INSTITUTIONAL EFFECTIVENESS: STUDENT LEARNING OUTCOMES (SLOs) ASSESSMENT

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EXPECTED OUTCOMES OF PRESENTATION

Overall Goal: Provide information regarding best practices regarding assessment of student learning outcomes (SLOs) and ***using the results of assessment for improvement*****

- Objectives: Participants should understand:
  - How to choose a useful SLO that contributes to the ability to use results of assessment for improvement
  - How to ensure that the type of assessment method contributes to the ability to use results of assessment for improvement
  - How to ensure that the way you analyze and present results contributes to the ability to use results of assessment for improvement
  - How misconceptions of the assessment process contribute to the inability to use results of assessment for improvement
  - How to ensure that there are clear, direct relationships among SLOs, assessment methods, analysis and presentation of results, and use of results for improvement

WHY THESE OBJECTIVES FOR THE PRESENTATION

- First, they address the essential elements of the process

- Second, an examination of recent reports from instructional programs revealed that *all* of these elements were contributing to a lack of ability to use results of the process for improvement

  - Your HLC review committee identified the need to demonstrate the use of results for improvement

  - However, they did **no**t indicate *how* to improve your work so that improvements to SLOs could be more widespread within and across programs.

DEPARTMENT AND PROGRAM OUTCOMES

- These are the things that are the RESULT of something that is done in a program or department

- Two basic types of outcomes that you are responsible for:
    - Student Learning Outcomes (SLOs)
        - Relevant for **all educational programs**, majors, etc.
    - Business Outcomes
        - Relevant at the DEPARTMENT LEVEL; these are things such as processing of work, dealing with student business (advising, complaints, etc.)

- This presentation will focus only on SLO assessment and improvement

STUDENT LEARNING OUTCOMES THAT CAN BE USED FOR IMPROVEMENT: WHAT . . .

- **Students should know** – essential knowledge: theories, facts, history, etc.

- **Students should be able to do:**
  - **Cognitive Abilities/Skills** – such as critical thinking, problem solving, communication, etc.
  - **Discipline-Specific Skills** – essential skills/behaviors (e.g., use appropriate research methods to address scholarly research questions; perform a clinical evaluation of a client; evaluate potential security threats to a website, etc.)

- **Values/attitudes should be developed** as they apply to a field of study (e.g., professional/disciplinary ethics)

TYPES OF ASSESSMENT/EVALUATION

- Summative Assessment/Evaluation

  - Purpose is to come to some final decision regarding accomplishment, adequacy, competency, final grade, etc.

- Formative Assessment/Evaluation

  - Purpose is to provide information about current state of accomplishment, competency, progress so that information can be used for improvement

  - This process is cyclical

ASSESSMENT OF SLOs FOR INSTRUCTIONAL PROGRAM EVALUATION IS FORMATIVE

- Everything should be done so as to provide information that can be used to improve student learning

- Thus, we should not say that "no improvements are needed at this time"

- Improvements are always needed, and possible, if our purpose is formative.

GUIDING "RULE" FOR ASSESSMENT OF STUDENT LEARNING OUTCOMES ASSESSMENT

EVERYTHING YOU DO SHOULD BE DESIGNED TO ALLOW YOU TO ULTIMATELY IMPROVE YOUR PROGRAM

- Outcomes: These need to be expectations of student learning that NEED to be improved

- Assessment Methods and Design: Need to provide data/information that can be used to help make decisions about how you will improve student learning

- Analysis and Reporting of Results: should provide information that can be used to make improvements

INSTITUTIONAL EFFECTIVENESS REGARDING STUDENT LEARNING OUTCOMES (SLOs)

Institutional Effectiveness process requires that we:

1. Identify expected student learning outcomes

2. Assess the extent to which outcomes are achieved (may involve a "sub-step" regarding setting expected achievement levels)

3. Analyze the results of assessment

4. **Use results to seek improvement** in student learning outcomes

CSU PUEBLO ACADEMIC PROGRAM ASSESSMENT REPORTS INCLUDE THESE STEPS

Outcome Assessed	Date of Last Assessment	Assessment Method	Who was assessed?	Expected achievement level	Results of Assessment	Department Conclusions	Improvements planned
Outcome 1							
Outcome 2							
Outcome 3							
Outcome 4							
Outcome 5							

PICKING THE RIGHT SLOs

- Pick a manageable number of *essential* SLOs

- Pick SLOs that can be assessed given the expertise and time of faculty

  - More on this as we talk about assessment methods

PICKING A *MANAGEABLE NUMBER* OF *ESSENTIAL* SLOs

- What is a manageable number of SLOs?
  - Ultimately up to faculty, but I generally suggest focusing on 3 – 5 (certainly not fewer than 3)
  - As we will see, though, each SLO should be assessed with two or more methods as a "best practice"

- What is essential?
  - Things students should know, be able to do, or have attitudes and/or values that simply MUST be accomplished prior to graduation
  - Essential SLOs are things that you already know (or suspect) need improvement

PROBLEMS SEEN WITH SLOs

1. Using a student success outcome instead of an SLO

2. Confusing what we *do* with what we expect students to achieve (SLOs)

3. Outcomes that are too complex or unclear

4. Not focusing on a manageable number of "essential" outcomes

5. Outcomes that are not clearly related to the assessment methods designed to evaluate them

SLO PROBLEM 1: USING A STUDENT SUCCESS OUTCOME INSTEAD OF AN SLO

- Student Success Outcomes; examples:
  - Graduation rates
  - Retention rates
  - Licensure exam pass rates
  - Grade distributions or DFW rates
  - Course completion rates; especially in "gateway courses"
- None of these can provide information about student learning that can be used by faculty for improvement of student learning

SLO PROBLEM 2:
CONFUSING WHAT WE *DO* WITH WHAT WE EXPECT STUDENTS TO ACHIEVE (SLOS)

- The following are NOT outcomes, they are things we do to achieve SLOs:
  - Provide excellent instruction/teaching
  - Use advanced educational technology
  - Provide appropriate curricular design and innovation
  - Ensure appropriate course content
  - Provide qualified faculty and instructional support staff

- BUT, they *are* the things we can focus on in order to improve student learning outcomes

SLO Problem 3:
OUTCOMES THAT ARE TOO COMPLEX OR UNCLEAR

- Focus on Knowledge OR Skills OR Values (don't combine)
  - A poor outcome: "Students should know the history of the ethical standards for _____ and display those characteristics in a clinical setting." This contains both knowledge and skill outcomes; better to write two SLOs if these are essential

- Ensure clarity and conciseness (especially when submitting to internal or external (e.g., HLC or other accrediting bodies) – focus on the audience

SLO PROBLEM 4:
NOT FOCUSING ON "ESSENTIAL" OUTCOMES

- Picking SLOs because of convenience of related assessment methods
  - Some methods (e.g. grades, licensure exams, etc.) are useful for some purposes but NOT useful for institutional effectiveness purposes (they don't provide "diagnostic" results that can be used for improvement

- Being too ambitious in terms of number of SLOs
  - 3-5 is usually manageable

- Not focusing on SLOs that really NEED to be improved
  - Formal Evaluation Projects: first step is a "needs assessment"
  - Evaluation of SLOs: formal needs assessment often not possible/practical; use less formal methods
    - faculty discussions, student input, input from professional organizations or employers, etc.
  - If this isn't done, you often get to a point where you say you don't need to improve anything.

SLO PROBLEM 5: OUTCOMES THAT ARE NOT CLEARLY RELATED TO THE ASSESSMENT METHODS DESIGNED TO EVALUATE THEM

- Sometimes this is a problem because SLO is not written very clearly (Problem 2)

- Assessment method and SLO are clearly unrelated (e.g., SLO is about knowledge while assessment method focuses on a skill)

SOME EXAMPLES OF UNACCEPTABLE SLOS

- Using a *Student Success Outcome* instead of an SLO: "Students should graduate within 4 years of entering the program."

- Using a *course or curricular improvement as an outcome*: "The content of the English Literature course will be modified in order to increase student critical thinking skills."

- Using a *modification of instruction or instructional materials* as an outcome: "The program will acquire new computer-aided instructional programs designed to enhance student learning for biology laboratories."

- Using an SLO that is *too complex/compound*: "Students preparing to be elementary school teachers should know the underlying principles of effective teaching, be able to put those principles into practice, and be able to interpret the results of standardized testing of student knowledge and skills."

SOME EXAMPLES OF GOOD SLOS

- Students should understand the critical theoretical foundations of modern-day Psychology.

- Students should be able to write a professional-level evaluation of the results of the _____ diagnostic test.

- Teacher education students should demonstrate their ability to successfully interact with parents during student-focused consultation.

- Students should be able to engage in critical problem solving.

ASSESSMENT OF OUTCOMES

- You must have at least one assessment method for EVERY outcome, and you should try to have more than one ("triangulation")

- Reviewers will want it to be VERY obvious that the assessment method you use CLEARLY assesses the outcome you intend to assess. Technically, this is called VALIDITY.

BASIC TYPES OF ASSESSMENT METHODS

- Assessment methods can be *quantitative* or *qualitative*
    - Quantitative: surveys, rubrics, tests, graded essays, etc.
    - Qualitative: interviews, focus groups

- Assessment methods can be *direct* or *indirect*
    - Direct: the results of the method provide information about the outcome being assessed; no inferences needed regarding knowledge, skills, values
    - Indirect: assessment provides information that can be used to make inferences about the outcome

ASSESSMENT METHODS

- Direct Methods:
  - Quantitative:
    - Tests: standardized or in-house/classroom tests
    - Projects, other student-produced products **with rubric**
    - Program-embedded assessments **with rubric**
  - Qualitative:
    - Interviews where questions designed to evoke the knowledge or attitudes/values that student should exhibit

- Indirect Methods:
  - Quantitative:
    - Opinion surveys
  - Qualitative
    - Interviews where student feelings, opinions can be expressed
    - Focus Groups where student feelings, opinions can be expressed

EXAMPLES OF TYPES OF ASSESSMENTS

	Quantitative	Qualitative

Direct	• Rubrics used to evaluate course-embedded artifacts of learning
	   • Papers
	   • Projects
	   • Essays
	• Standardized tests/exams (caution)
	• Classroom tests (caution)
		• Interviews focused on student knowledge or skills (interview questions to evaluate knowledge or values/attitudes)

Indirect	• Student opinion questionnaires • Employer opinion questionnaires • Alumni opinion questionnaires	• Interviews regarding opinions • Focus Groups regarding opinions

ASSESSMENT METHODS TO AVOID

- **Grades (course or exams, projects, etc.) and Grade Distributions**
  - **Often very subjective, inconsistent from instructor to instructor**
  - **No diagnostic information**
- **"TOTAL" score from a Rubric!**
  - More later, but simply assigning a final/total score is the same problem as grades
- **Licensure exams, qualifying exams, etc. that provide only a total/final score**

ASSESSMENT METHODS: "COURSE-EMBEDDED" ASSESSMENTS

Definition:

Assessment methods that utilize student work that is part of the work required for a course: exams, projects, papers, etc.

EXAMPLE OF USING COURSE-EMBEDDED ASSESSMENT

- In a course, students take a final comprehensive exam that covers the essential knowledge that is expected of them.

- FIRST: those exams are used by the instructor to give a course grade

- SECOND: those exams are "extracted" (copied and de-identified) and given to additional individuals (usually instructors in the program) with a RUBRIC designed specifically to focus on the SLO(s) being evaluated.

  - The rubrics are evaluated for consistency/reliability and summarized for program review purposes.

  - Once enough "data" on these results is obtained; they are summarized/analyzed, presented to the whole faculty, and used to seek improvement in course(s), instruction, curriculum, etc.

ASSESSMENT METHODS: RUBRICS

- Can be used for evaluation of Projects, Course-Embedded Assessments, Student Writing Samples, etc.

- Rubrics are tools that help us to specify the level of achievement exhibited by the student on the assignments

- They have three components:
  - Rows
  - Columns
  - "Cells" defined by intersection of the rows and columns

RUBRIC DETAILS

- Rows: these represent the specific "dimensions" of the outcome; e.g. in evaluating writing, there would be rows for mechanics, content, organization, style, etc.

- Columns: these represent the levels of achievement, usually identified with a label and number, such as "Excellent: 4; Good: 3; Fair: 2; Unacceptable/Poor: 1)

- Cells: the specific combination of the dimensions and levels of achievement; USUALLY we provide a brief narrative description in the cells to allow raters more explanation of what is meant by that specific combination

USING A RUBRIC TO EVALUATE AN SLO: "STUDENTS SHOULD BE ABLE TO PRODUCE A RESEARCH REPORT"

RUBRIC FORMAT: RESEARCH PAPER

Component	Excellent (5)	Good (4)	Acceptable (3)	Weak (2)	Unacceptable (1)	Score
Literature Review	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	FOCUS OF SLO
Identification of Research Problem	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	FOCUS OF SLO
Research Question(s)	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	FOCUS OF SLO
Specifies Research Methods to test Research Question(s)	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	FOCUS OF SLO
Use of Analytical Methods	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	FOCUS OF SLO
Reporting Results	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	FOCUS OF SLO
Relating Results to Prior Research and Contributions to Field	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	Description of characteristics of work produced at this level	FOCUS OF SLO
						TOTAL SCORE:

USING RUBRICS: BEST PRACTICES

- Use two or more evaluators per student work being evaluated.

  - Disagreements can be resolved statistically (use mean/median) or taking opportunity for consensus building

  - Improves your confidence that the final score assigned actually represents the quality of the student work (i.e., in psychometric terms, "reliability improves validity."

USING RUBRICS: BEST PRACTICES

- Don't focus on the "Total" score – it provides NO diagnostic information

- Analysis: look at the information you assemble across students for EACH component – that is diagnostic information

USING RUBRICS: BEST PRACTICES

- Reporting: focus on which COMPONENTS were strong and which were weak
  - Thus, when you finish analysis you can focus efforts on specific areas that need improvement

USING RUBRICS: BEST PRACTICES

Analysis of Results: <u>Means can be misleading</u>; use frequency or percent distributions! Note: both examples have mean = 3.0

	Excellent (5)	Good (4)	Acceptable (3)	Weak (2)	Unacceptable (1)
Example 1	40%	5%	10%	5%	40%
Example 2	5%	20%	50%	20%	5%

EXAMPLES OF GOOD RUBRICS

- Go to: Association of American Colleges and Universities and see their "VALUE" rubrics (Valid Assessment of Learning in Undergraduate Education) (http://www.aacu.org/value/rubrics/index_p.cfm?CFID=46410703&CFTOKEN=27003994)

- 16 Rubrics; can be downloaded for free if you sign up

- NOTE: your "Colorado Guaranteed Transfer Pathways" plan has implemented some of these for Gen Ed SLO assessment statewide in designated courses

Oral Communication Value Rubric*

Definition: Oral Communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

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	Capstone 4	Milestones 3	2	Benchmark 1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced, but is not explicitly stated in the presentation.

ASSESSMENT TRIANGULATION

- Historically: an ancient (and modern) method (as early as 1st Century) in cartography/geodesy as well as navigation, surveying, etc. to help locate and describe distances, etc. A series of adjacent triangles are created and using trigonometry, distances are calculated.

- In assessment, the term refers to the use of multiple assessment methods of the same expected outcome. While triangulation refers to three of these, in practical terms we hope to have at least two.

- Multiple measures of the same outcome help us to ensure our conclusions are reasonable.

  - Evaluate/assess SLOs using two or more direct methods, one direct and one indirect method, etc. Make final decision based on consensus.

ASSESSMENT METHODS: RELIABILITY AND VALIDITY

- Psychometrically:
    - Reliability = Consistency; Validity = Accuracy
    - With quantitative research, there are statistical and research design methods to maximize both

- For IE/Assessment:
    - If you have the capability to do quantitative evaluations of these, please do so.
    - For many measures, especially qualitative, these psychometric terms are not relevant

- **Bottom Line:**
    - **YOU must be confident that you are "measuring" what you intend to measure, and then**
    - **YOU ultimately need to be able to *convince* an external reviewer that what you are doing is reasonable**

ASSESSMENT "RESEARCH DESIGN" – SOME CAUTIONS ABOUT USING RESULTS

- Asking questions (qualitative method), or administering a test, etc. only AFTER a student participates in a program does not tell you much about whether the program had an effect on the student

  - This is called a "post-test only" design in the research literature, and many other factors could be affecting the student's performance at the end of a program (other experiences, etc.)

- Pretest – Posttest allows you to see if any changes have occurred

- BEST: have a "control group" *with* Pretest – Posttest; this is a very powerful design; but often very impractical.

- Research design includes considerations of "sample size." Advice: if you have only a small number of students, evaluate them all; if you have a large program, obtain a sample (often, a sample of classes can be used)

- **Guidance: do the best you can with the resources you have!**

- **THEN: Only use results to seek improvement when you believe you have enough evidence to do so!**

EXAMPLES OF UNACCEPTABLE ASSESSMENT METHODS

- Students should understand the critical theoretical foundations of modern-day Psychology.
  - Assessment: Final exam results (grade 0 – 100). Problem: how does this exam give direct (or even indirect) information regarding the expected outcome?

- Students should be able to write a professional-level evaluation of the results of the _____ diagnostic test.
  - Assessment: students are surveyed and asked if they feel they are prepared to write the evaluation. Problem: this would require a direct assessment of their writing, not an indirect question that is not even focused on the writing.

- Teacher education students should demonstrate their ability to successfully interact with parents during student-focused consultation.
  - Assessment: State licensure exams show a 90% pass rate. Problem: is not clearly related to outcome; exam doesn't address this skill at all.

- Students should be able to engage in critical problem solving.
  - Assessment: Faculty are asked to evaluate the state of critical thinking among students during a faculty meeting? Problem: Validity? Reliability?

A WORD ABOUT ANALYZING AND USING RESULTS

- In much of educational research, we are not able to use experimental, random-assignment designs

- We have to use "quasi-experimental" or usually correlational research to evaluate our work

- They often require very sophisticated statistical modeling to given some indication of possible cause-effect relationships

- BUT, YOU ARE NOT DOING RESEARCH, YOU ARE DOING EVALUATION
  - You need to be aware of the limitations of your "designs" and analysis tools; but, you CAN make some inferences if you are cautious and don't jump to conclusions.

A NOTE ON SEEKING IMPROVEMENT FOLLOWING ANALYSIS

- You need to determine how you WOULD use the results based on different scenarios, BEFORE you analyze results
  - What if results show little effect on outcome(s)?
  - What if results show a very strong effect on outcome(s)?
  - What if results are not interpretable?

- This step may result in your rethinking/redoing what you planned to do

- NOTE: based on your HLC reaffirmation review, avoid using improvements of assessment methods in the "improvement" column of your report; you need to focus on making changes designed to improve student learning.

TYPES OF IMPROVEMENTS

Types of improvements to seek:

- Improvements on how your program is designed (curriculum design)
    - Are participants exposed to all the information they need?
    - Is the information presented in a useful way?
    - Are the individuals involved in the program well-trained and capable?
    - What has been included that is irrelevant?
    - Are courses and any prerequisites arranged appropriately?
    - Etc.
- Changes to how the program is implemented (curriculum implementation)
    - Are we teaching the right things in the right courses in the right order? (Curriculum Matrix)
    - Do we have all the necessary resources?
- Changes to content of course(s)
- Changes of instructors, of instructional materials and resources for instruction

CAUTION: "EXPECTED ACHIEVEMENT LEVELS"

Outcome Assessed	Date of Last Assessment	Assessment Method	Who was assessed?	Expected achievement level	Results of Assessment	Department Conclusions	Improvements planned
Outcome 1							
Outcome 2							
Outcome 3							
Outcome 4							
Outcome 5							

THE POSSIBLE PROBLEM WITH EXPECTED ACHIEVEMENT LEVELS

- Why is it done?
  - To set expectations for acceptable student performance levels for each outcome

- Why Not?
  - If expectations are not set in a very systematic and realistic way (i.e., both high enough and not too high), then programs can be misled regarding their students performance.
  - Setting criteria too low gives false impression that all is well; setting criteria too high gives false impression that there is serious trouble.
  - *Even if* criteria are set in a systematic and realistic way, the very idea of "criteria" works against the underlying purpose of formative assessment: to continuously improve the program's SLO performance.
    - If criterion reached, faculty/administrators no longer try to improve SLO
    - Even if 100% achievement, then you should think about setting higher expectations.
    - Suggestion: have an expected achievement level of: "Student performance will improve compared to the prior year."

What should CSU Pueblo do regarding setting criteria?

- Realize that in a practical sense many/most reviewers will expect to see these criteria, SO

- At least make sure that you are engaging faculty in a systematic and realistic way to set them, AND

- Revisit these criteria on a regular basis.

- *At all costs, avoid saying "no improvement(s) necessary" unless ALL your students are performing at the highest possible level! At that point, move on to a new SLO!*

THANK YOU! AND, ANY ADDITIONAL QUESTIONS?

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