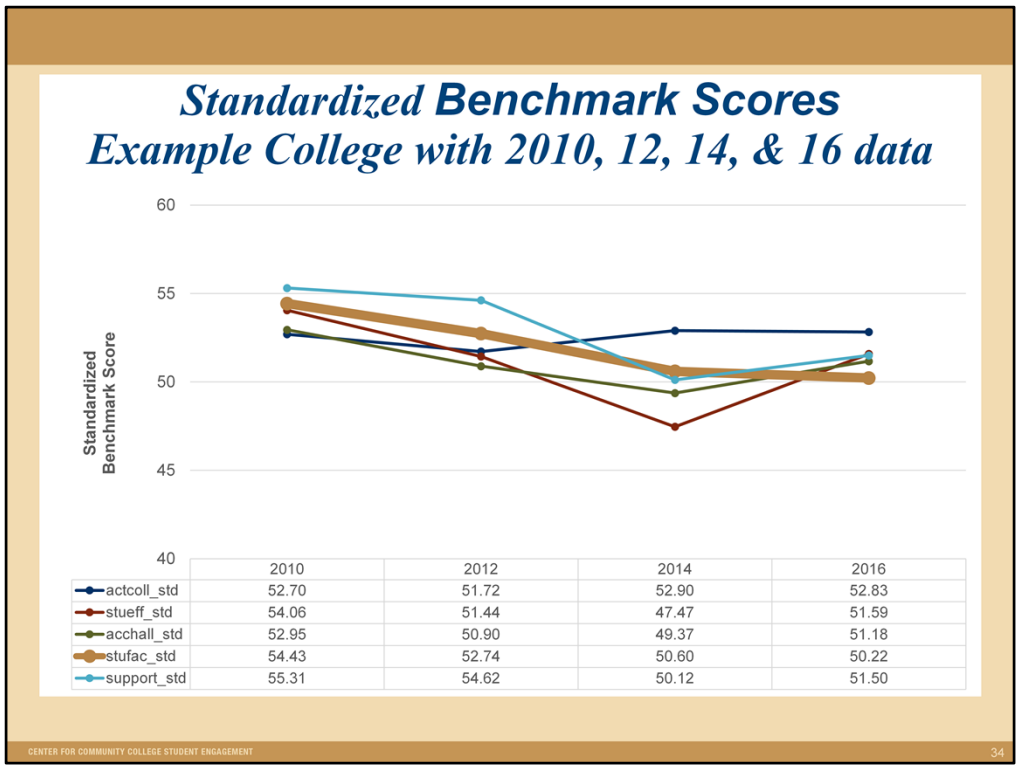
Looking at the standardized benchmark scores, the standardized student faculty interaction benchmark is the second-strongest benchmark in 2010-2014… ⏭



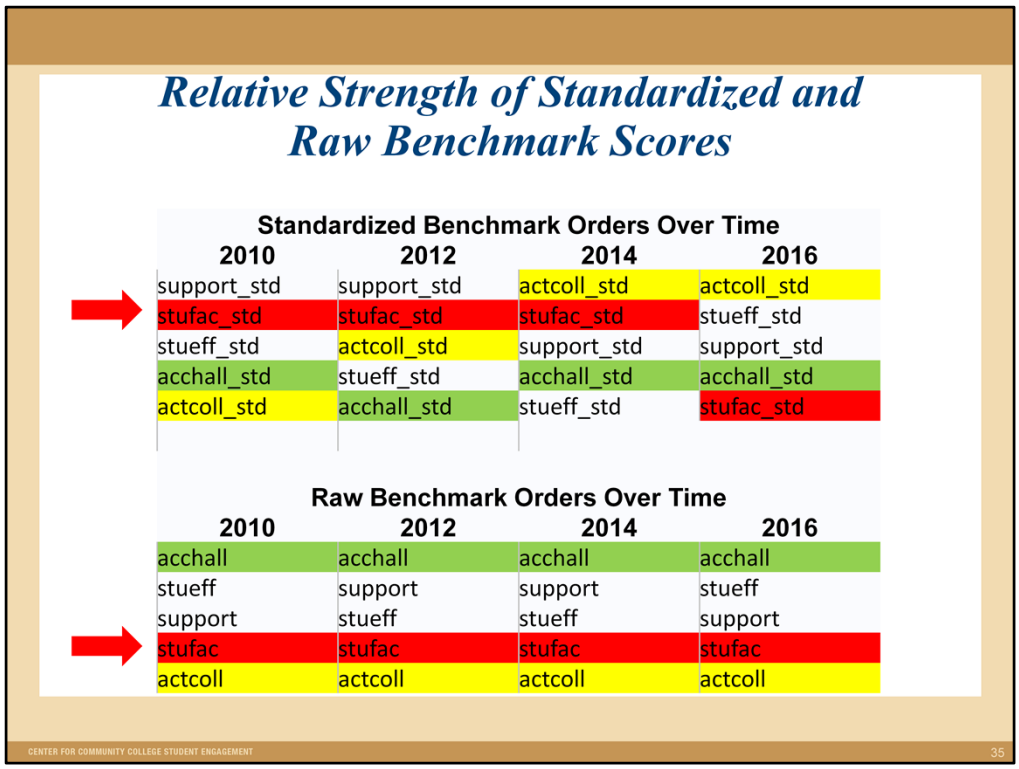
…until it takes up last place in 2016. ⏭



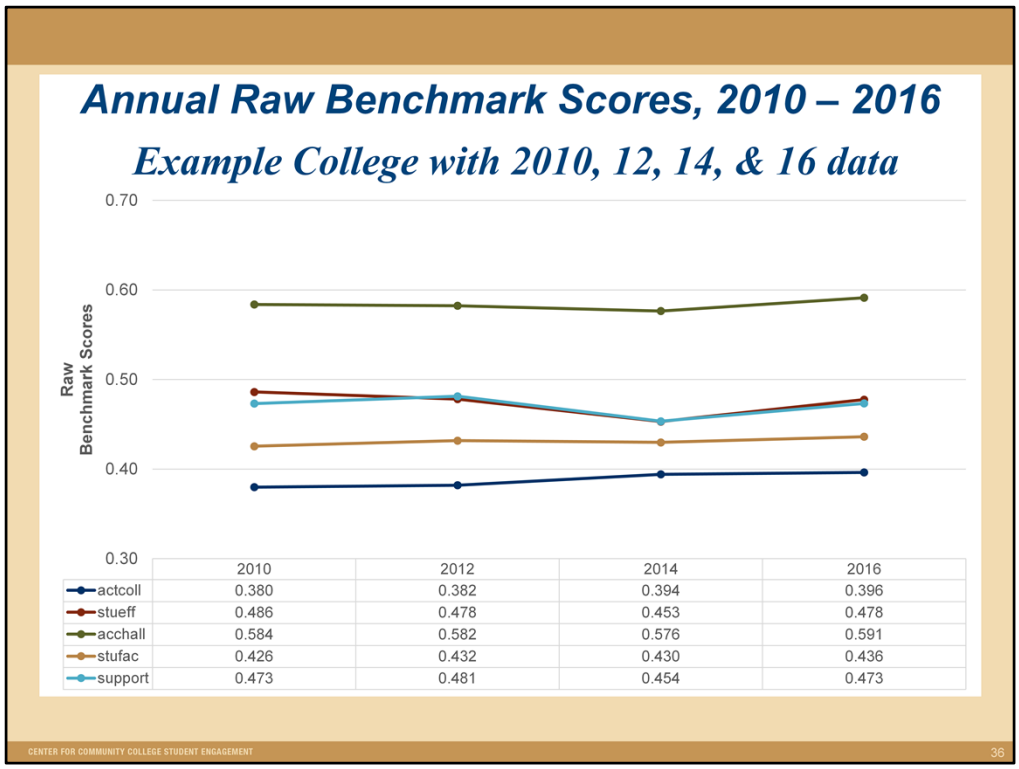
This is not the case for the raw benchmarks, where you can see that the raw student faculty interaction benchmark score is consistently second-last in all four years of the data. So what causes this change in relative position among the benchmarks, as we see with the standardized student faculty interaction benchmark score? Remember, this benchmark dropped from the second-strongest to the weakest position. ⏭



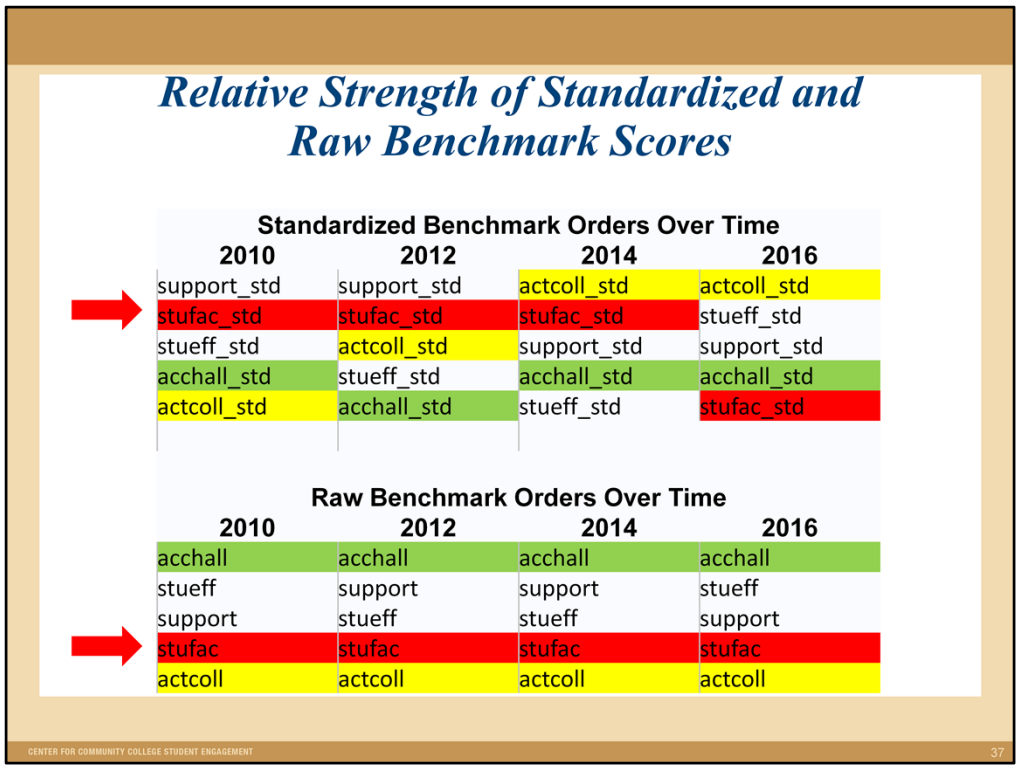
If we look again at the graph of the standardized benchmarks, we see that the standardized student faculty interaction benchmark score (the gold line) was steadily declining from 2010 through 2016. Notice the fluctuation in the other standardized benchmark scores. ⏭



It was this fluctuation in the other standardized benchmark scores that effectively allowed the standardized student faculty interaction benchmark score to remain in that second spot or ultimately be demoted to the weakest position. If we look again at the graph of raw benchmark scores… ⏭



… we can see that these scores did not dramatically fluctuate …. ⏭

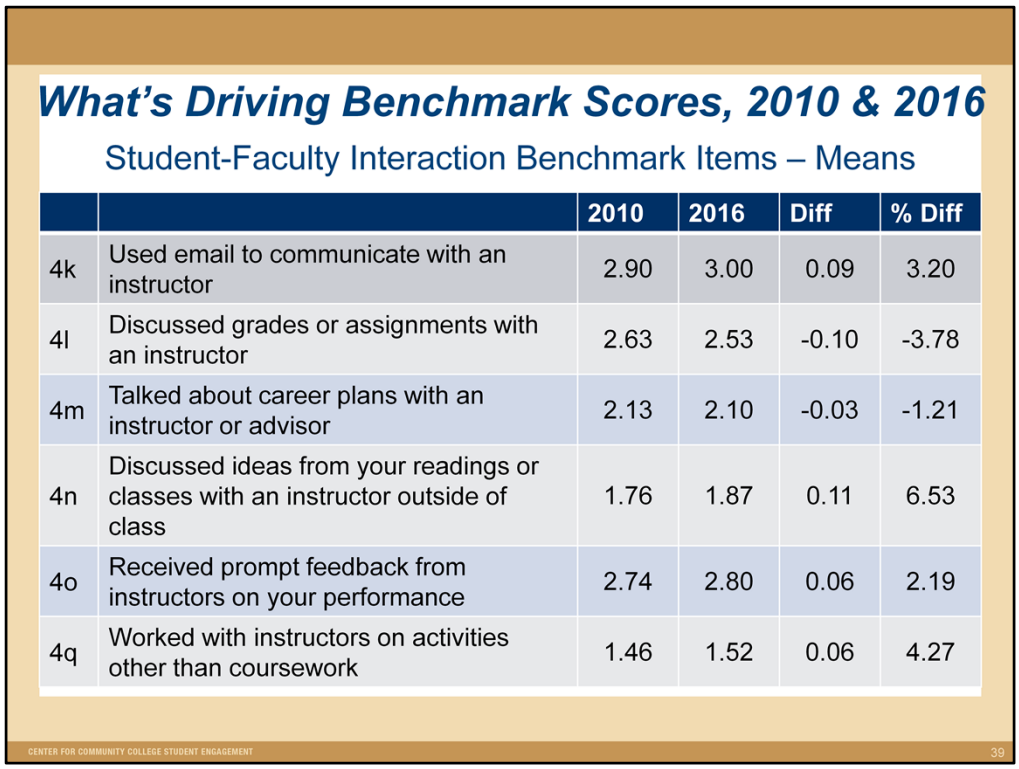


…and the relative positions of the strongest and weakest benchmarks did not change across the time period ⏭

Digging Deeper

Item	Variable	Responses	Your College Count	Your College Percent	Small Colleges Count	Small Colleges Percent	2014 Cohort Count	2014 Cohort Percent
Item 1								
1. Did you begin college at this college or elsewhere?	ENTER	Started here	296	56.3	88,467	70.9	308,277	70.5
		Started elsewhere	230	43.7	36,254	29.1	129,255	29.5
		Total	526	100.0	124,721	100.0	437,532	100.0
Item 4: In your experiences at this college during the current school year, about how often have you done each of the following?								
4a. Asked questions in class or contributed to class discussions [ACTCOLL]	CLQUEST	Never	12	2.3	2,511	2.0	11,467	2.6
		Sometimes	153	29.0	36,076	28.9	139,927	32.0
		Often	191	36.3	45,310	36.3	154,219	35.2
		Very often	171	32.5	40,863	32.8	131,995	30.2
		Total	526	100.0	124,760	100.0	437,608	100.0
4b. Made a class presentation [ACTCOLL]	CLPRESEN	Never	137	26.1	33,204	26.7	116,692	26.8
		Sometimes	206	39.3	50,726	40.8	178,114	40.8
		Often	124	23.7	27,989	22.5	98,723	22.6
		Very often	57	10.9	12,424	10.0	42,501	9.7
		Total	525	100.0	124,343	100.0	436,031	100.0
4c. Prepared two or more drafts of a paper or assignment before turning it in [STUEFF]	REWROPAP	Never	126	24.2	23,904	19.3	85,869	19.8
		Sometimes	181	34.9	36,842	29.7	126,649	29.2
		Often	120	23.1	37,201	30.0	130,124	30.0
		Very often	92	17.7	25,901	20.9	91,621	21.1
		Total	520	100.0	123,848	100.0	434,264	100.0
4d. Worked on a paper or project that required integrating ideas or information from various sources [STUEFF]	INTEGRAT	Never	64	12.3	11,778	9.5	41,514	9.6
		Sometimes	168	32.0	32,980	26.6	112,925	26.0

The benchmarks are typically the first measures people examine because they provide a high-level overview of what engagement looks like at their college.
However, for analyzing change over time, benchmark scores, even the raw benchmark scores, have a major drawback: they are composite scores based many survey items. Because of this, it can be very difficult to observe change at this level. If some items within a benchmark show improvement over time and others items decline, the opposing changes can cancel each other out, resulting in no change in the benchmark score. For this reason, analysis of data at the item level is much more sensitive to change. To observe change at the item level, only one item needs to be effected. For benchmark items, on the other hand, observable change will only happen if the positive changes among the individual items is greater than the negative changes. Analyzing data at the item level might provide data that may be more actionable and informative for your college then analyzing by benchmark score.
Focusing on single items instead of benchmarks allows you to focus on items that are central to college priorities, while benchmarks contain other items that may be irrelevant to your college's goals. These latter items, because they are not the focus of an intervention, may not improve, or alternatively, may realize a negative change, which will have a depressive effect on the entire benchmark score. With these points in mind, let's dig deeper into these data. We'll start by looking at the means and then turn to the frequencies. ⏭



What's Driving Benchmark Scores, 2010 & 2016

Student-Faculty Interaction Benchmark Items – Means

		2010	2016	Diff	% Diff
4k	Used email to communicate with an instructor	2.90	3.00	0.09	3.20
4l	Discussed grades or assignments with an instructor	2.63	2.53	-0.10	-3.78
4m	Talked about career plans with an instructor or advisor	2.13	2.10	-0.03	-1.21
4n	Discussed ideas from your readings or classes with an instructor outside of class	1.76	1.87	0.11	6.53
4o	Received prompt feedback from instructors on your performance	2.74	2.80	0.06	2.19
4q	Worked with instructors on activities other than coursework	1.46	1.52	0.06	4.27

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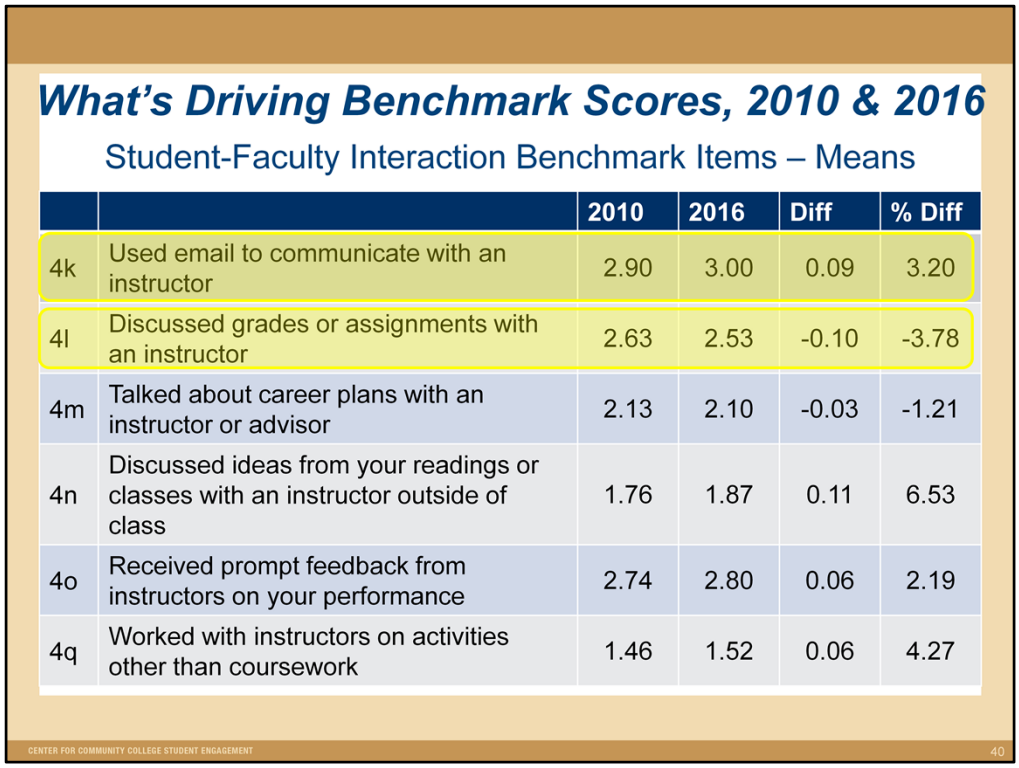
For this example, let's look at the means scores for items in the student faculty interaction benchmark.
Here we see changes from 2010 to 2016 (end-points only). Earlier we saw that the student-faculty interaction raw benchmark score showed a small, generally upward trend from 2010-2016.

So what do we see here? ⏭



		2010	2016	Diff	% Diff
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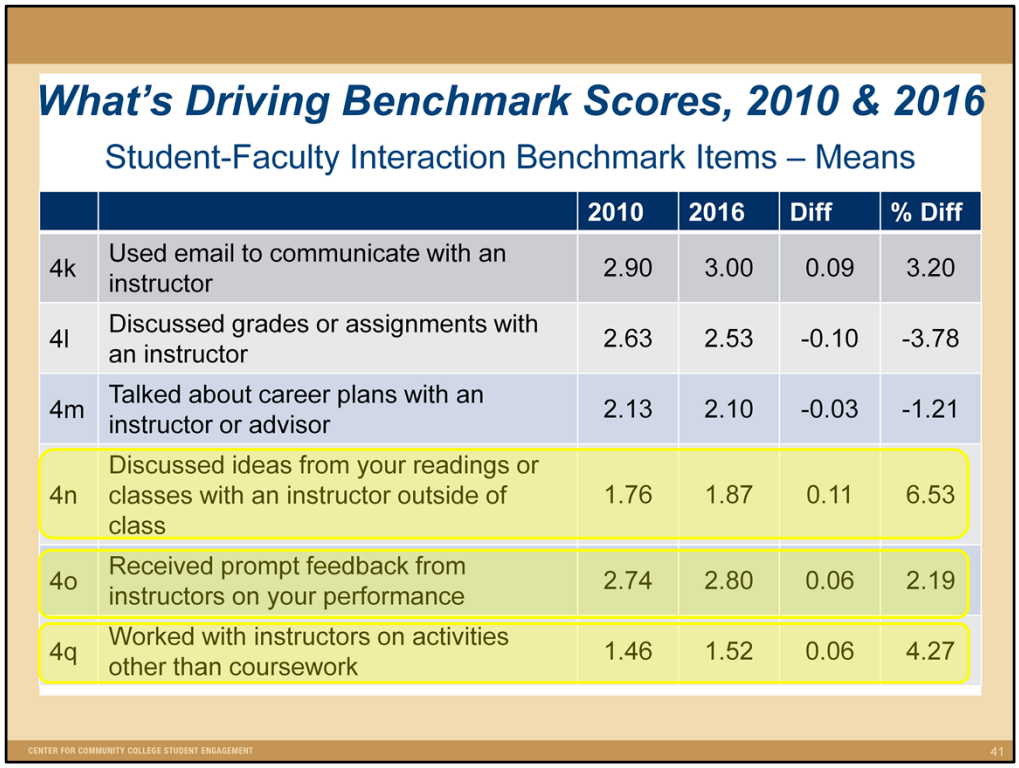
The change in mean scores for the first two items off-set each other. ⏭



		2010	2016	Diff	% Diff
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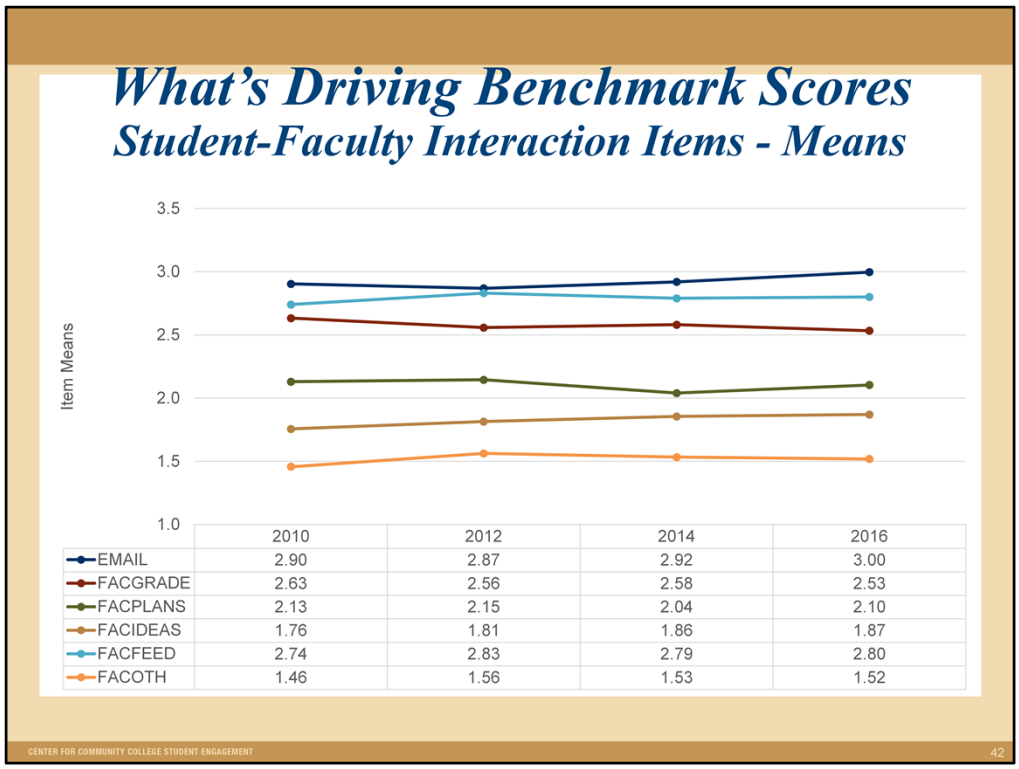
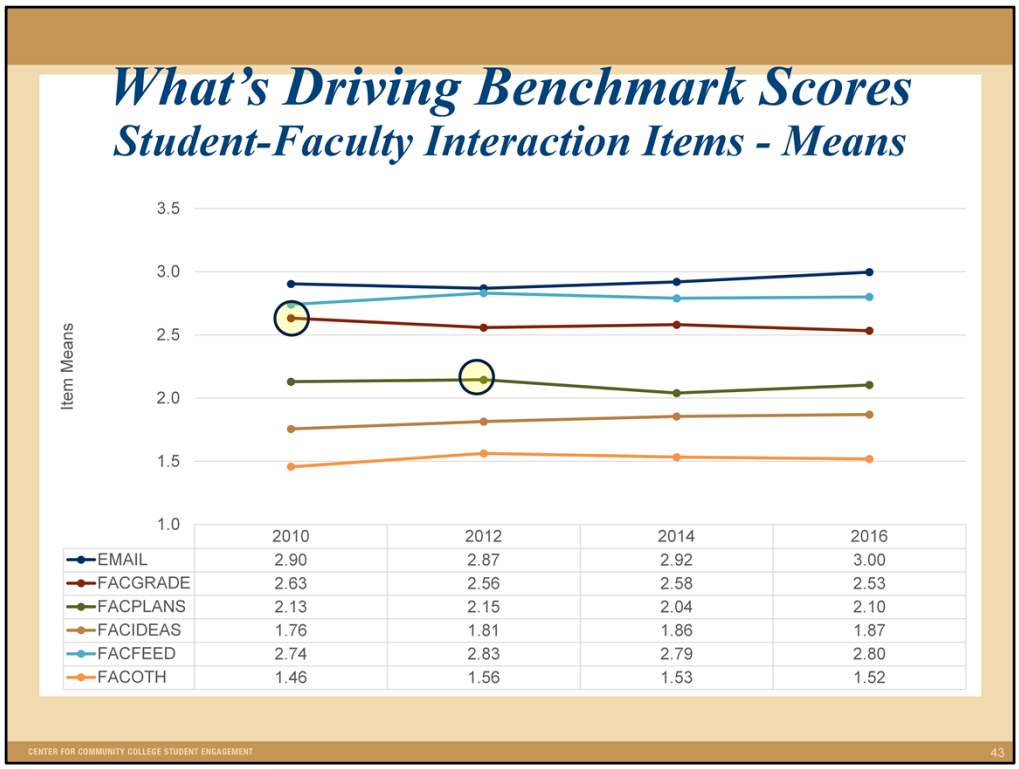
The last three items, however, are all positive which contributes to the overall positive trend in the corresponding raw benchmark score. In looking at the end point, we see there were substantial changes in the means of several items from 2010 to 2016. But what happened between these years? ⏭



This graph shows some fluctuations in the means over time with some increases and some decreases. One thing to note here is that the high point is not always at an end point. For example, look at FACGRADE (4n) (the red line) and FACPLANS (4m) (the green line.). ⏭



Both of these showed negative change from 2010 to 2016, but their high points were in 2010 and 2012, respectively. Granted, these fluctuations were so small that the year-to-year changes are possibly due to chance.

Now that we have looked at how the means here are driving the benchmark score, the next question is: What's driving the means?

To answer this question, we turn to the frequencies. ⏭

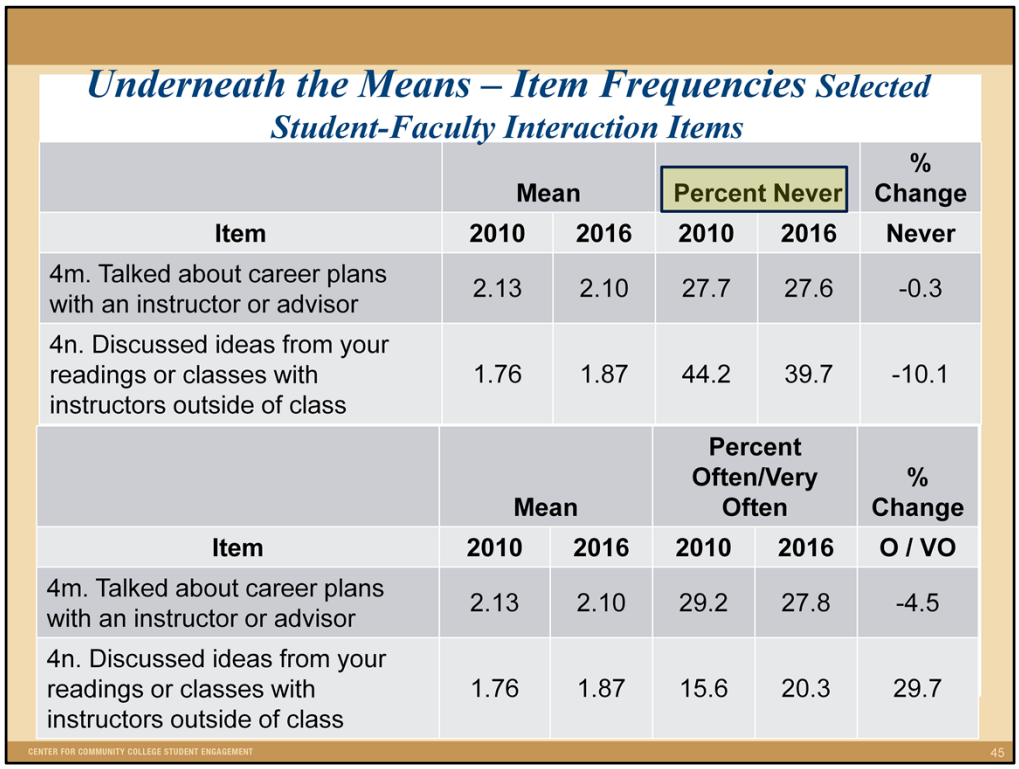
Underneath the Means – Item Frequencies Selected Student-Faculty Interaction Items

	Mean		Percent Never		% Change
Item	**2010**	**2016**	**2010**	**2016**	**Never**
4m. Talked about career plans with an instructor or advisor	2.13	2.10	27.7	27.6	-0.3
4n. Discussed ideas from your readings or classes with instructors outside of class	1.76	1.87	44.2	39.7	-10.1

	Mean		Percent Often/Very Often		% Change
Item	**2010**	**2016**	**2010**	**2016**	**O / VO**
4m. Talked about career plans with an instructor or advisor	2.13	2.10	29.2	27.8	-4.5
4n. Discussed ideas from your readings or classes with instructors outside of class	1.76	1.87	15.6	20.3	29.7

On the previous slide featuring graphed item means, we saw that the means for most of the items within the student faculty interaction benchmark indicated positive trends… but that doesn't really tell the whole story. Looking at the item frequencies can reveal more information about how students are engaging in different behaviors.

To simplify the presentation of frequencies, it may be practical to dichotomize the response values; otherwise, it would be very difficult to present multiple items in an audience-friendly manner. ⏭



The items on the student-faculty interaction benchmark all use the same response scale: Never, Sometimes, Often, and Very often. Since Never is the only absolute value in this scale, we often will dichotomize on Never vs. Ever ⏭

Underneath the Means – Item Frequencies Selected Student-Faculty Interaction Items

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Another option, though is to dichotomize combining often and Very often vs never and sometimes. Different breakouts of the data can provide valuable and interesting information about student behaviors.
In this slide we've chosen two items that have trends changes at the extreme ends of the response categories. ⏭

Underneath the Means – Item Frequencies Selected Student-Faculty Interaction Items

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Focusing on item 4m (FACPLANS)– Talked about career plans with an instructor or advisor**.** There was a 1.21% decline in the item means from 2010 to 2016. Examining the frequencies, we see there was essentially no change in the number of students who reported they never engage in this activity (3-tenths of 1%). However, looking at the number of students doing this often or very often, there is a 4.5% drop. So, while there was essentially no change in the number of students not engaging in this activity, it appears to be happening less frequently among those who do talk about career plans with an instructor or advisor. This would lead to the small decline in the mean for this item. ⏭

Underneath the Means – Item Frequencies Selected Student-Faculty Interaction Items

	Mean		Percent Never		% Change
Item	**2010**	**2016**	**2010**	**2016**	**Never**
4m. Talked about career plans with an instructor or advisor	2.13	2.10	27.7	27.6	-0.3
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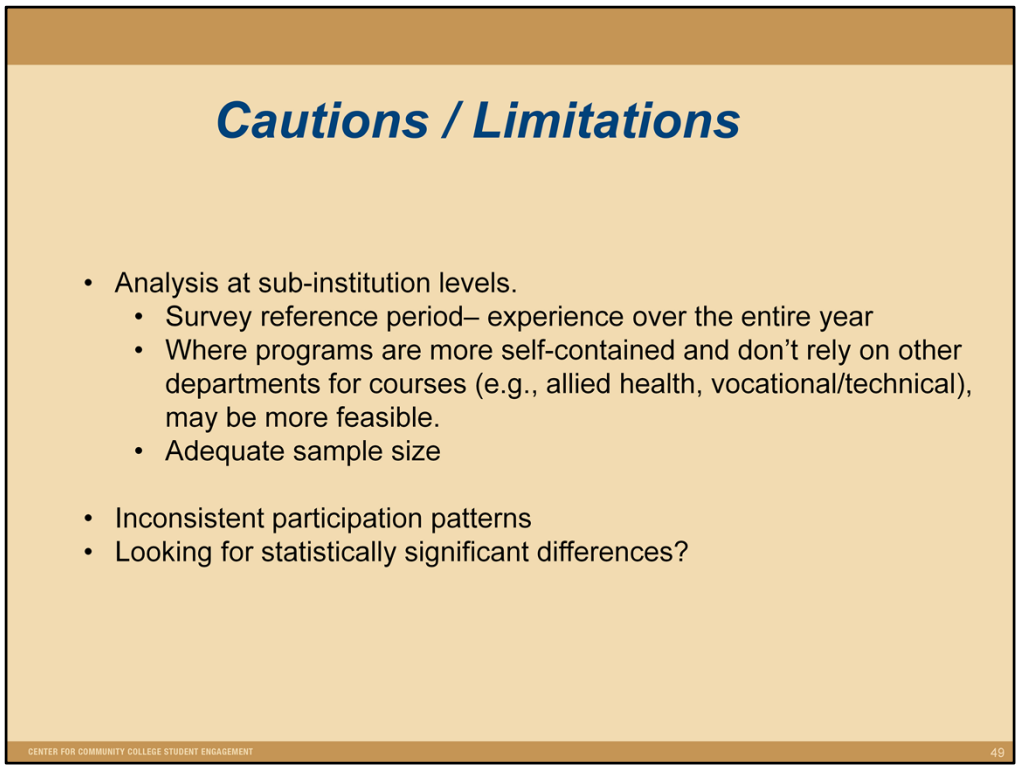
Turning now to item **4n** (**FACIDEAS**) - Discussed ideas from your readings or classes with instructors outside of class, we saw a 6.5% increase in the mean score. The frequencies reveal that the number of students who reported never engaging in this activity declined by about 10% which would, in and of itself, increase the mean score on the item. In addition, the number of students who reported doing this often or very often also increased by almost 30%. These two changes help explain why the mean for this item increased: not only are more students engaging in this activity, but students are doing it more frequently. ⏭



So we all ready to jump into analysis of Center data over time? Well, before we go there, we should discuss some important limitations.

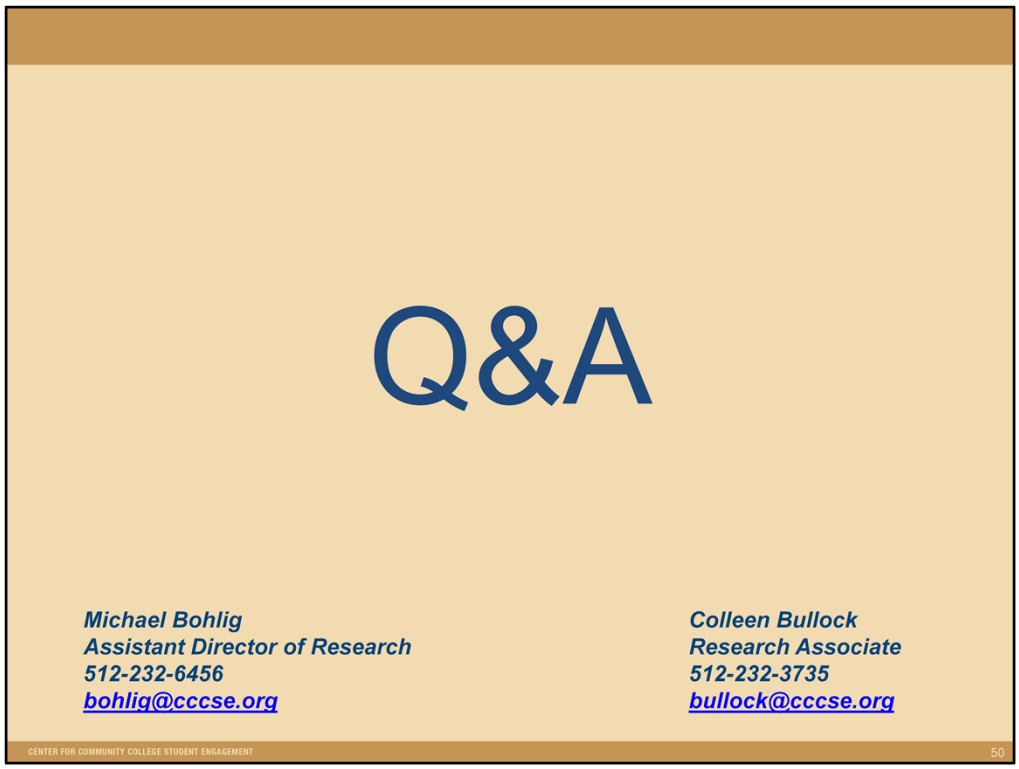
Many colleges are interested in analyzing *CCSSE* and *SENSE* data by program areas, departments or other sub-institutional levels. Remember, the survey was designed as an institution-level survey; Students are asked to respond to questions on *CCSSE* about the overall experience for the entire academic year. This means that students are considering their experiences in developmental courses, history courses, English courses, chemistry courses, biology courses etc. This means that if a student had a particularly poor experience in a course or a particularly spectacular experience, that could influence their responses.

The primary sampling procedure is designed to draw a sample that is representative at the institution level. As such, samples within sub-units of the college may not be adequate to be representative of a given sub-unit. In some cases (e.g., allied health programs, and perhaps vocational-technical programs) where the programs are mostly *self-contained*, oversampling may help increase the number of respondents to provide an adequate sample.

If your college has had very inconsistent participation patterns, especially if there were large gaps between administration years, interpretation of change over time should be undertaken with caution. Factors such as overall population changes or changing priorities may have an unexpected impact on survey results.

Finally, if you are hoping to find statistically significant results over time, remember that while there may be several hundred surveys per administration, almost none of the survey respondents will be the same from one administration to the next. As such, you effectively have a sample of one. Your best bet here is to look for substantively significant changes in your data rather than statistically significant.

At this time, we would like to entertain any questions you may still have.



If there are no further questions, we will close the webinar at this time. If you think of any additional questions, please don't hesitate to contact us.

Thank you for your participation.