My name is Dr. Frederick Burrack. I have been Director of Assessment at Kansas State University for 13 years. With me is Dr. Dorothy Thompson, Assistant Director of Assessment

I imagine that you have chosen to participate in this workshop because CANVAS has been selected as the Learning Management System at your institution, as it has been at my institution. Fortunately for us, CANVAS has a very effective assessment structure built within its technology. Unfortunately, there is limited guidance on using this technology beyond its use in courses.

This workshop is designed to help CANVAS users implement its full potential for student learning assessment processes. We want this be be interactive throughout, but with the large number of participants, your mics will be muted and interaction will occur through questions or issues that you type into the discussion board. I will have moderators help me keep track of your questions, so please ask them when they come into your mind.

There will be a lot of information provided in the workshop so the powerpoint slides will be made available with the narrative, so you don't have to take copious notes. As far as taking notes, what might be useful is for you note information you find useful as well as the slide number found on the bottom right of each slide. This session is being recorded and will be made available in short segments. This way you can access any part of the session according to topic for your use in the future. And although I will say this at the end, I am available at the website you see on this slide and happy to video conference with your institution in the future.

Goals of this workshop

Gain a thorough understanding of automaticity capabilities within CANVAS through:

⟹ exploring the structure of CANVAS (LMS),

⟹ learning how to set-up CANVAS to collect student achievement data for outcomes and associated criteria directly from coursework assessment,

⟹ understanding how to export data out of CANVAS,

⟹ experiencing options for using and visualizing outcome data that comes from CANVAS for use in decisions making.

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The goal for this workshop is for you to gain a thorough understanding of the data collection capabilities that align with learning outcomes through CANVAS.

       * We will explore the structure built into CANVAS (LMS),
       * You will learn how to set-up CANVAS so it collects student achievement data for outcomes and associated criteria directly from coursework,
       * You will learn how to export the data out of CANVAS,
       * And ways to display the outcome data for effective use in decisions making.
I will <u>not</u> be asking you to go into your institution's CANVAS. Much of what will be shared exists in the administrative portal. If you currently don't have access to this, understanding its capabilities will help you demonstrate the need for access and how to use it when it becomes available to you.
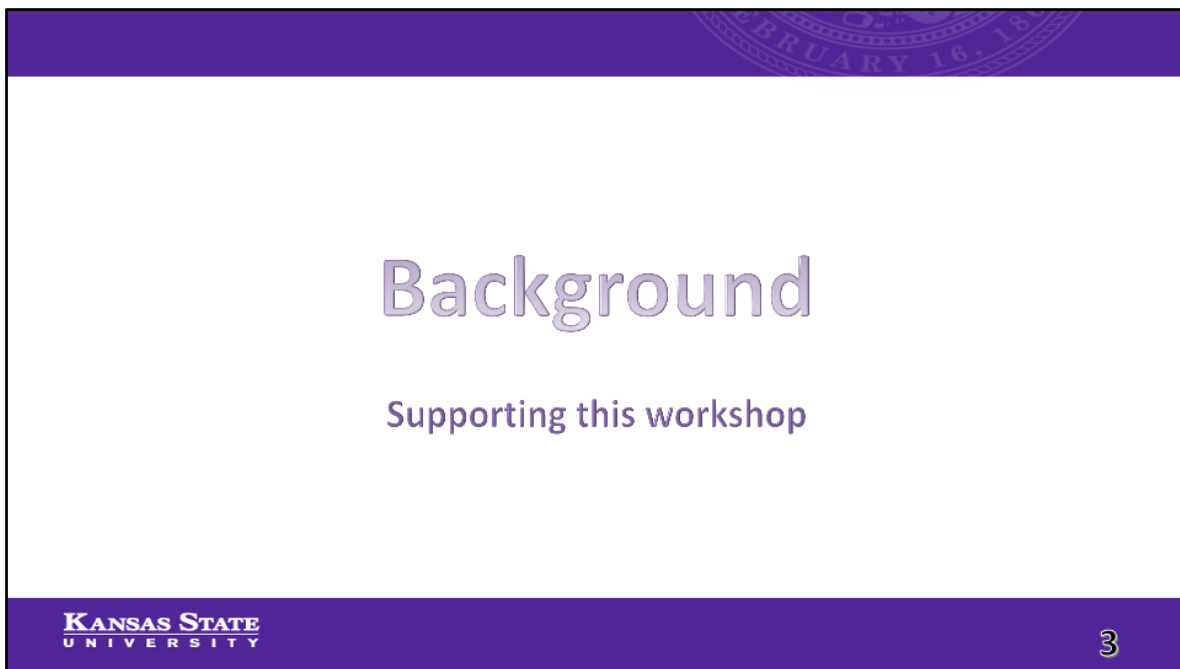
Before we more into the nuts and bolts of using CANVAS for automated student learning data collection, it is important that I share the assessment paradigm behind using CANVAS for data collection.

Paradigm for assessment

— Learning is best assessed through educational experiences through which students demonstrate indicators of achievement.

— Assessable learning experiences typically come from programs and co-curricular units within the institutions of higher education.

— Primary purpose of assessment is to expose aspects of student learning that could improved.

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Assessment processes at my institution, as well as nearly all institutions of higher education, reflect an understanding that: *
1. learning is best assessed through educational experiences through which students demonstrate indicators of achievement; (This is contrasting to an alternate paradigm that believes evaluation of learning occurs outside of the instructional process).
2. This paradigm recognizes that the ownership of preparation for and assessment of student learning resides with programs/co-curricular units;
3. And the primary value of assessment is exposing specific aspects of learning that can be used to guide improvement decisions.

Another important understanding is that technology alone will not fix an ineffective assessment process. Technology is a tool to facilitate efficiency through automation. Technology can collect, organize, and present information in ways to be understood and useful, and enable maintenance and analysis of data, but it is the tool for an effective assessment process.

The processes I will share could be used at any size institution, but it might be useful to know that my university is a large research institution. The assessment started without CANVAS in 2004 in response to regional accreditation expectations.
- Our assessment structure is designed around each program and co-curricular unit defining the
- the expected learning of program degree completion and co-curricular unit mission.
- Assessment measures are specifically aligned with the defined outcomes to indicate the quality of student learning.

Direct connections to curriculum

	Intro Course	Research Methods	Advanced Concepts	Laboratory	Advanced Techniques	Capstone / Practicum
Knowledge						
SLO 1: Disciplinary knowledge, models and theories.	Introduce		Reinforce		Reinforce	Mastery/Assessed
SLO 2: Disciplinary methods		Introduce				
Critical Thinking						
SLO 3: Analysis and use of evidence.		Introduce	Reinforce		Reinforce	Mastery/Assessed
SLO 4: Evaluation, selection, and use of sources.			Introduce	Reinforce	Reinforce	Mastery/Assessed
Communication						
SLO 5: Written communication Skills	Introduce	Reinforce		Reinforce	Mastery/Assessed	
SLO 6: Oral Communication Skills		Introduce	Reinforce		Mastery/Assessed	
Integrity / Values						
SLO 7: Disciplinary ethical standards		Introduce		Reinforce	Reinforce	Mastery/Assessed
Diversity / Teamwork						
SLO 8: Interpersonal skills			Introduce	Reinforce		Mastery/Assessed

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The process applied at our institution involves identifying where, in the curriculum, each outcome is introduced, developed, and at what point the student is expected to demonstrate program completion competence of each outcome. This work is typically demonstrated through a matrix like you see on this screen.

The program or co-curricular unit defines the assessment tasks through which the students demonstrate successful learning achievement, which are embedded in the curriculum.

The process looks like this:
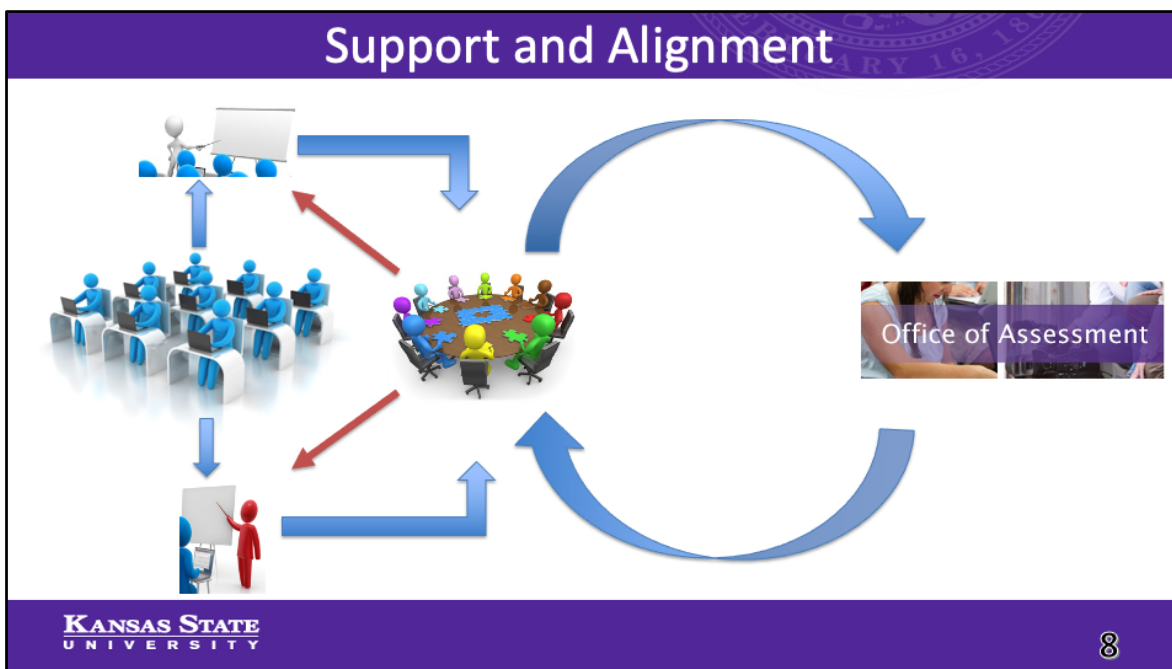
- Each assessment task is intentionally selected by faculty from coursework and educational experiences. Students demonstrate degree-credentialing competence within the curriculum process.
- Achievement data is collected through CANVAS learning outcomes and annually reviewed by the program faculty to provide feedback for instructional and curricular decisions. Student learning needs that are exposed from programmatic discussion * are communicated to faculty with suggestions for curricular and instructional adjustments.
- Annual assessment of student learning reports are submitted to the institutional Office of Assessment for * feedback to enhance the assessment process and providing guidance on improving validity and reliability of the measures.

It is within this process that CANVAS becomes a useful tool.
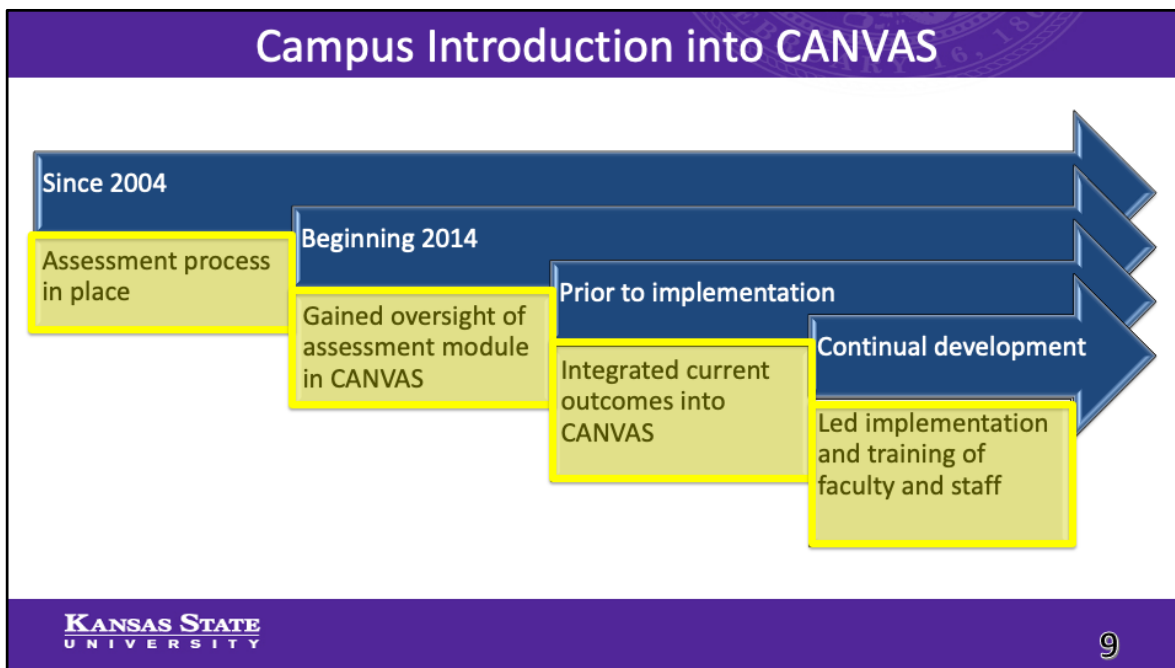
One final bit of background information before we more into learning the structure of CANVAS assessment technology:

- It is important for you to know that the process I just described was already in place when our institution started using CANVAS for collecting student achievement data. Our assessment process began in 2004 but CANVAS was integrated in 2014. CANVAS is only a tool to assist the assessment process and not the process itself.
- In 2014 when our university began piloting CANVAS as a Learning Management System, the IT area was not planning to implement the assessment component in its initial implementation, but the Office of Assessment intentionally and actively pursued oversight for program development and implementation of the assessment module. We didn't want the faculty to learn how to use CANVAS one way and then to make assessment an add-on later. We wanted assessment of learning integrated in CANVAS right from the start.
- To facilitate a seamless integration, the Office of Assessment pre-populated each program's learning outcomes into CANVAS so when programs and their faculty began using the LMS, outcomes from the current assessment process were ready to be aligned with assessments for immediate collection of student achievement data.
- The Office of Assessment led the professional development for faculty and staff over several years to gradually integrate the technology within our current assessment processes.

The process that we will explore today does not happen over night and will require multiple steps of develop. But it works very well and has been accepted across our campus. Are questions at this point before we move into learning about the structure of CANVAS assessment portal.

The foundation of using CANVAS' assessment technology is understanding its structure.
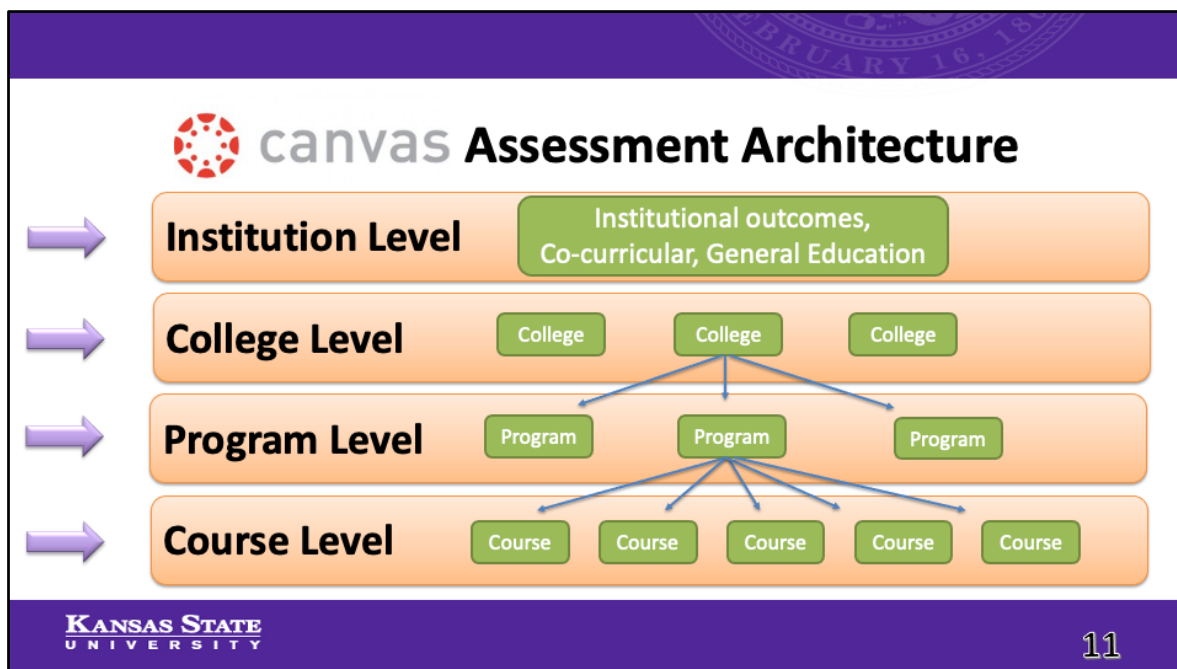
The structure of CANVAS LMS is in a hierarchy.
- The facing layer into which the faculty interact is the course level. In this course level, faculty interact with students by sharing documents, scheduling instructional sequences, creating assignments, placing scores in a grade book, and many other aspects associated with teaching their course. This level is where student achievement for outcomes can be collected, but this is **not** the layer where the outcomes exists.

The layers above the hierarchy are accessible through administrative access:
- (a) the program level connects all of the courses that are under the program's oversight;
- (b) the college level connects all of the program within the college; and
- (c) the institution level that connects all of the colleges as well as any unit that is broadly administered across the institution.

Understanding this hierarchy is essential to effectively implementing the assessment module for automating data collection.
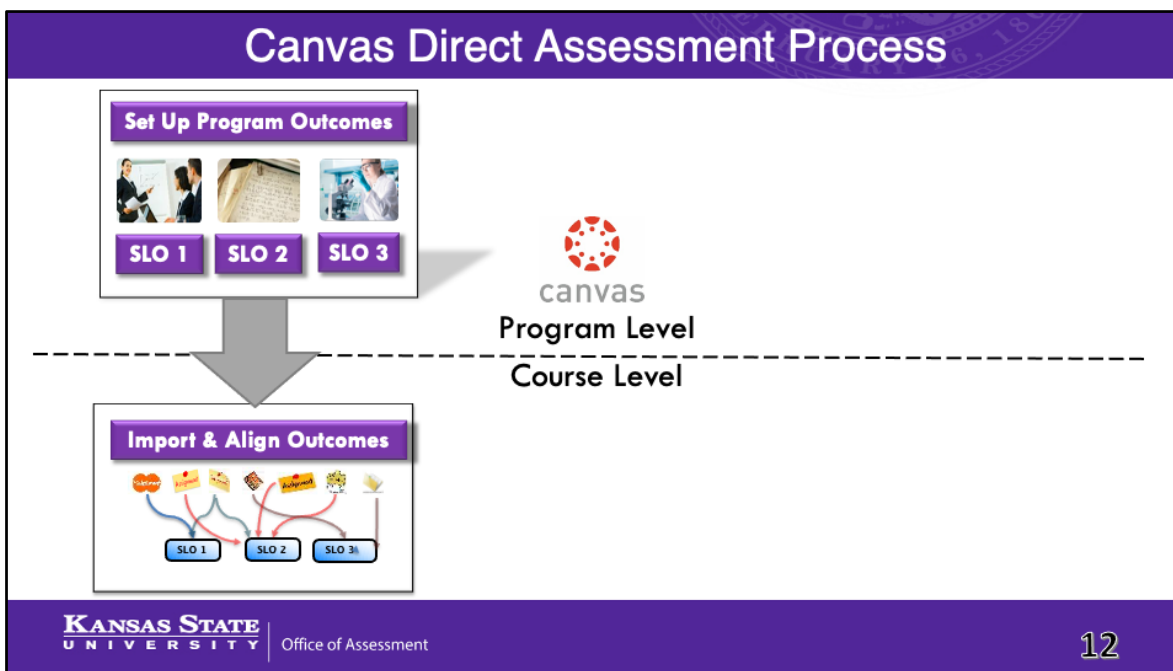
An understanding of the hierarchy is fundamental in outcome assessment in CANVAS. **The level in which an outcome is created is where the achievement score is retrieved**. A construct to understand is that an outcome in CANVAS can be used by any group in and below the level where the outcomes is created, but it will not be accessible to a level above.

- As an example, since much of our university assessments structure is focused around program outcomes, this is where the program outcomes are created.
- The outcomes are brought into the courses to score student demonstration of expected achievement.
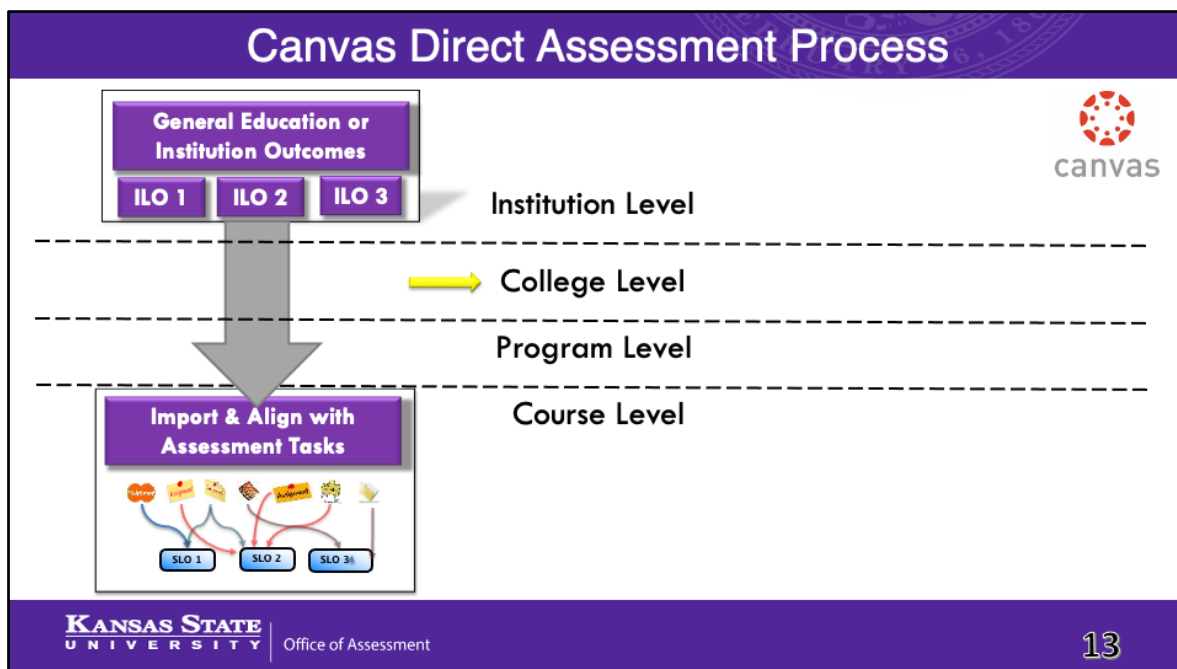
Beyond the program level, if a college uses common outcomes across their programs,
* then these outcomes should be created at the college level to make them available
for use in courses that are within their purview.
- Extending this construct more broadly, if outcomes are to be assessed in courses
  across the entire institution,
- then these outcomes are created at the institutional level so to be available to all
  courses.
Similarly, since co-curricular units often involve students across the institution, their
outcomes would also be created on the institution level. In general, the hierarchy
defines who will have access to the outcomes to be imported into a CANVAS course
for use in scoring student achievement.
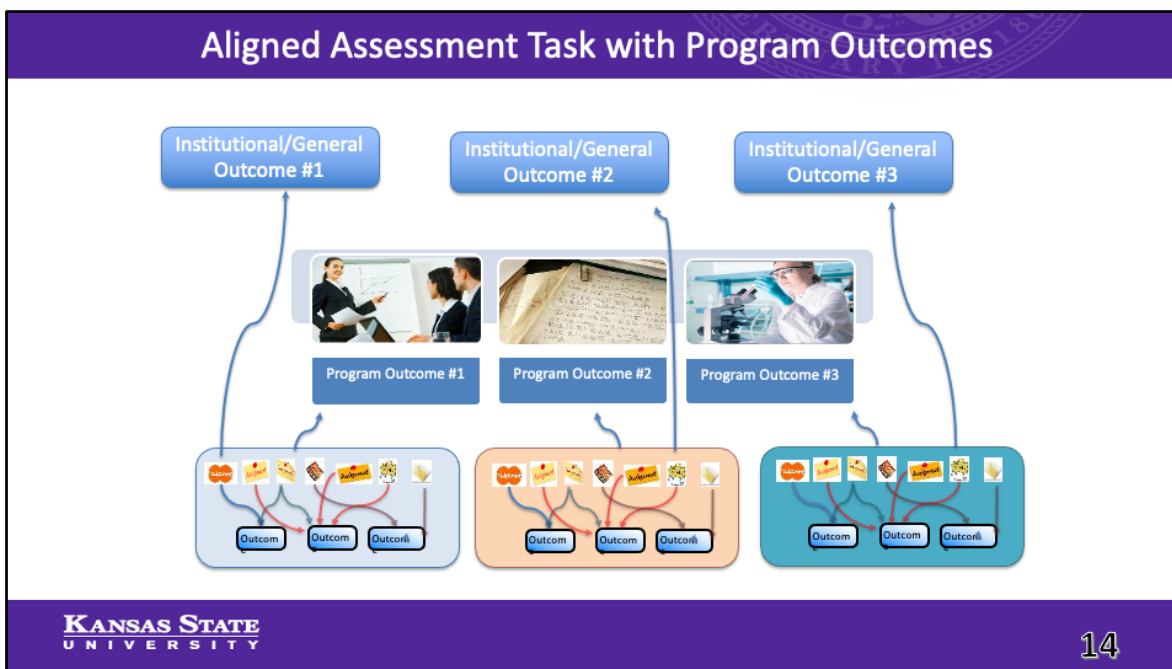
Since achievement data in an outcomes assessment process are intended to be aggregated and analyzed beyond individual courses, the highest level at which aggregation occurs is where the outcome should be created in the technology. Having a well-designed assessment process is important in order to use CANVAS to its fullest potential.

Before I show you what this looks like in CANVAS, are there any questions up to this point that need a response?

The process for creating outcomes in CANVAS is the same at all levels.
One thing that is essential for those creating the outcomes is to have access to the
program/college/institutional area into which the outcomes will be hosted.

Course instructors already have access to their courses. But those that oversee the
broader assessment will need administrative access. Your institutions IT group that
oversee the CANVAS technology on your campus can provide individuals access to
specific access points.

- When administrative access is given to individuals for their particular area, an icon
  that looks like a key on a shield will be visible at the top of the left access panel on
  the CANVAS page . Once you receive access to the specific program/unit level for
  which outcomes will be created,…
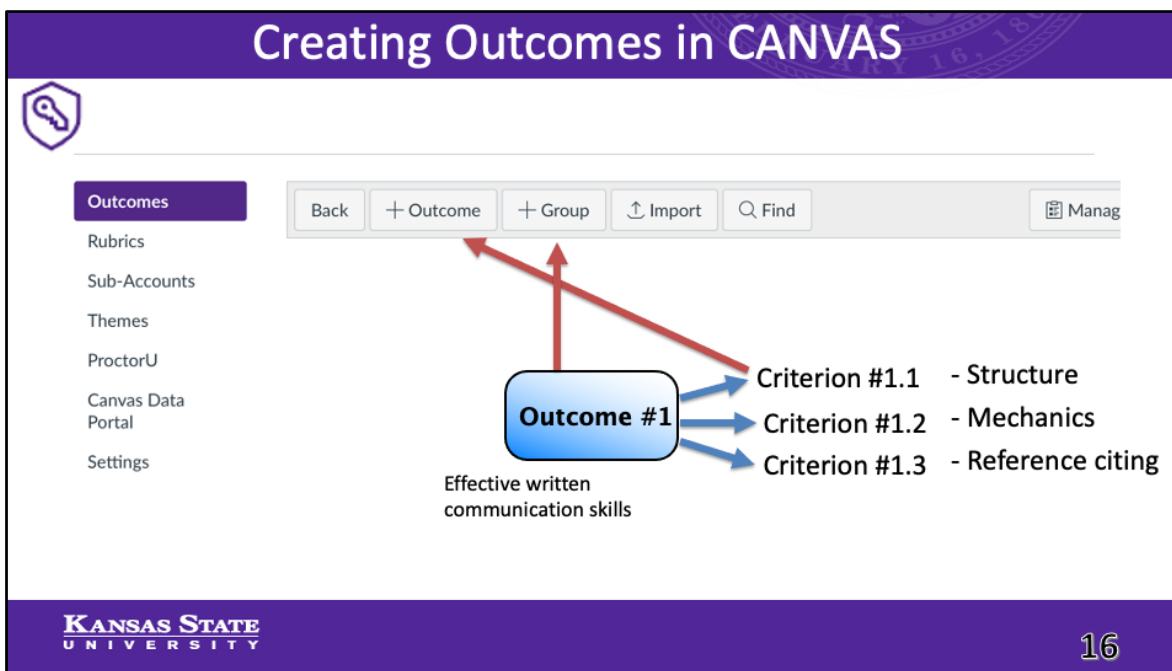
The outcome button on the left side of the page will open the outcome creating page. This page will be empty unless outcomes have already been created.
One of the most important constructs to understand is a difference in terminology used by CANVAS as compared to the meaning understood by most assessment processes.
- When the term 'Learning Outcome' is referred to in an assessment process, it usually means a specific category of learning.
- And in assessment lingo, each time an outcome is assessed, that outcome is usually comprised of multiple criteria that provide indicators of achievement. These criteria are often seen as part of a scoring rubric or individual questions on an exam.
- For example, an outcome that states "Students will be able to communicate effectively in writing", this usually is comprised of multiple criteria that are assessable such as:
- 'Structure is clear, logical, and easy to follow', 'Uses correct mechanics such as grammar, spelling, and punctuation', 'Effectively incorporates appropriate supporting materials', etc. In CANVAS, the criteria are what CANVAS calls Outcomes. These are the components that are scored in an assignment.
- What a typical assessment process calls an outcome is called a Group. In CANVAS, we create a Group (outcome folder) for each of the outcome categories
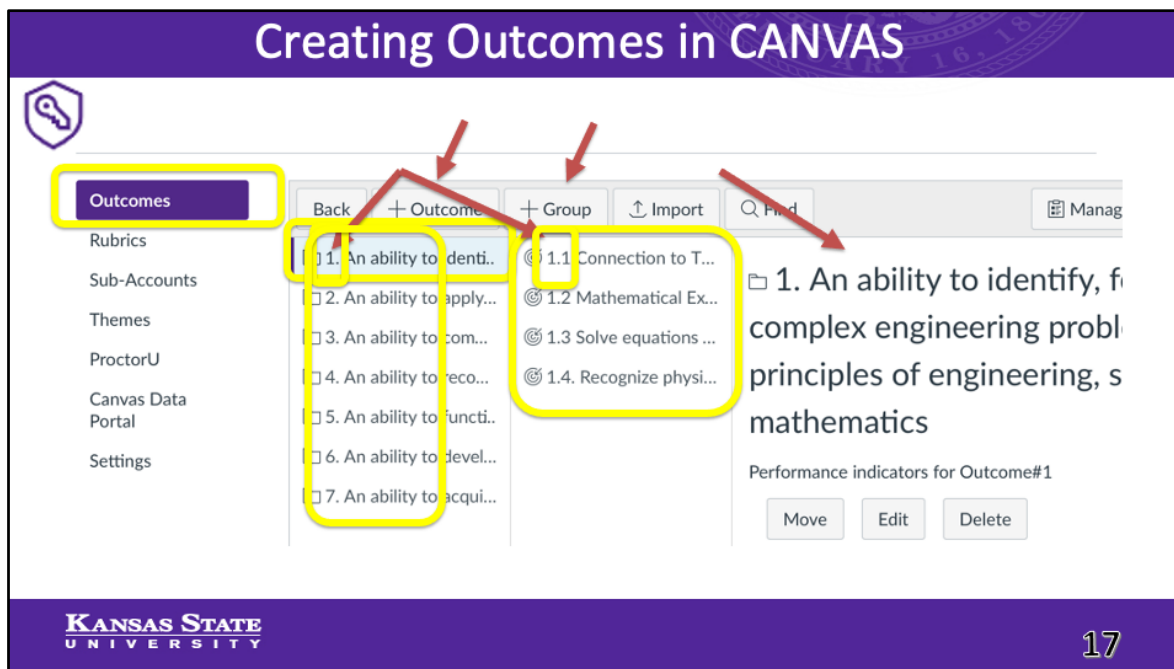
As an example, this is a screen shot from CANVAS. It comes from the administrative portal of an Engineering program but would look similar to any outcomes page at the college or institution level.

- After opening the outcome window,
- the best strategy would be to create a folder for each of the program outcomes using the group button. As I mentioned previously, what most of us call Outcomes are considered groups in CANVAS. Think of these as folders of assessable criteria that are used as the indicators of student achievement.
- Inside of each folder are the assessable criteria that CANVAS calls outcomes.
- These are created with the Outcome button.
- In CANVAS, by using the GROUP folders to organize criteria outcomes, we can design an assessment structures as granular as we want because we can create organizing folders inside of folders.
- For sorting and filtering purposes, we find it best to use a numbering system. When a program is accredited, the number system often comes from the accreditation expectations. This structure becomes a valuable aspect for aligning the data to accreditation reporting expectations. Even when a program is not accredited, the numbering system makes organization during analysis easier.
- Another thing we have discovered is an importance to keep the name of the Groups and Outcomes short with the descriptive words at the beginning. You notice the challenge in this example. When a window truncate titles, they all look the same when each begins with "An ability to…". This is something we discovered in the process.
- A full description can be placed in outcome statement textbox provided and is available in the data export for use in reporting.

When creating an outcome, defining the levels of differentiated achievement is important. An outcome (*remember in CANVAS that the word OUTCOME refers to each criterion that is assessed in an outcome category or Group*). It is important that there is clear categorical differentiation of achievement so multiple scorers can reliably use the scoring device with assignment tasks. The description of each level defines the rigor expected for the Outcome (criterion).

- The description provided for each category is dependent upon its use in a scoring device. In most cases, students, as well as the scorer, will see the description so clarity of expectations is important. These descriptors of expected achievement might be designed to reflect a single assessment task, but it is equally as likely that the criterion will be used across multiple assignments. Decisions on appropriate wording is important as it cannot be edited when imported a class. As far as the point values, they are numerical indicators of an achievement level and not necessarily the points used in grading. Grading is done on the course level. I will explain how this aligns in a course a little later in the workshop.

- You **will** need to set a Mastery score. Note that mastery in CANVAS does not mean perfection. It means the level that fully meets the rigor of achievement expectation.

- There could be a level beyond meeting expectations where a student exceeds the expected achievement level. If a level of exceeding expectations is used and appropriately scored, this level is used sparingly. We have found that the exceeds expectations level is sometimes confused with the grading process of A – B – C – D. Some programs consider these achievement differentiations like the do grades. Others consider exceeds as 96% or higher with meeting as below 96% to a particular percentage of achievement somewhere around 80%. Each program understands their own grading process as compared to how they gain the most information about outcomes achievement.

- Thinking ahead to analysis, we have found that it useful that all outcomes in a program's process to use the same number of achievement categories. This consistency makes it easier to understand and compare achievement across outcomes.

- When creating outcomes, below the achievement differentiation is a selection for Calculation Method. Our university usually selects 'Highest Score'. CANVAS keeps track of every score that is obtained each time the Outcome is used so calculations we calculate achievement outside of CANVAS.

I have just shared a lot of information about creating outcomes. Are there any questions at this point that we should addressed before we move into creating common rubrics using these outcomes?

If there is an intent to use a common rubric made up of Outcomes (criteria), this should be accomplished on an administrative level (program, college, or institution) and not individually in courses.
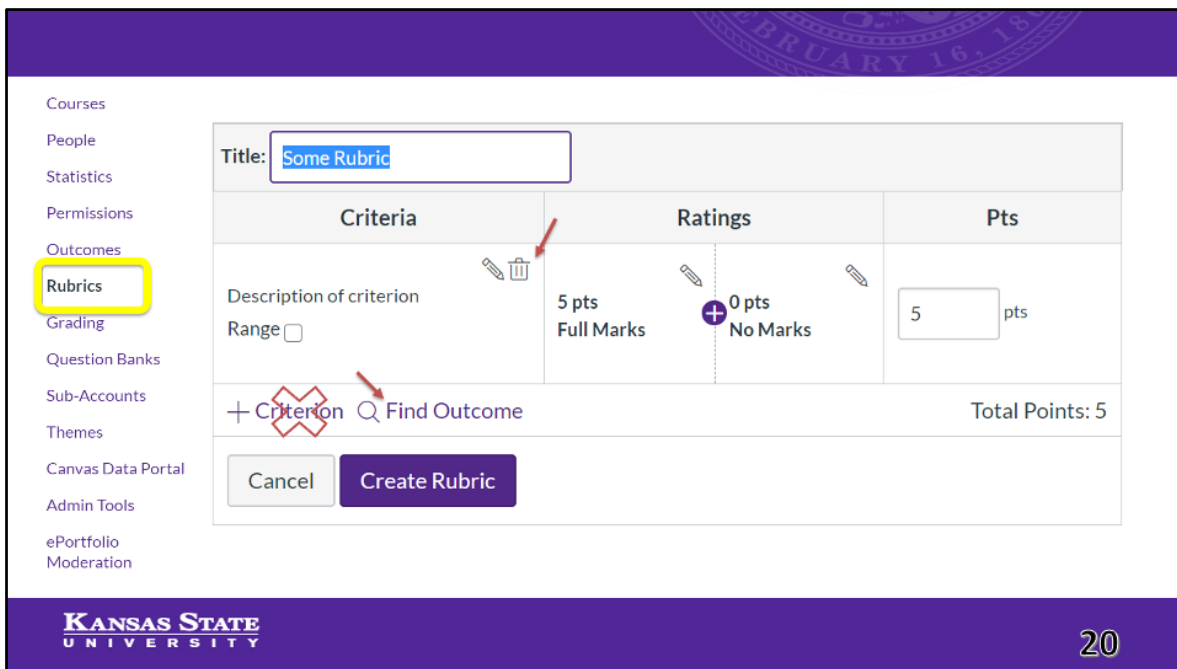
While in the administrative portal at either the program/college/institutional level,
- by selecting 'Rubrics' on the left ribbon,
- you can add a rubric and build it with Outcomes (criteria) using
- the 'Find Outcome' command.
- Do not use the 'Add Criterion' because what is created will not be outcomes so will not collect the scores.
- The sample criterion that is automatically provided should be deleted because it also will not be an outcome.
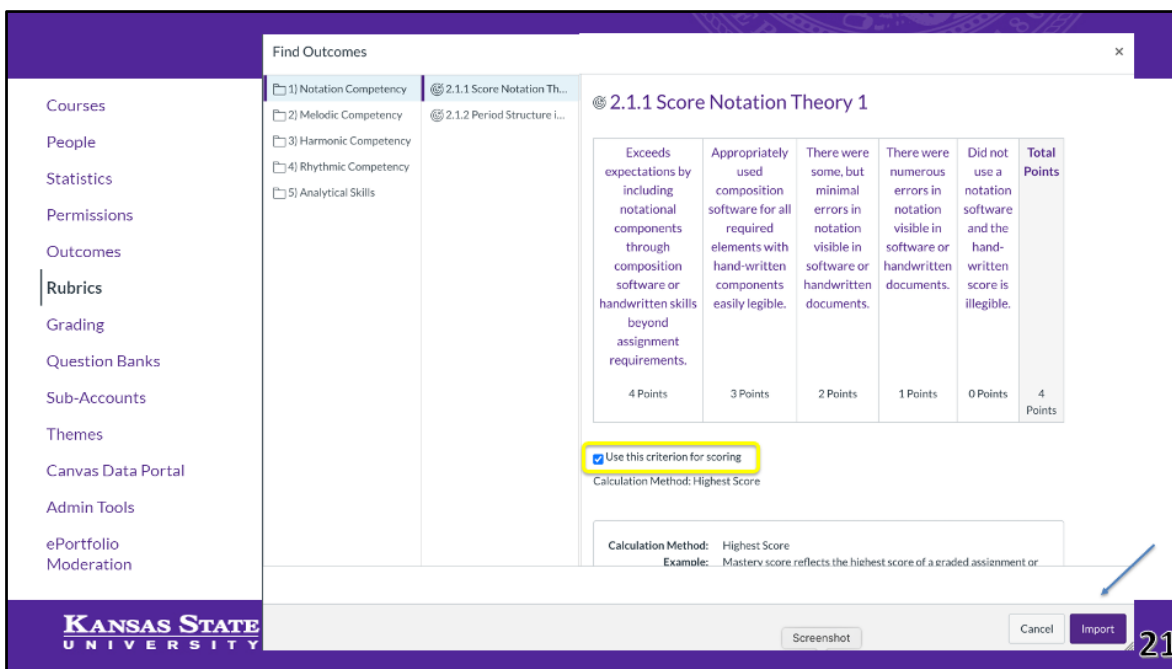
When you select "Find Outcome", a window will appear with all of the outcomes that are available from which you select the criteria to be imported into the common rubric. When you click on the chosen outcome, leave the "Use this criterion for scoring" checked and import the criterion. You can add as many criteria that you want to be in the common rubric.

Rubrics that are created in the program, college, or institutional level can be brought into a course assignment to be used in its entirety. But faculty also have the opportunity to selectively remove criteria that does not fit the particular assignment. They may also add additional rubric lines to be used in scoring. When the common rubric is used for scoring, each criterion score will be automatically collected at the level where the outcomes were created.

- The target icon at the beginning of a criteria line indicates that this is an outcome that will collect scoring data.

Using pre-created rubrics is an ideal way to utilize a common scoring device such as
- Value Rubrics, General Education Rubrics, or assessments co-curricular units. Each criterion is created separately as an outcome and brought together in a common rubric, which will be connected to an assignment or activity for scoring.
- Here you see an example. Our university uses the Institution level to create a common rubric to assess learning in our first-year experiences because these courses occur across every college.
- At the College level, this example comes from our College of Education that uses a common rubric to address licensure and accreditation expectations. The rubrics are used for portfolio scoring and internship scoring with all programs in the college using the common scoring device. The scores are automatically collected by the college and used within each program.
- At the Program level, the scoring devices used in a course or across multiple courses are created for automatic data collection.

Are there any questions about creating common rubrics on the administrative level?

Following a 5-minute break
- I will respond to questions added during the break.
- Then we will explore how to develop this process across a campus.
- And what faculty have to learn.

Before we move on, there are several notions I would like to reinforce:
- The first is the understanding that a well-defined learning outcomes structure is important. Without (a) thoughtfully defined learning outcomes, (b) assessable criteria that provide indicators of achievement, and (c) clarified differentiation for levels of attainment, the value of the CANVAS hierarchy would not be easily developed.
- In the process of learning to use CANVAS assessment portal, we have found that the process of programs and co-curricular units thinking through and defining what students learn has been the most valuable result of using CANVAS. Programs and units that did not understand assessment and were often most resistant developed into some of our university's champions of assessment. Academic programs came to realize that outcomes are not defined by what is being taught but by what student learn from and do with what is taught. Co-curricular units shift from counting attendance at activities they host instead to assessing what students learn from the activities. In nearly every instance, the most valuable result of implementing the CANVAS assessment technology were the discussions with and among the program and unit leaders.
- I often am asked how to get faculty/programs to buy-in to the process. I actually don't want to coerce buy-in with using this technology. What I want is for programs to implement an assessment processes that provides useful data for them to make decisions for improvement. I will show you the process that we use.
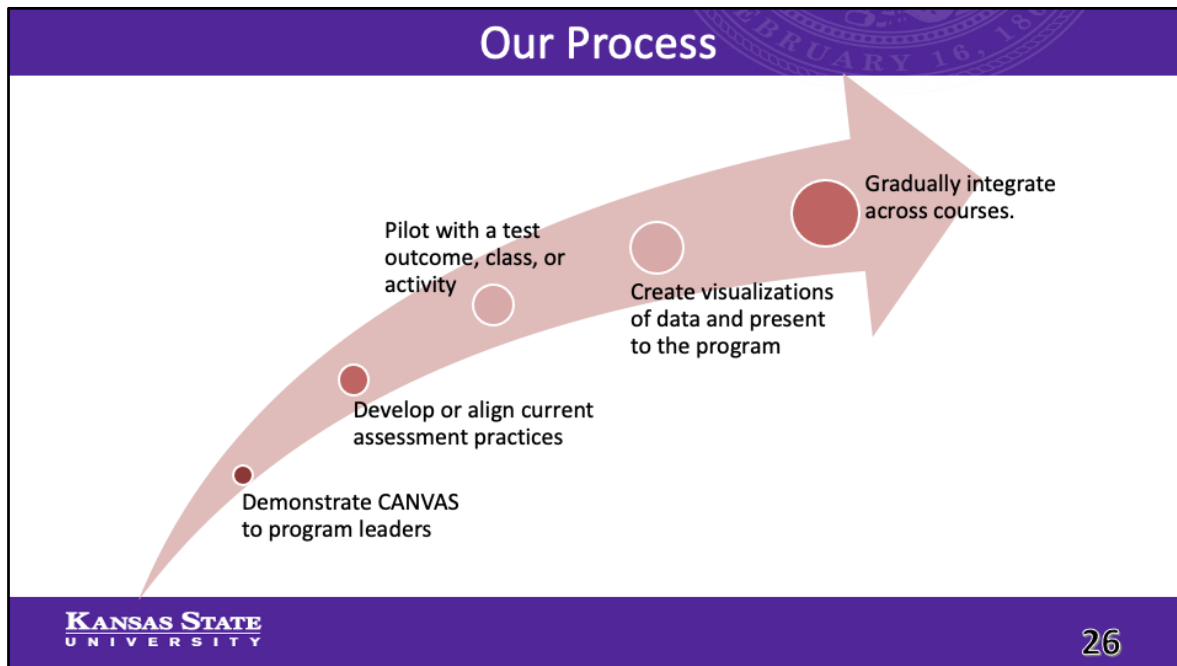
We usually begin with
- demonstrating to the program and units' assessment coordinator(s) the usefulness of CANVAS assessment technology. This is done by showing authentic examples from other programs or units emphasizing the flexibility of the technology and exploring how it might fit within their assessment processes.
- If outcomes and assessment plan is already designed and in place by the program, we give the assessment coordinator administrative access to create the Groups (outcome folders). Although some programs already have defined criteria with scoring differentiation, this is when current assessment practices are reviewed and discussed.

When the Groups (outcome folders) and the Outcomes (assessed criteria) are developed in the appropriate CANVAS level:
- we pilot the process in a class. We never bring CANVAS to the entire program without a pilot. The pilot is designed to work out the problems that may occur. We never want the faculty to run into challenges that could have been solved in advance. Through the pilot we also can develop authentic examples of success before initiating further implementation.

A typical timeline is to develop the Groups and Outcomes during one semester. A second semester pilots implementation and collects data.
- The data collected is visualized for assessment analysis to be used as an example for a demonstration to the entire program/unit at the beginning of the third semester.
- Then a gradual integration is developed across the program/unit's assessment process.

We have found success with this process and continue to see faculty and programs/units enhance their assessment processes.
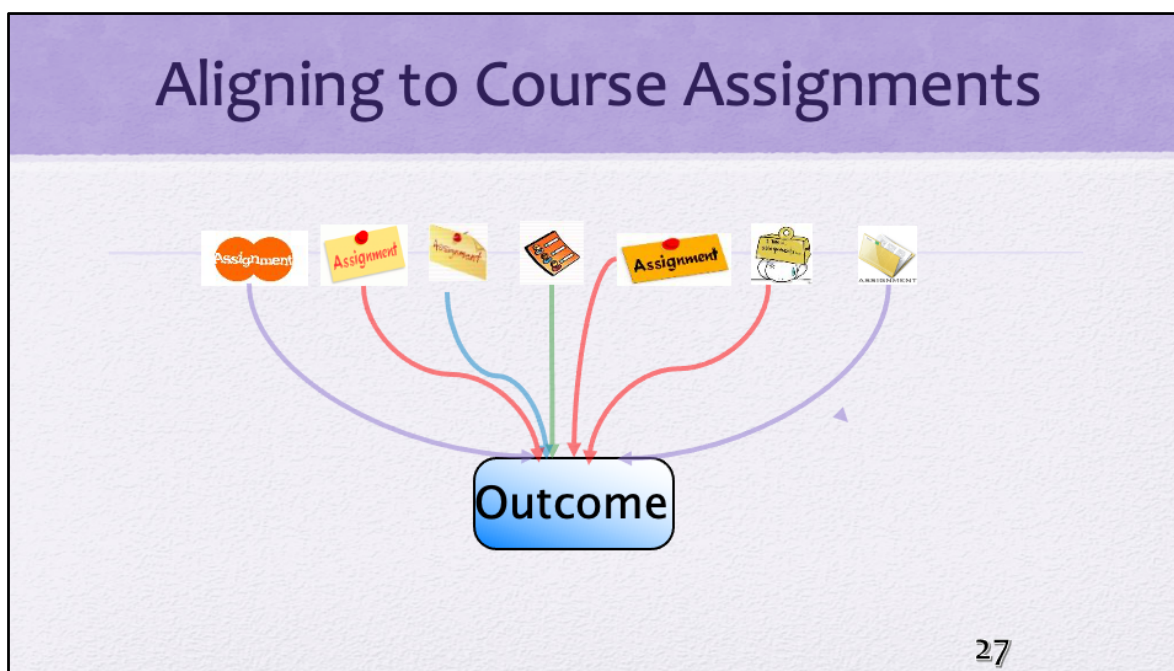
Now let's discuss what this looks like in a CANVAS course, (whether this is a scheduled academic course or a created course that has been aligned with a program/unit). The Outcomes (remember that these are the assessed criteria) can be integrated into whatever is used in CANVAS to score students' attainment of the desired outcome. I'm not going to show the process of how to create the variety of assignments that can be created in CANVAS because as there are many online tutorials to do so. But there are a few important steps in aligning an outcome that are important to know.
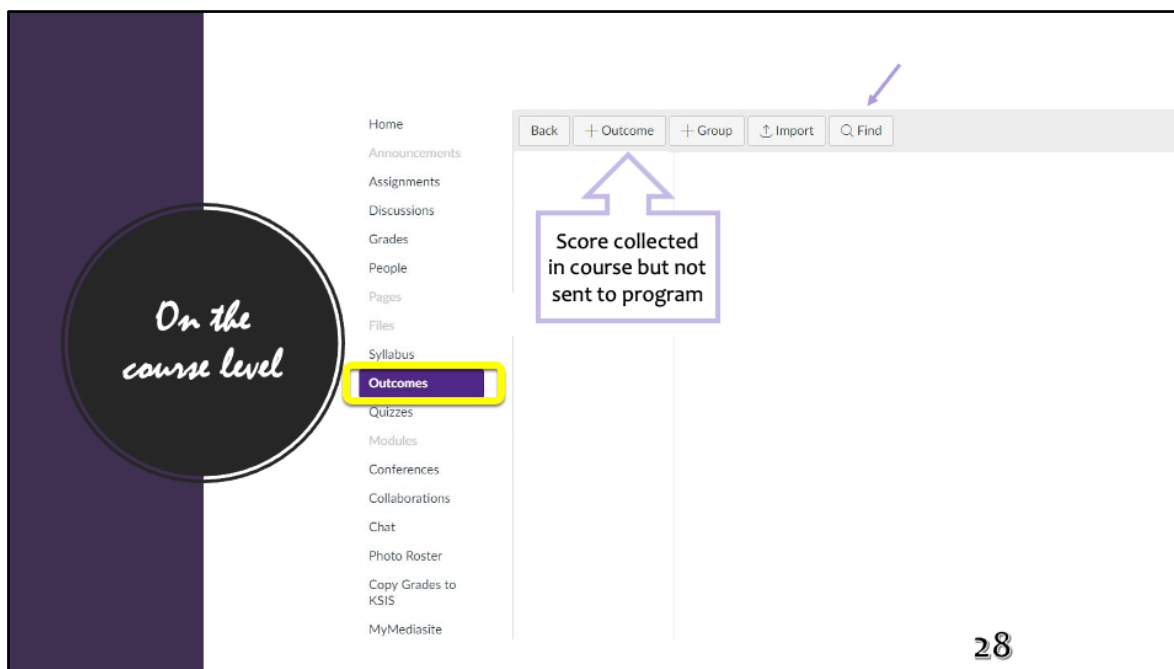
There are two ways of bringing outcomes into courses. The way with the most flexibility is to import each outcome individually to be aligned to an assignment.
- This is accomplished by selecting the 'Outcomes' button that is in the left ribbon on the CANVAS page. When the outcomes panel opens,
- the command to use is ' Find'.
- You will not use the '+Outcome', '+Group", or Import because what is created at the course level will not be tied to a level outside of the course itself.
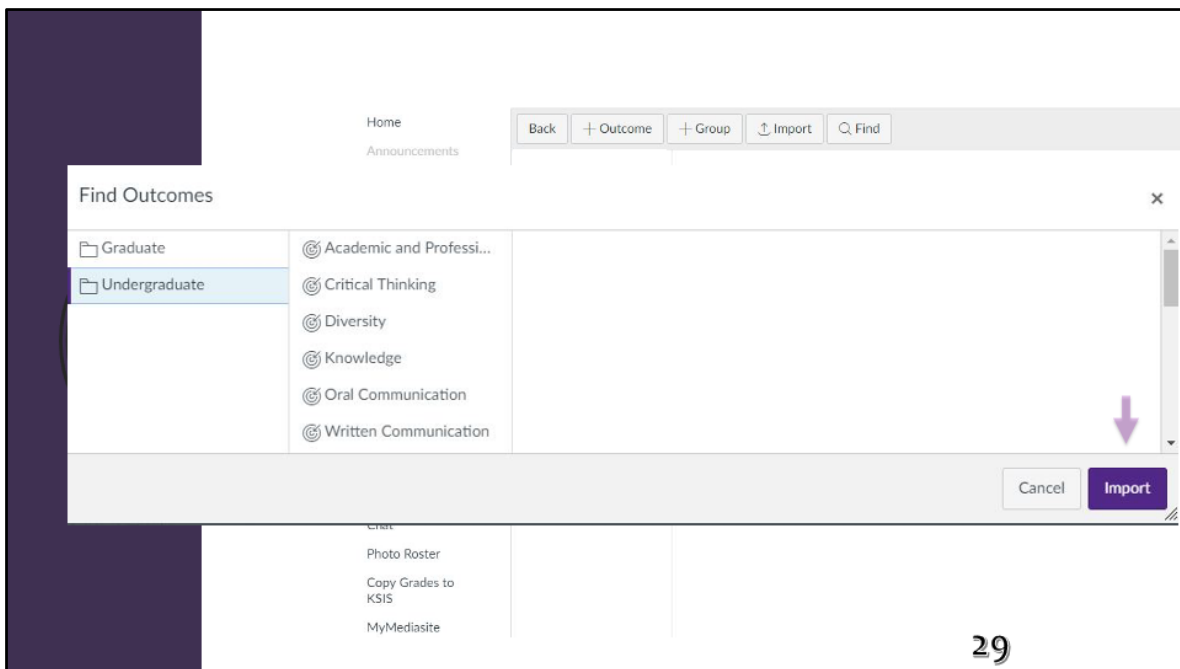
When ' Find' is selected, this will bring up the outcomes that are available from the associated Program/College/and Institution level.

- Each selected outcome can be imported individually into the course. The next step is aligning the imported outcome to an assignment.

A faculty member may bring in as many outcomes as are intended to be assessed in the course.
- Each outcome can be aligned with a scoring device in an assignment.
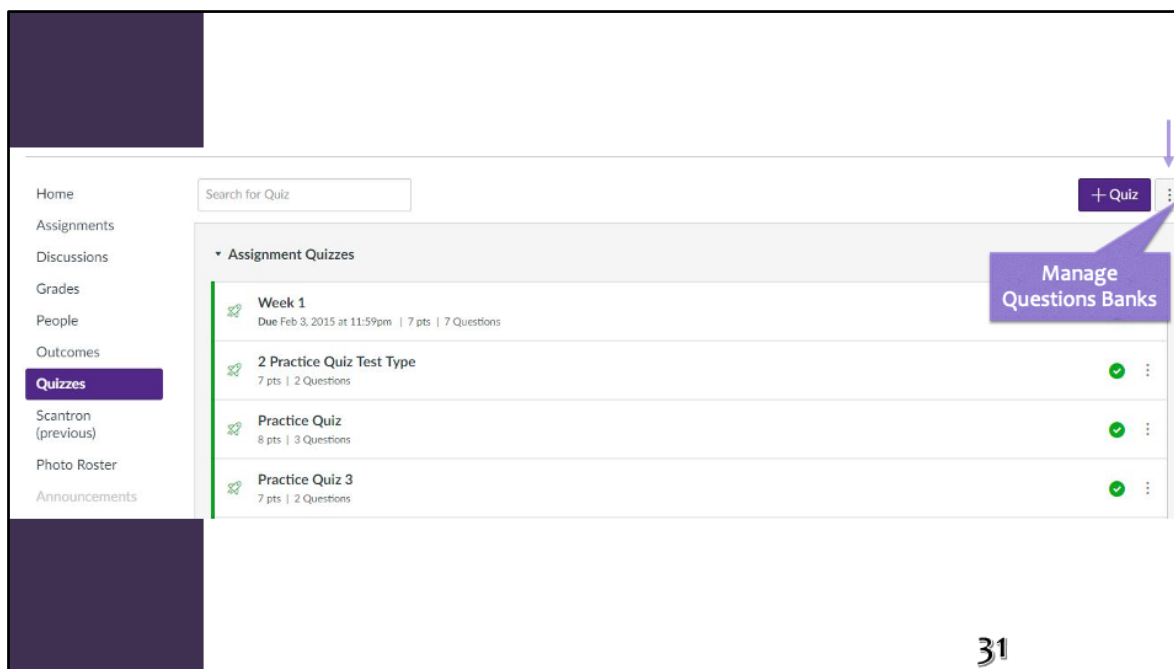
One type of assessment is Selected response type of assessment. Specific questions can be aligned to an outcome from within an exam using
- Questions Banks. This process needs to be taught to faculty as it is not intuitive. We use campus workshops and individual meetings with faculty.

When a quiz, or test is made, all of the questions automatically get filed * in a folder titled Unfiled Questions.

To align questions to an outcome, * a Question Bank will have to be created for each outcome assessed.

- For example, Critical thinking. Once folders are created for each outcome, * the Unfiled Questions folder will be opened.
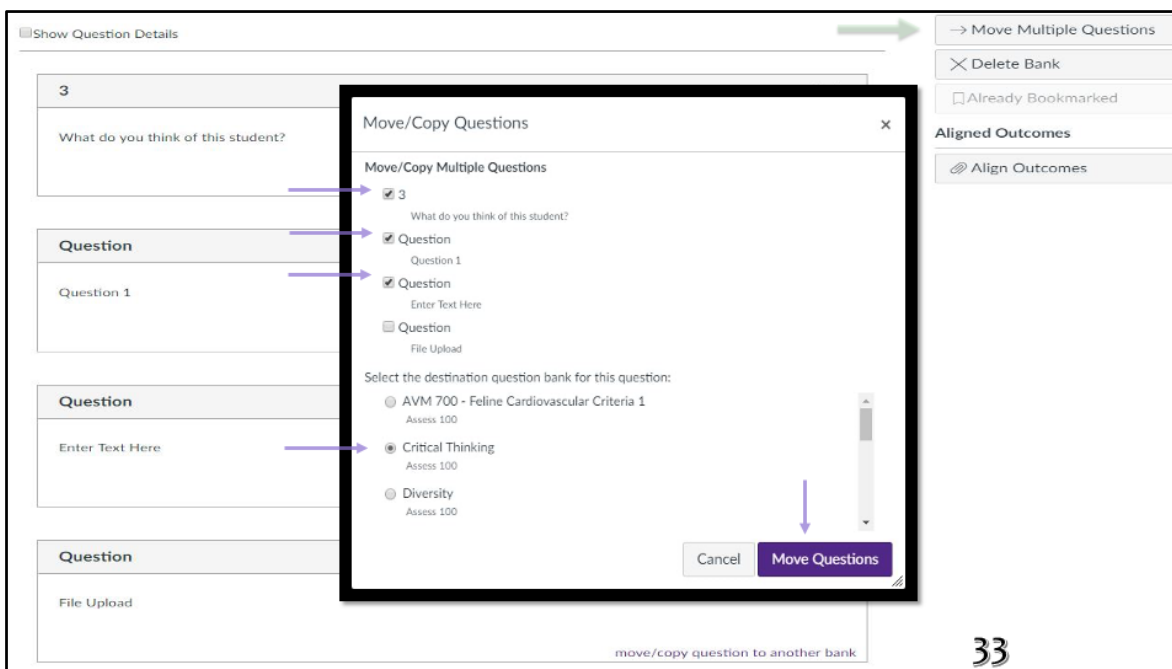
In the unfiled questions folder are all of the questions created on an exam. From this folder of questions, individual questions are aligned with outcomes. To do this you
- select 'move multiple questions'. This brings up a window that shows all of the questions and all of the available question banks. The questions that are to be aligned to an outcomes are selected.
- Then the outcome folder needs to be selected to which the selected questions needs to be aligned.
- Then select Move Questions. By doing this, the question are not moved out of the exam but aligned to an outcome group. I always have to communicate to the faculty that this move does not take the questions out of their test but aligns the specific questions with an outcome.
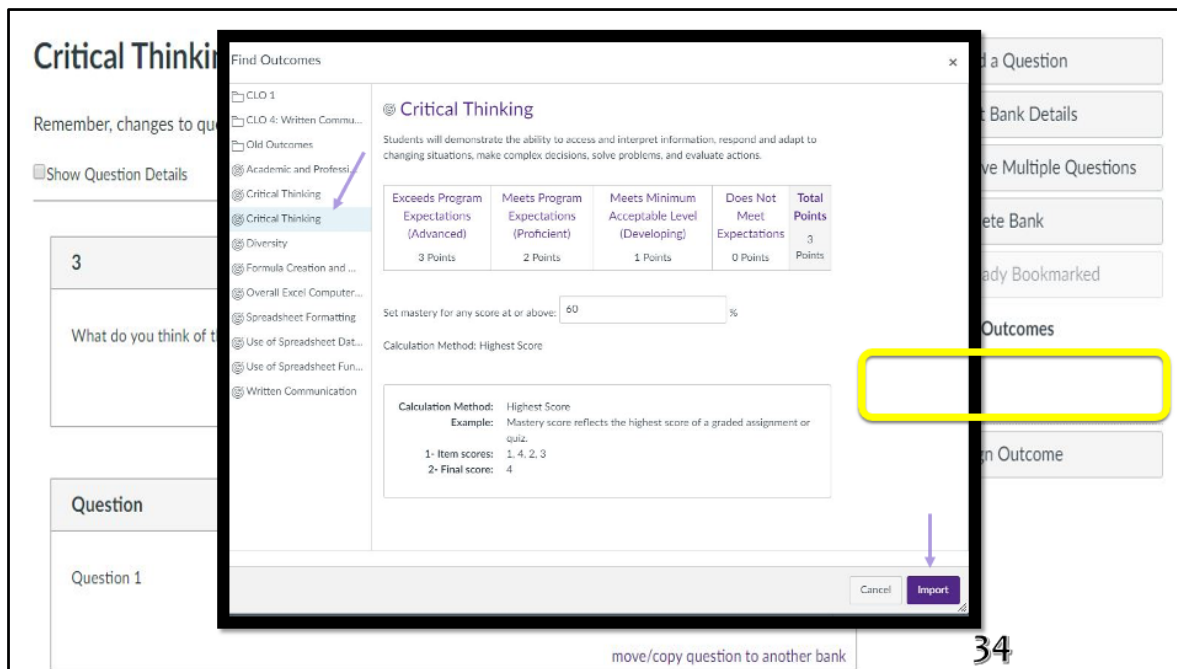
Once they are in the Outcome Folder
- You select Align outcome,
- In the window that appears in which you select the outcome for which the entire folder of questions are to be aligned, then select import.
- Now whenever any questions in this folder are answered, the scores will go to the program.

When aligned, the answered response of each question in an aligned bank will be recorded at the appropriate program/college/institution level. The meta-data collected will enable sorting of the student identifier, date recorded, applied semester, and all necessary data for each time the question was answered. There are many online tutorials for creating selected response assessments, sorting questions into questions banks, and aligning question banks to outcomes. The analysis of the data will occur outside of CANVAS, which will be described later in this article.

Before I show how to align outcomes in a rubric, are there questions about the selected choice alignment for outcomes?

If an Outcome (assessable criterion) is to be scored within a rubric, there are many
choices to make because the assessment technology is very flexibility:
- It all begins by selecting "Add Rubric"
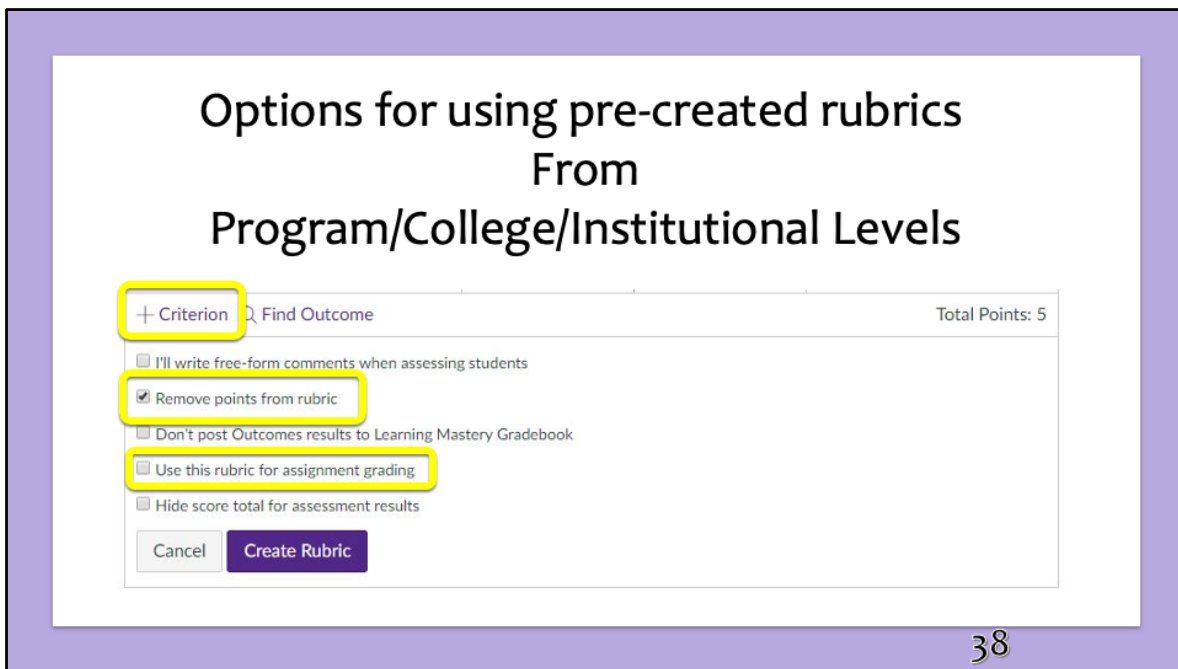
If the program/college/institution has a pre-created rubric that is intended to be used across multiple assignments,
- the button 'Find a Rubric' will open a window to find the appropriate rubric and import it to the assignment.

When the rubric is imported:
- in the edit mode:
- Individual criteria lines (Outcomes) could be deleted if they are not relevant to the particular assignment.

Additional criteria lines can be added to be used for assignment scoring, but scores
from added criterion on the course level will only go to the assignment grade and not
the program/college/institution level.
- Choose to use the rubric for assignment grading or not.
- Removing points from the rubric enabling the instructor to assign their own points
  for grading while the level will still be scored for the program/college/institution.

When the Rubric Creator comes up
- Title the rubric
- Below this is where the faculty member would create any part of the scoring
  device that is not specifically assessing the outcome.
- To add an outcome scoring line, the faculty member would click Find Outcome.
- The list of outcomes brought into the course will come up, so select the outcome
  desired. Once imported it become a part of the rubric.
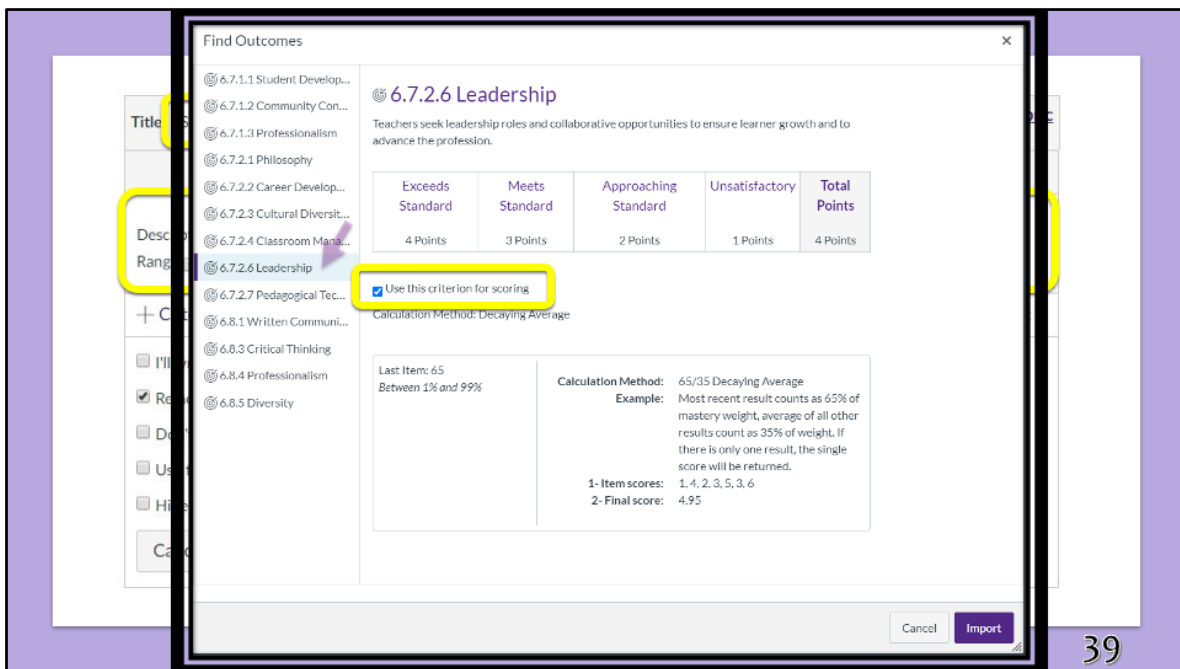
Another option is to create an assignment specific rubric and include scoring lines from outcomes as part of the overall assignment scoring. When the Rubric Creator comes up

- The rubric must be titled
- Below this is where any part of the scoring device that is not specifically assessing the outcome is created.
- To add an outcome scoring line from one of the outcomes imported into the course, click Find Outcome.
- The list of outcomes that had been brought into the course will come up.
- Select the outcome desired and import it into the rubric.
- It is important to note that before the outcome is imported to select or unselect 'Use this criterion for scoring'. The faculty has the option to use the outcome scoring line as part of the assignment score or not use it for the assignment score and simply score it for the program use only.

The criterial lines that are Outcomes will be designated with a target icon in the top left corner meaning that when it is scored, the assessment for that outcome will be collected at the level in which the outcome was created.

The most valuable aspect of using Outcomes in CANVAS is that the faculty do not have to duplicate their efforts in scoring of students for a grade and then later in a report for the unit. The scores that are collected simultaneous with the assignment scoring. The other advantage is that the score is authentic to the student demonstration of achievement that occurs within coursework. Of course tests of validity and reliability on the assessment task and instrument should be confirmed over time. This is important no matter how the assessment scoring is collected.

This is a good time to stop for a few questions.

We consider CANVAS as a data-collection technology. The analysis of data occurs outside of CANVAS. Assessment data can be downloaded in multiple ways. CANVAS has cloud access to data for an extra fee, but for our institution as well as many others this may not be financially feasible.

- Data from the program/college/institution levels is retrieved on the administrative level in the settings.
- By opening 'Reports', which is in the top ribbon of links, you will get to a page with many different options.

In this page, the areas that provide the data needed are the Outcome Export and
Outcome Results.
- the hierarchy of Groups and Outcomes are downloaded by selecting 'Outcome
  Export'. This .csv file includes all learning outcomes that exist within this account
  and will show the details of all associated attributes with each outcome.
- The achievement data collected from the outcomes are downloaded when
  selecting 'Outcome Results'. The technology provides the entire dataset of scores
  or you have the option of selecting individual semesters.

Extracting Data from CANVAS

student name	student id	student sis id	assessment title	assessment id	assessment type	submission date	submission score	learning outcome name	learning outcome id	attempt	outcome score	assessment question	assessment question id	course name	course id	course sis id	section name	section id	section sis id	assignment url	learning outcome friendly name	learning outcome points possible	learning outcome mastery score	learning outcome m...
Huey	6469	####	Final	####	assign	2020-	29	2.1.1	9710	1	4			Music	####	####	MUSI	####	22021	https:	Score	4	3	1 Excee
Huey	6469	####	Final	####	assign	2020-	29	2.2.1	9711	1	4			Music	####	####	MUSI	####	22021	https:	Melo	4	3	1 Excee
Huey	6469	####	Final	####	assign	2020-	29	2.3.1	9712	1	4			Music	####	####	MUSI	####	22021	https:	Chord	4	3	1 Excee
Huey	6469	####	Final	####	assign	2020-	29	2.4.1	9713	1	4			Music	####	####	MUSI	####	22021	https:	Rhyth	4	3	1 Excee
Huey	6469	####	Final	####	assign	2020-	29	2.5.2	9714	1	4			Music	####	####	MUSI	####	22021	https:	Score	4	3	1 Excee
Bou	7416	####	Oral E	####	assignment			S.2.a.	####	1	0			Mast	####	####	THTR	####	22021	https://k-st		4	3	0
Bou	7416	####	Oral E	####	assignment			S.2.b.	####	1	0			Mast	####	####	THTR	####	22021	https://k-st		4	3	0
Bo	7416	####	Oral E	####	assignment			S.2.c.	####	1	0			Mast	####	####	THTR	####	22021	https://k-st		4	3	0
Bo	7416	####	Oral E	####	assignment			S.2.d.	####	1	0			Mast	####	####	THTR	####	22021	https://k-st		4	3	0
Bo	7416	####	Oral E	####	assignment			S.2.e.	####	1	0			Mast	####	####	THTR	####	22021	https://k-st		4	3	0
	7416	####	Mast	####	assignment			S.3.a.	####	1	4			Mast	####	####	THTR	####	22021	https://k-st		4	3	1 Uses
	7416	####	Mast	####	assignment			S.3.b.	####	1	3			Mast	####	####	THTR	####	22021	https://k-st		4	3	1 Writi
####	####	Dr. D	####	assign	2020-	28	1.1 Tc	9162	1	7			Sprin	####		Sprin	####		https://k-st	10	8	0 Adva		

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This .csv report shows the learning outcome results of all outcomes for all students. It includes all of the scoring data and meta-data associated with the course, assignment, outcome, and time-stamps needed for many types of analysis.
From these .csv files, data can be organized in many ways to make the data useful.

We are going to take a short break and then finish the last segment with ideas for visualization. Don't forget to add your question in the chat.

after the 5 – minute break, the last segment will cover
- What to do with the data.
- Ideas for visualization.
- Further discussion and additional questions.
- Examples inside of CANVAS if you would like.

Whether visualizations include tables or graphs, it is essential that the data is presented so the stakeholders (usually the program/unit and its faculty/staff) can assess the meaning and implications for student learning.

- The most important reason for collecting student achievement data by outcome categories and the assessable criteria is to identify successful learning as well as areas in which learning could be improved. There are multiple ways to visualize assessment data. Depending upon technology skills, the .csv files can create visualizations in the form of tables and charts using Excel, RStudio, PowerBI, Tableau, Python, or other visualization products.

Please ask questions anytime that they appear to you.
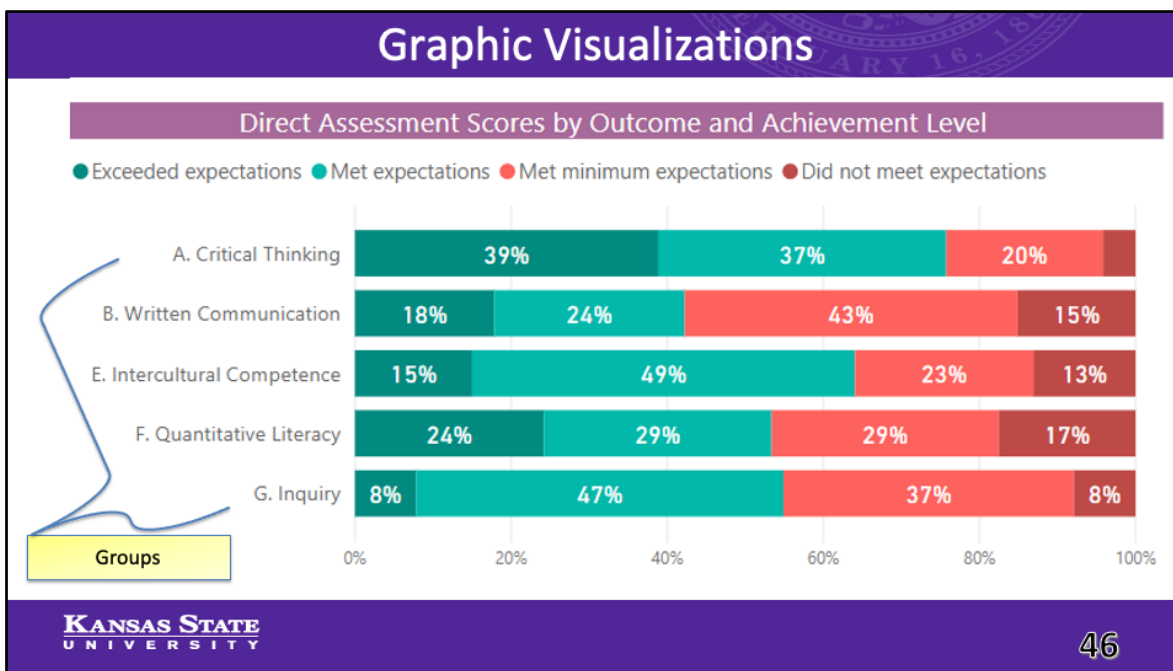
Earlier we talked about the Groups and Outcomes in the administrative levels.
- The usefulness of creating outcome categories (Groups in CANVAS) and the component criteria (Outcomes in CANVAS) comes in the producing visualizations to be used in analyzing the data to better understand learning. When combining achievement scores over time and across assignments, student achievement can be easily understood through a chart.
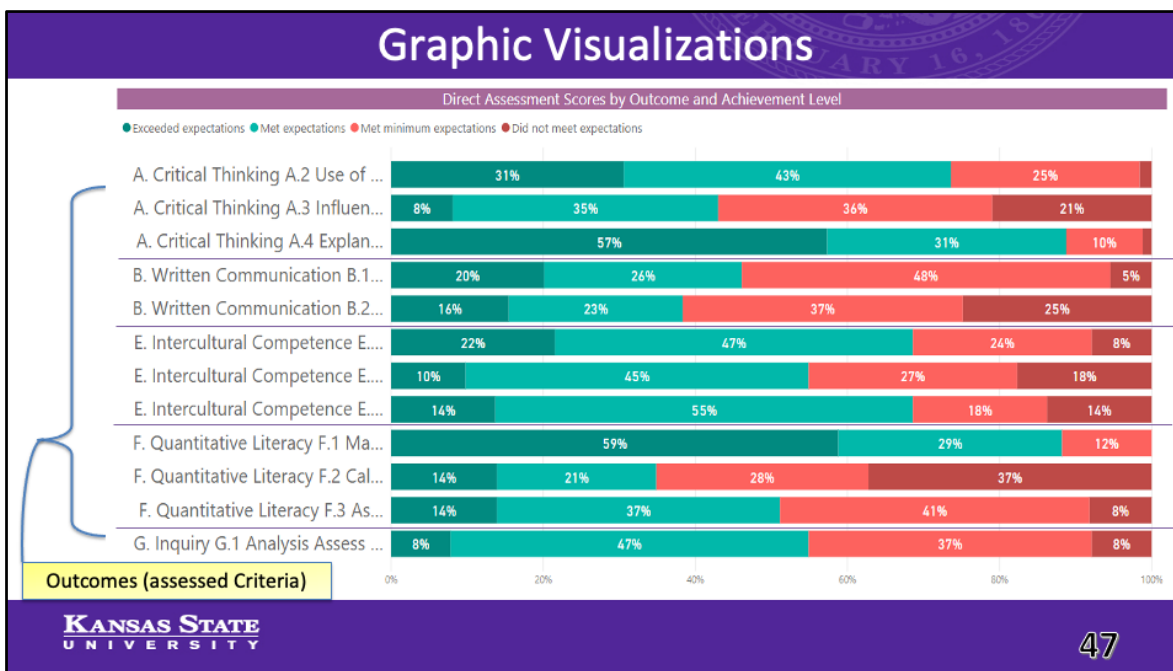
The same data can be expanded to see achievement in each criteria. Because all scores were collected as Outcomes (assessed criteria), achievement can be disaggregated to better understand successful demonstration and challenges the qualities of learning the make up each outcome category group. As you see in each grouping, there is one criterion with which students experienced greater challenges. Without disaggregation into component criteria, this would have remained hidden in the data.
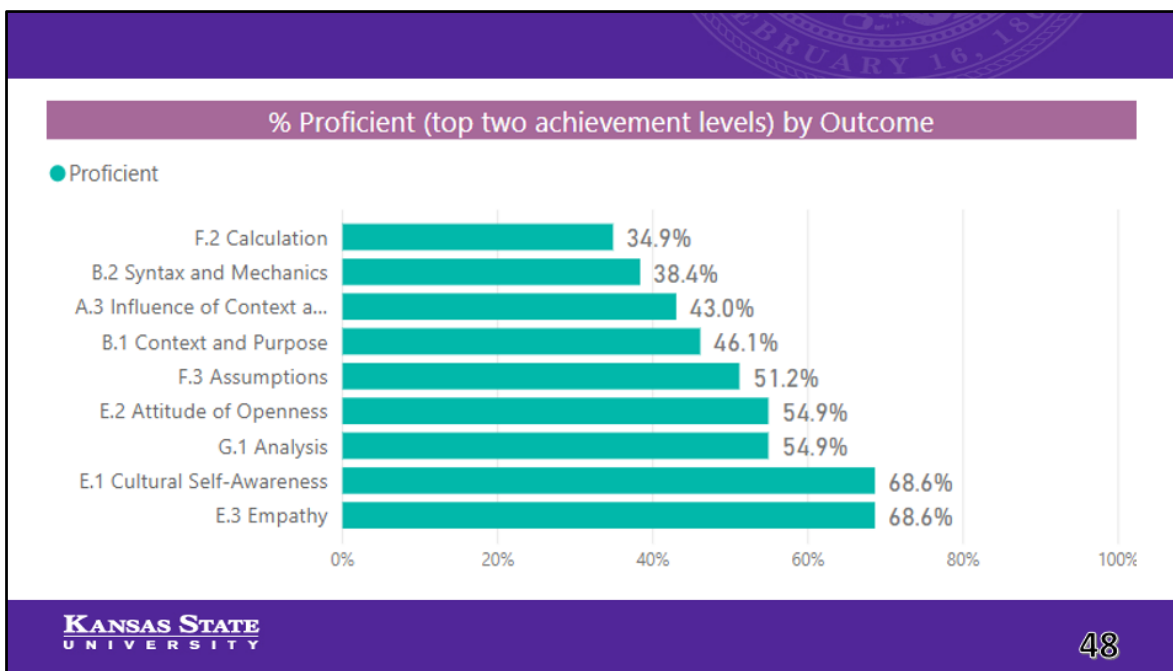
Visualized another way, by sorting from lowest to highest levels of achievement, a visualization like this can expose the most challenging criteria for students to demonstrate in the selected assessments. This has been useful to many programs to guide curricular discussion.

| Direct Assessment Scores by Outcome and Achievement Level										
-	Exceeded expectations		Met expectations		Met minimum expectations		Did not meet expectations		Total	
Outcome	Count	%	Count	%	Count	%	Count	%	Count	%
A. Critical Thinking	**234**	**38.9%**	**222**	**36.9%**	**121**	**20.1%**	**25**	**4.2%**	**602**	**100.0%**
A.2 Use of Evidence	79	30.6%	111	43.0%	64	24.8%	4	1.6%	258	100.0%
A.3 Influence of Context and Assu...	7	8.1%	30	34.9%	31	36.0%	18	20.9%	86	100.0%
A.4 Explanation of Issues	148	57.4%	81	31.4%	26	10.1%	3	1.2%	258	100.0%
B. Written Communication	**92**	**17.8%**	**126**	**24.4%**	**220**	**42.6%**	**78**	**15.1%**	**516**	**100.0%**
B.1 Context and Purpose	52	20.2%	67	26.0%	125	48.4%	14	5.4%	258	100.0%
B.2 Syntax and Mechanics	40	15.5%	59	22.9%	95	36.8%	64	24.8%	258	100.0%
E. Intercultural Competence	**23**	**15.0%**	**75**	**49.0%**	**35**	**22.9%**	**20**	**13.1%**	**153**	**100.0%**
E.1 Cultural Self-Awareness	11	21.6%	24	47.1%	12	23.5%	4	7.8%	51	100.0%
E.2 Attitude of Openness	5	9.8%	23	45.1%	14	27.5%	9	17.6%	51	100.0%
E.3 Empathy	7	13.7%	28	54.9%	9	17.6%	7	13.7%	51	100.0%
F. Quantitative Literacy	**54**	**24.2%**	**65**	**29.1%**	**65**	**29.1%**	**39**	**17.5%**	**223**	**100.0%**
F.1 Mathematical Interpretation	30	58.8%	15	29.4%	6	11.8%			51	100.0%
F.2 Calculation	12	14.0%	18	20.9%	24	27.9%	32	37.2%	86	100.0%
F.3 Assumptions	12	14.0%	32	37.2%	35	40.7%	7	8.1%	86	100.0%
G. Inquiry	**4**	**7.8%**	**24**	**47.1%**	**19**	**37.3%**	**4**	**7.8%**	**51**	**100.0%**
G.1 Analysis	4	7.8%	24	47.1%	19	37.3%	4	7.8%	51	100.0%

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U N I V E R S I T Y

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Sometimes a table is a preferable way for some to view achievement data. The most important factor in visualization is presenting student learning data from CANVAS in the way it is most useful for understanding by the stakeholders, as well as to expose what is not visible in the typical grading scheme. Course grades and GPA presents averages of multiple learning outcomes. Courses or assignments seldom teach only one learning outcome. Grades are aggregations of multiple criteria from multiple outcome groups. To fully understanding what students are learning, and more importantly what challenges their learning achievement, disaggregating scores by criteria is essential. The advantage of collecting these scores using CANVAS assessment technology is in its automation. Faculty score student demonstration of learning though assessment tasks embedded in the learning process while simultaneously automating the collection of assessable criteria scores across multiple assignments and courses.
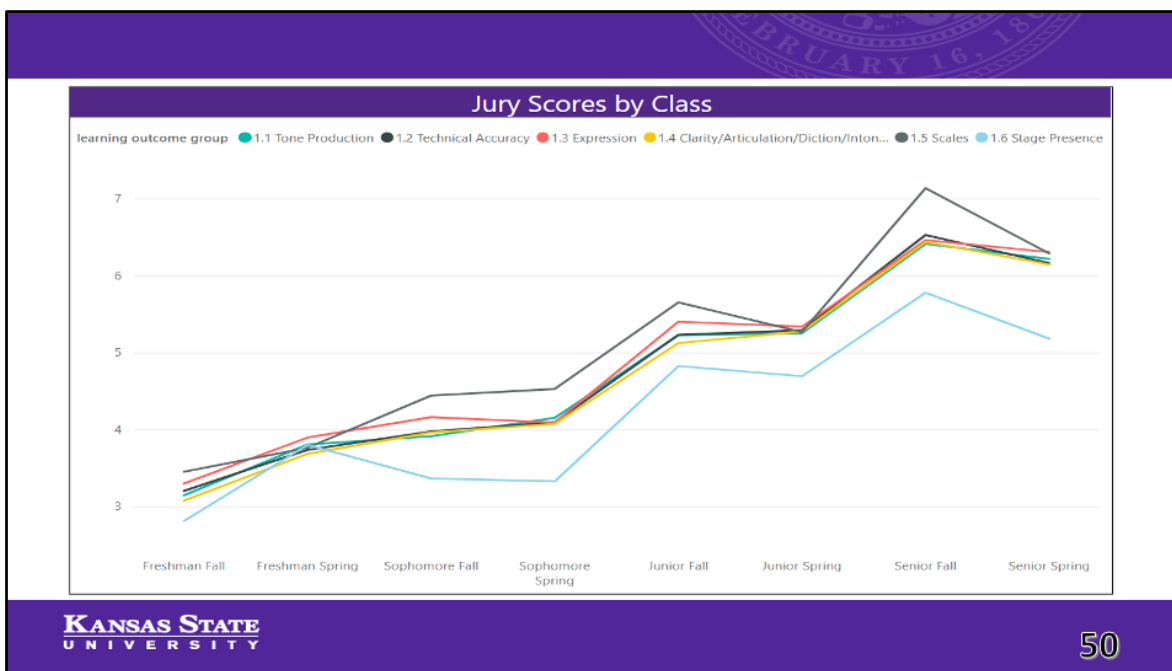
The CANVAS assessment technology can be administered with flexibility to provide data in ways that programs find valuable. When skills are developed and assessed over time, visualizations can differentiate gradual progress toward the outcome development. This is implemented in programs like the visual and performing arts, teacher training, public speaking, and other developmental skill areas. Developmental tendencies can be visualized over students' educational experience to provide evidence when the greatest development occurs or when learning plateaus.
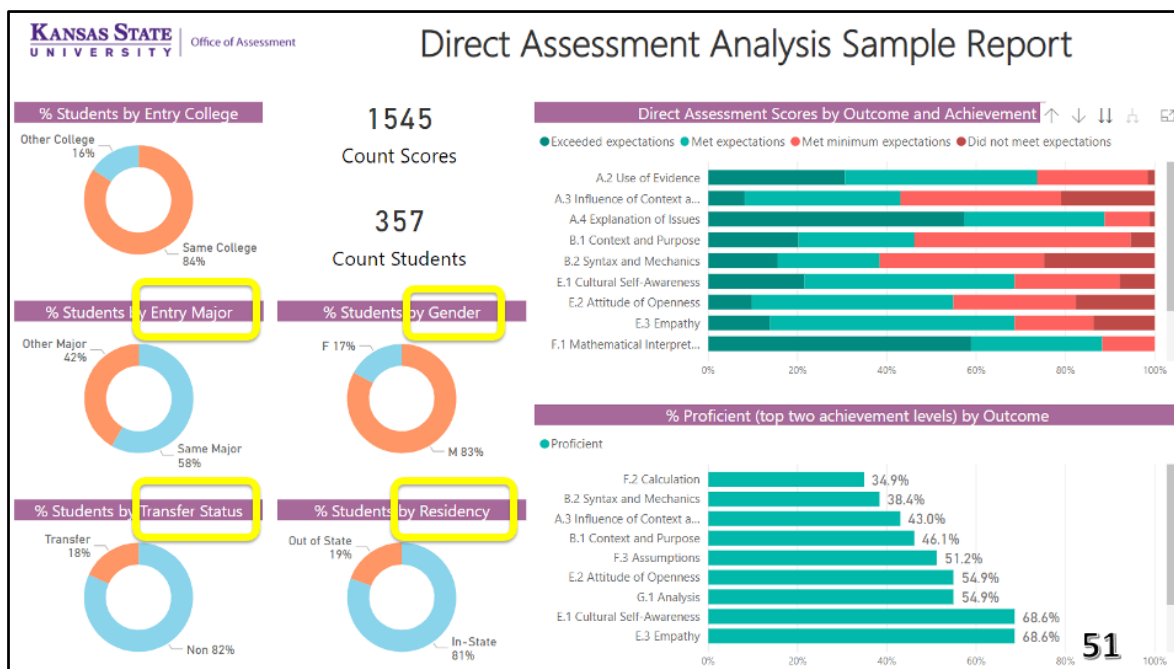
One important advantage to collecting student achievement data through CANVAS outcomes technology is its connection to the student identifier. With student identifier column in the csv file, student achievement data collected can be aligned with the Student Information System enabling filtering by demographic identifiers
- such as gender,
- Transfer status,
- Residency status
- registered major,
- First-generation applicants, GPA, And other such as ethnicity, academic status, and any other identifier that could differentiate learning needs.

In this example, the identifiers serve two purposes: (1) visualizing the calculations of what percentage make up the demographic category and (2) as a filter to selected to change the adjoining tables showing the results from the selected cohort. For example, when I select non-transfer
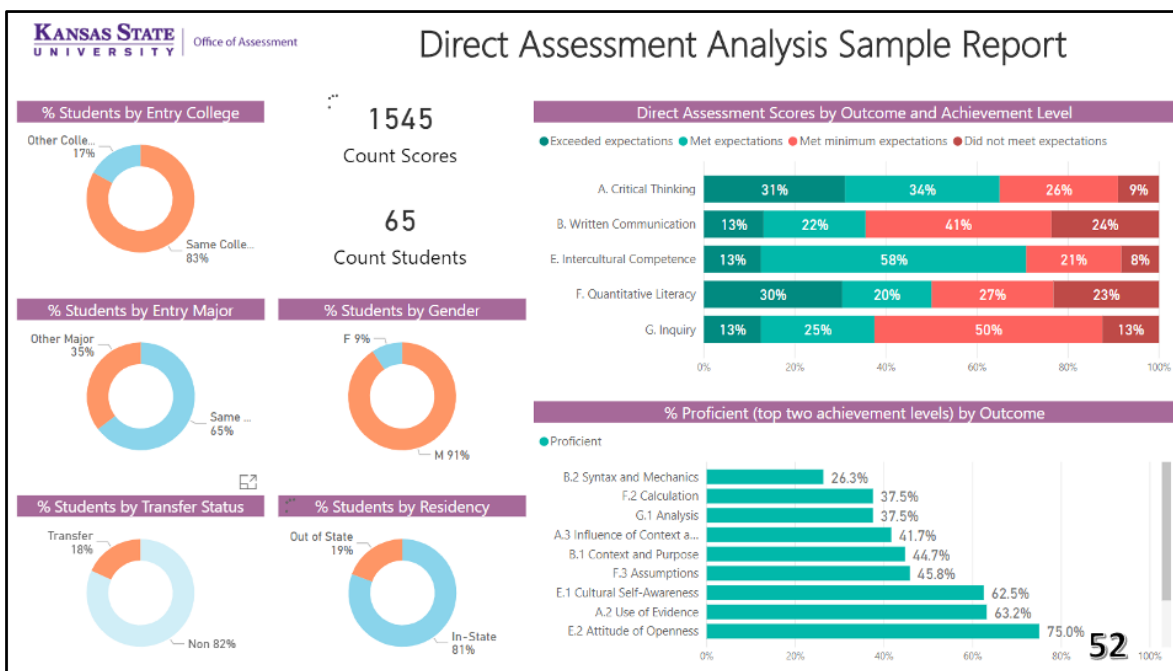
I now see the scores of those that started on our campus

Direct Assessment Analysis Sample Report
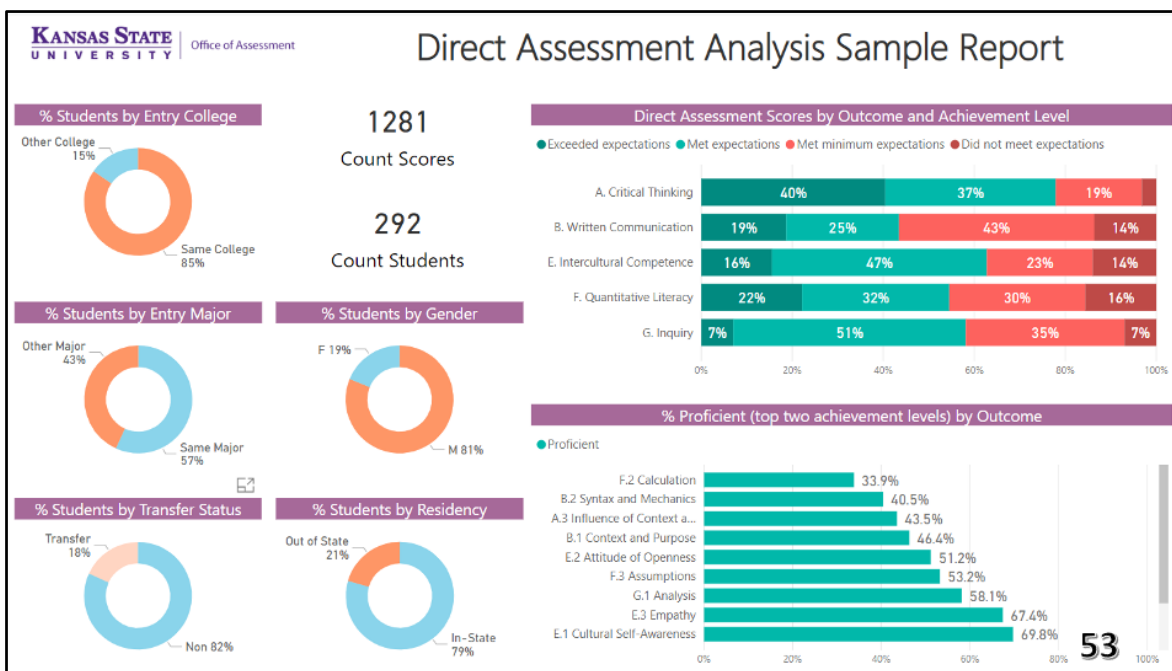
As compared to the scores of those that transferred into the program. The connection to student information enables the ability to disaggregate data by any cohort category for which the institution has access.

Comparing Direct to Indirect Assessment Scores

Outcome

☑ Select all
☑ 01.a* Communicate Effectively by Creating appropriate oral presentations.
☑ 01.b* Communicate effectively by Creating appropriate written documents
☑ 01.c Communicate effectively by Applying appropriate graphic depictions.

Outcome#	# of Scores	% Exceeds Expectations	% Meets Expectations	% Does Not Meet Expectations	Program Score
01.a*					
CNS 660 B	37	51%	49%		5
01.b*					
CNS 660 B	37	62%	30%	8%	5
01.c					
ARE 310 A	11	73%	18%	9%	5
CNS 321 01L	63	48%	33%	19%	4
CNS 321 D	1	100%			5

The Outcome Score is the average of direct and indirect assessments on shown on this page	Outcome Score 4.45

Senior Survey Response

How well is CNSM fulfilling the goal of preparing you to:	Average
01.c Communicate effectively by Applying appropriate graphic depictions.	4.19
01.b* Communicate effectively by Creating appropriate written documents	4.22

Alumni 2-year Survey Response

How well has CNSM fulfilled the goal of preparing you to:	Average
01.a* Communicate Effectively by Creating appropriate oral presentations.	3.73
01.b* Communicate effectively by Creating appropriate written documents	4.09
01.c Communicate effectively by Applying appropriate graphic depictions.	4.73

Alumni 5-year Survey Response

| How well has CNSM fulfilled the goal of preparing you to:	Average
01.a* Communicate Effectively by Creating appropriate oral presentations.	4.00
01.b* Communicate effectively by Creating appropriate written documents	4.14
01.c Communicate effectively by Applying appropriate graphic depictions.	4.23

Employer Survey Response

| How well has CNSM fulfilled the goal of preparing students to:	Average
01.c Communicate effectively by Applying appropriate graphic depictions.	3.96
01.b* Communicate effectively by Creating appropriate written documents	3.86
01.a* Communicate Effectively by Creating appropriate oral presentations.	3.77

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Another use of the student identifies is alignment with other data sources such as surveys and tools that exists outside of CANVAS. Programs/units have aligned outcomes used in CANVAS to questions surveyed to students, alumni, internship directors, or other data sources that can provide alternative scoring of the outcomes and assessable criteria.
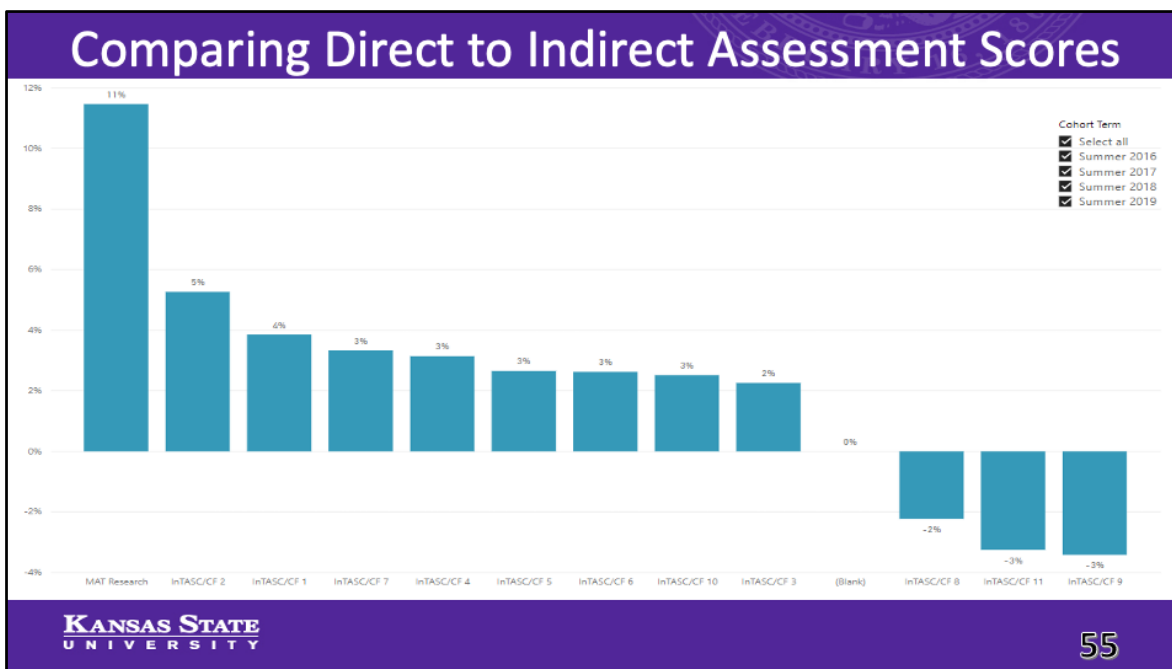
One example that some programs have found useful is to compare the score of
students' perceived level of achievement to the faculty score using the same scale.
When student self-assessed scores (which are indirect assessments) are compared
against the faculty's direct assessment scores, what can be exposed are students'
inflated concept of their learning or lack of conception of proficiencies. In this
example, the bars that go up show the percentage students over-inflate the
capabilities on certain criteria as compared to the instructor scores. Bars the go down
demonstrate the percentage that student do not recognize the level of achievement
as scores by the instructor.
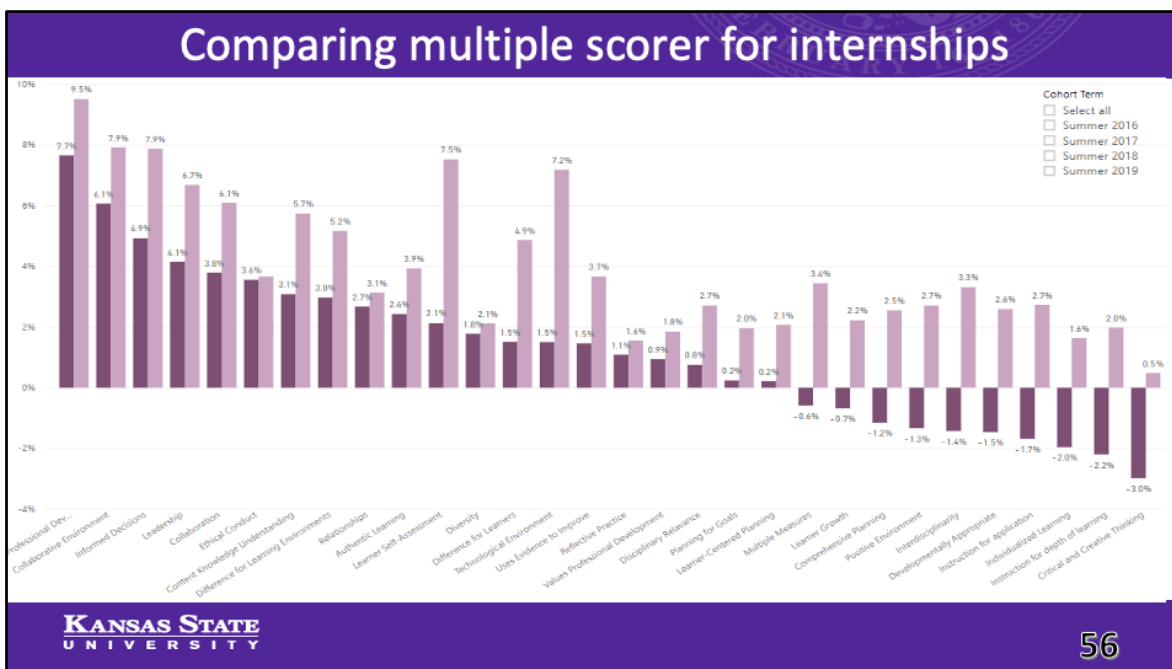
Other ways that have been useful is comparing faculty scores of achievement in coursework as compared to internship scores for fieldwork. When validity of the measure and reliability of scoring is confirmed, these comparisons could expose the level of scoring rigor in coursework as compared to applied expectations beyond the institution.
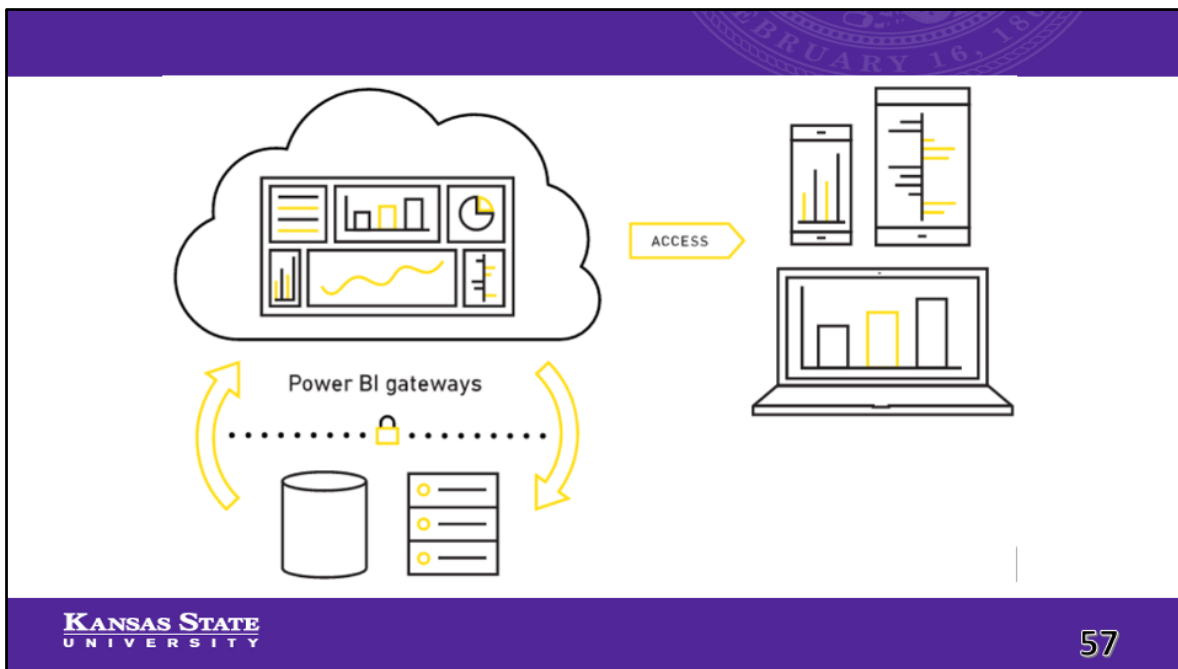
It is possible to purchase or to build automated connections to the CANVAS data that would eliminate the step of downloading data to align into the visualizations. Our university has created an automated download of all CANVAS data into a data-warehouse. With an automated connection, data flows directly to the visualization so unit faculty can efficiently analyze and assess the meaning to support instructional and curricular decisions. Our data flow will refresh 4-times daily.

There are many other ways that CANVAS outcomes can be useful to guide instructional and program improvements. Using the automation of data collection and the organizational structure through CANVAS is the foundation necessary for effective and efficient integration.