



THE ASSOCIATION OF EDUCATIONAL RESEARCHERS OF ONTARIO



L'ASSOCIATION ONTARIENNE DES CHERCHEURS ET CHERCHEUSES EN ÉDUCATION

Measuring and Assessing 21st Century Learning Interventions

Adobe Connect Session
October 20, 2016
12:00 – 2:00

Session Overview

- ▶ Semi Formal Presentation style with opportunities to ask questions / have discussion throughout the session
- ▶ Review of Competencies
- ▶ Role of Researchers in Measurement and Assessment
- ▶ Current State of Assessment
- ▶ Deconstructing Formative Assessment and the Use of Rubrics
- ▶ Approaches to Developing Measures
- ▶ Use of Technology
- ▶ CODE Project at TVDSB – The Library Learning Commons



Current 21st Competencies

- ▶ As Identified by Ministry of Education: 21st Century Competencies: Foundation Document for Discussion, December 2015
 - Critical Thinking and Problem Solving
 - Innovation, Creativity, and Entrepreneurship
 - Learning to Learn/Self-Aware & Self Directed Learning
 - Collaboration
 - Communication
 - Global Citizenship



Role of Researchers

Five Broad Roles (overlap to some degree)

- ▶ Defining and Selecting Competencies
 - Defining, prioritizing
- ▶ Identifying the Intended Uses of the Measure
 - Diagnosis and remediation, achievement, informing instructional practice, monitoring system performance



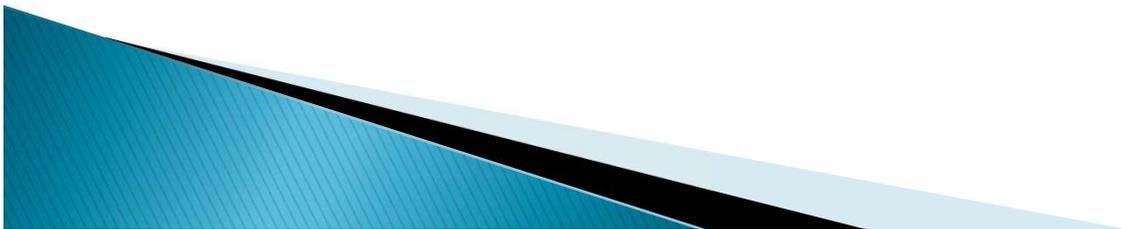
Role of Researchers

- ▶ Developing Measures & Tools
 - Data collection methods, self report scales, documenting judgement from teachers or peers, performance tasks, use of technology
- ▶ Evaluating the Technical Quality of Measures
 - Validity, reliability, fairness, new contexts
- ▶ Implementation of Assessments / Measures
 - Expected outcomes, maximize the benefits and minimize harms, gathering evidence around implementation, PD for educators re using new measures



Questions for Discussion

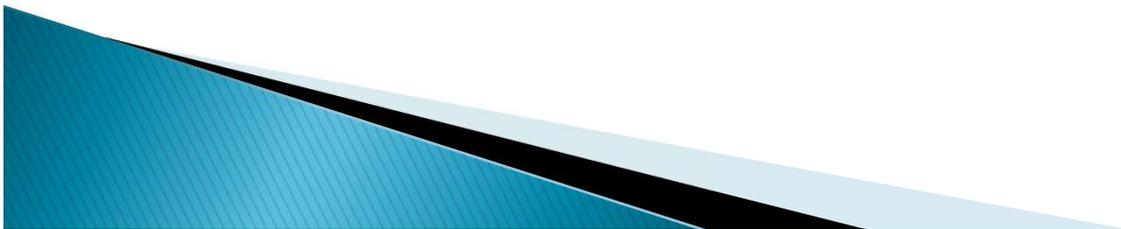
- ▶ *What role do you see yourself having in assessing 21st century competencies at your board?*



Current State of Assessment

- ▶ Embedded and authentic approaches to the assessment of students' work *require a high level of assessment competency* on the part of educators.
- ▶ Such competency is hard to develop, especially when many educators have been trained to rely on assessments developed externally, by curriculum boards, or textbook providers.

A Rich Seam, M. Fullan, 2014



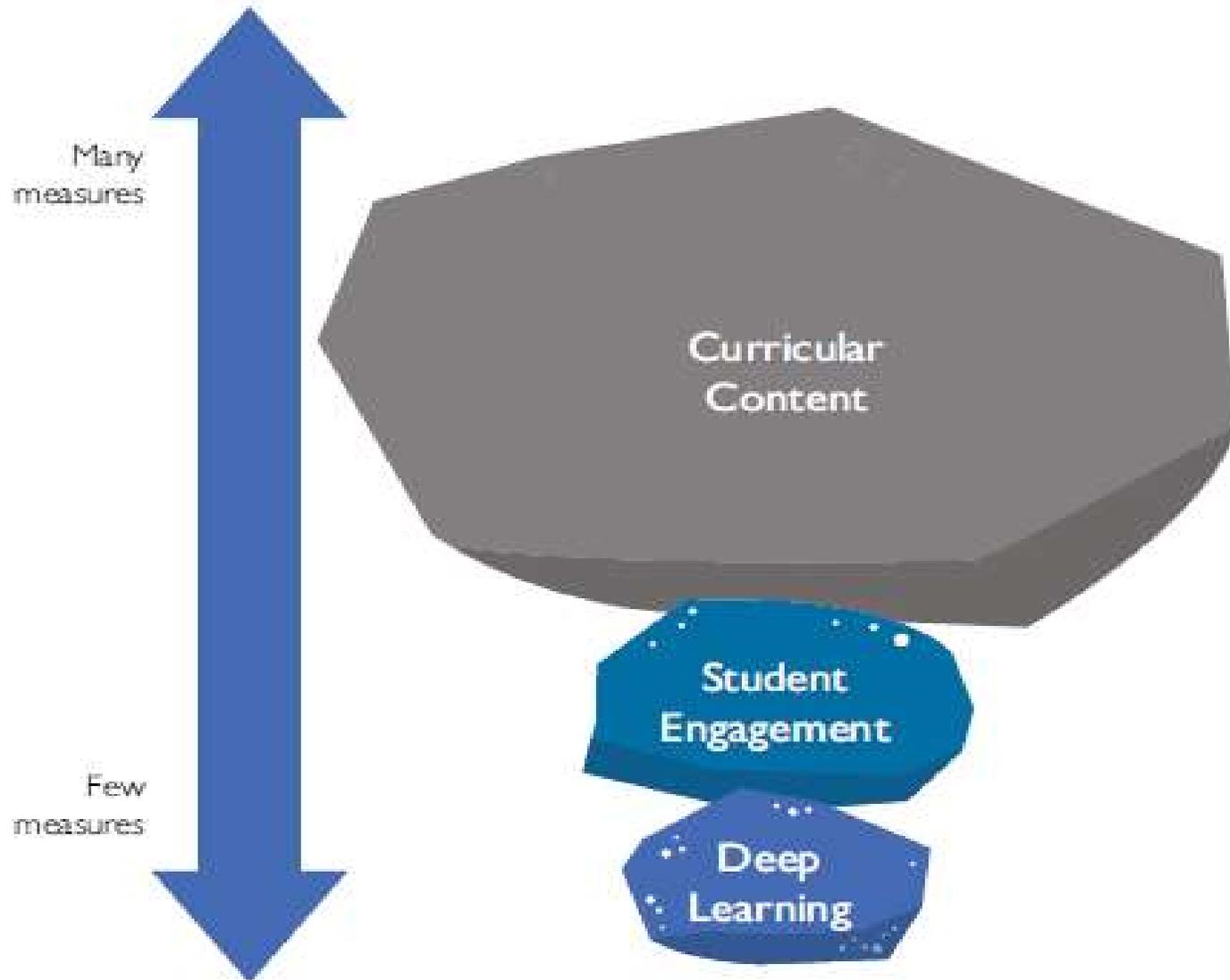
What does the assessment involve?

- ▶ *“Analyzing the quality and rigour of the products students create as part of deep learning tasks, and assessing the process through which those products were produced.”*

A Rich Seam, M. Fullan, 2014

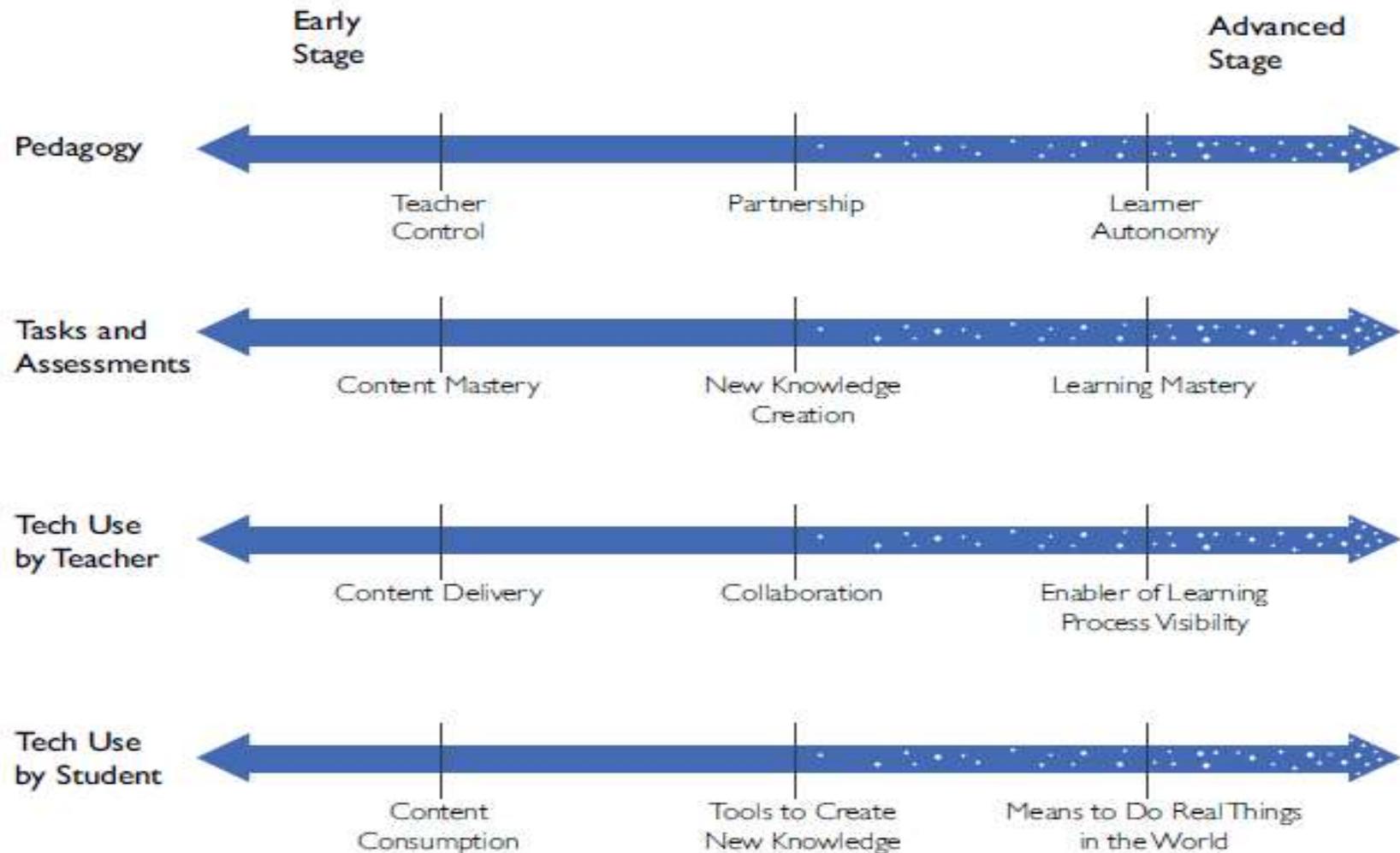


Availability of Student Assessments



Source: a Rich Seam: How New Pedagogies Find Deep Learning, 2014

Continuum of New Pedagogies Effectiveness



Source: a Rich Seam: How New Pedagogies Find Deep Learning, 2014

Future State

- ▶ Measuring deep learning competencies:
 - Students' mastery of curricular content and the learning process
 - Students' key future skills (collaboration, communication, creative thinking, etc.)
 - Students' proactive dispositions and levels of perseverance
 - Effect of students' work products on intended audiences or problems

A Rich Seam, M. Fullan, 2014



In Summary

- ▶ *“The new pedagogies must develop new measures that assess new learning outcomes as well as the practices that lead to such outcomes.”*

A Rich Seam, M. Fullan, 2014



Questions for Discussion

- ▶ *What connection or disconnection do you see between 21st century competencies and current pedagogical and assessment practices?*



Traditional Assessments

- ▶ Why? To inform the teacher:
 - How students performed – to assign a grade
- ▶ What? Products:
 - Content Knowledge
 - Organization
 - Presentation
- ▶ How?
 - Summative assessments



Assessment Continuum

Narrow Assessment

Assessment of Deeper Learning

Standardized multiple-choice tests of routine skills

Standardized tests with MC & open-ended items + short (1-2 day) performance tasks of some applied skills

Standardized performance tasks (1-2 weeks) that include structured inquiry and demand more integrated skills, including collaboration

Performance tasks that require student to formulate and carry out their own inquiries, analyze & present findings, and revise in response to feedback

Longer, deeper investigations (2-3 months) & exhibitions, including portfolios, requiring students to initiate, design conduct, analyze, revise, and present their work in multiple modalities

Source: Evolving Assessments for a 21st Century Education, 2016

Characteristics of Good Assessment

- ▶ The content of the assessment should **match** the teacher's **educational objectives** and instructional emphases.
- ▶ The assessment items should represent the full range of **knowledge** and **skills** that are the **primary targets of instruction**.
- ▶ **Expectations** for student performance should be **clear**.

NCREL:

http://web.archive.org/web/20051024083623/http://www.ncrel.org/sdrs/areas/stw_esys/4assess.htm

Formative Assessment

- inFORMS instruction (teacher)
- inFORMS students – what they know and don't know or how to do



Formative Assessment Methods

- ▶ Student Summarize Information
- ▶ Interviews
- ▶ Students conferencing
- ▶ Research journal
- ▶ Observation checklist
- ▶ Student checklist
- ▶ Reflective logs
- ▶ Journals
- ▶ Student self-assessment
- ▶ Portfolios (physical and digital collections)
- ▶ Before and after learning records
- ▶ Anecdotal observations
- ▶ Exit tickets
- ▶ *Rubrics*



Questions for Discussion

- ▶ *Based on your knowledge and experience, what do current assessment practices in relation to skills and competencies look like at your Board?*



Using Rubrics for Formative Assessment

- ▶ Observe, assess and provide feedback to students using rubrics
 - Help clarify criteria for success
 - Show what the continuum of performance looks like
 - Useful for sharing with students what they're aiming for, where they are now, and what they should do next



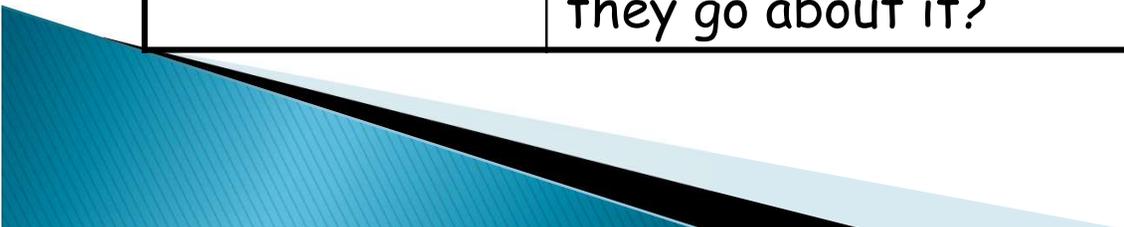
Designing Rubrics

- ▶ What Should Be Assessed?
 - What do you want students to be able to do?
 - Is the learning task or activity conducive to the skill you want to see?
 - Ask yourself: What does the successful demonstration of the skill look like?
- ▶ What criteria will you highlight?
- ▶ What should I look for?
 - The descriptors of degrees of quality in meeting the criteria



Rubric Example

| Skill/ Criteria | In Progress | Proficient | Advanced |
|-----------------------|--|------------|----------|
| Uses tools | What makes the tool appropriate ? What are the variety of tools they might choose from? Does quality or quantity equal success? | | |
| Records Notes | Quality: What do quality notes look like? Quantity: Is quantity more important than quality? | | |
| Stores Information | What were students taught? Is this an either they did it or they didn't do it thing? How did they go about it? | | |



Creative Rubric

- ▶ Define the Term Creative:

- *“Original and of high quality”* (Perkins 1981)
- *“Putting things together in new ways”* (Brookhart, 2010)



Creative Rubric

- Creative Characteristics:
 - Observe things others might miss
 - Originality of an idea
 - Construct more novel products
 - Give more novel performances
 - Use more unusual or unconventional imagery to make points
- Characteristics lead to qualities in the work that we can observe, assess and provide feedback on.

Creative Rubric

- ▶ Pedagogical Practice: Need to intentionally set the conditions so that students can demonstrate creativity
- ▶ Examples that promote creativity (Brookhart,2010):
 - Brainstorming, using a graphic organizer to identify ideas, thoughts
 - Assignments that require students to produce new ideas or reorganize existing ideas in a new way
 - Assignments that require students to switch things around, change context or time, or put two things together



Rubric for Creativity

| Qualities | Very Creative | Creative | Ordinary/ Routine | Imitative |
|-------------------------------|--|--|---|--|
| Variety of ideas and contexts | Ideas represent a startling variety of important concepts from different contexts or disciplines | Ideas represent important concepts form different contexts or disciplines | Ideas represent important concepts from the same or similar contexts or disciplines | Ideas do not represent important concepts |
| Variety of sources | Created product draws on a wide variety of sources, including different texts, media, resource persons, or personal experiences | Created product draws on a variety of sources, including different texts, media, resource persons, or personal experiences | Created product draws on a limited set of sources and media | Created product draws on only one source or on sources that are not trustworthy or appropriate |
| Combining ideas | Ideas are combined in original and surprising ways to solve a problem, address an issue, or make something new | Ideas are combined in original ways to solve a problem, address an issue, or make something new | Ideas are combined in ways that are derived from the thinking of others (e.g., authors in source consulted) | Ideas are copied or restated from the sources consulted |
| Communicating something new | Created product is interesting, new, or helpful, making an original contribution that includes identifying a previously unknown problem, issue, or purpose | Created product is interesting, new, or helpful, making an original contribution for its intended purpose (solving a problem or addressing an issue) | Created product serves its intended purpose (solving a problem or addressing an issue) | Created product does not serve its intended purpose (solving a problem or addressing an issue) |

Measuring Interpersonal Competencies

For example: communication, collaboration

- ▶ The competency is clearly described
- ▶ A subset of behaviors is selected for assessment
- ▶ A test item is replaced by a performance situation and the student has to respond or act appropriately.
- ▶ Measuring how well a student responds is done using a scale or rubric
- ▶ Rubrics have been developed for critical thinking, collaboration, and communication



Considerations

- ▶ Unlike the academic content areas, competencies / skills may not manifest themselves in an on-demand testing session or to a specific prompt.
- ▶ Using a multitude of measuring approaches is better than relying on single measure.
- ▶ Important to have a common lexicon.
- ▶ Understand how the competencies relate to one another (e.g., collaboration and how it relates to teamwork, communication, and leadership)
- ▶ Meet the needs and demands of educators in terms of logistics and practicality

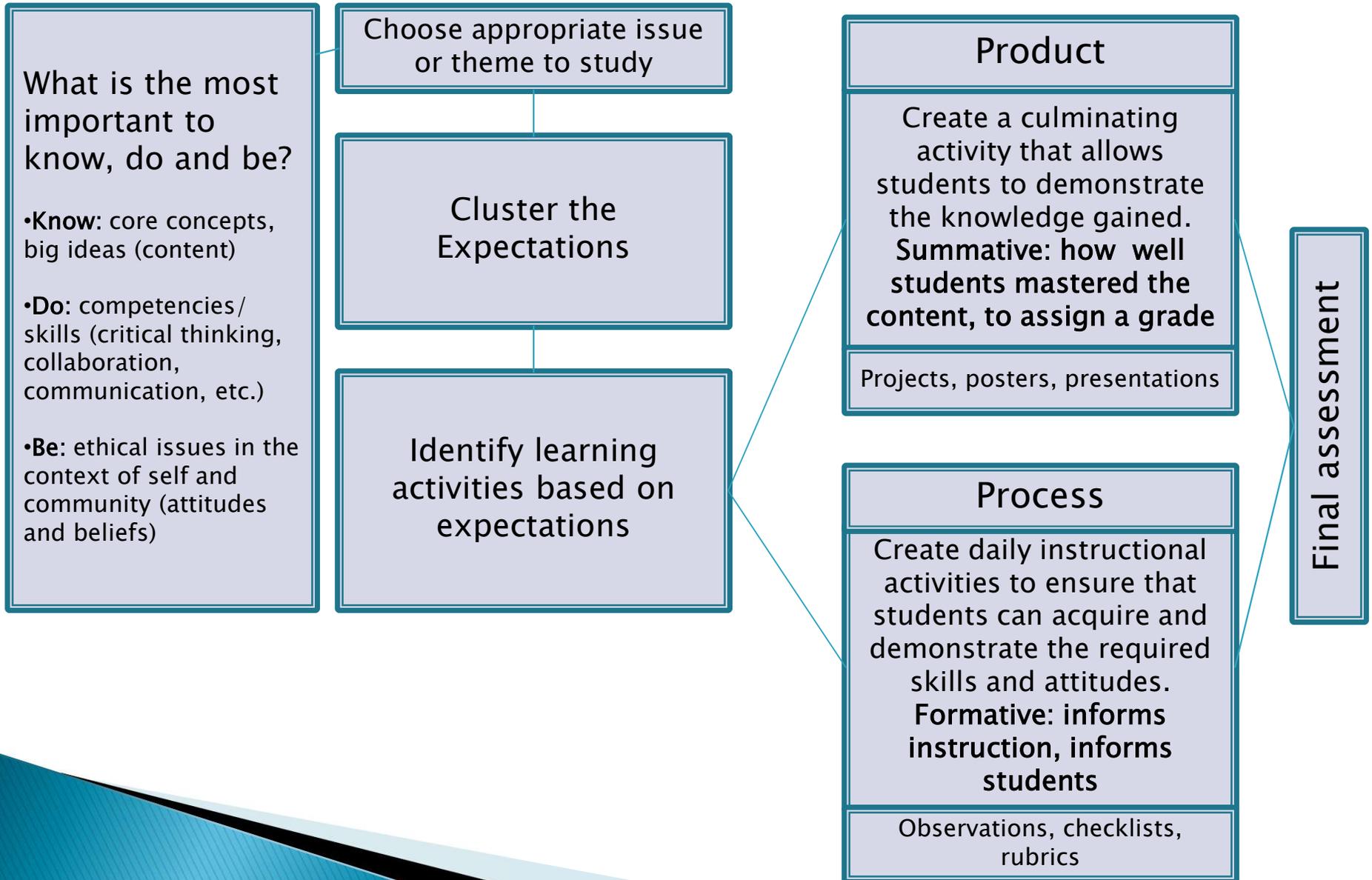


Questions for Discussion

- ▶ *How do you see yourself supporting formative assessment practices and the use of rubrics at your Board?*



Approach to Developing An Assessment Framework



Using Technology as an Enabler and Accelerator

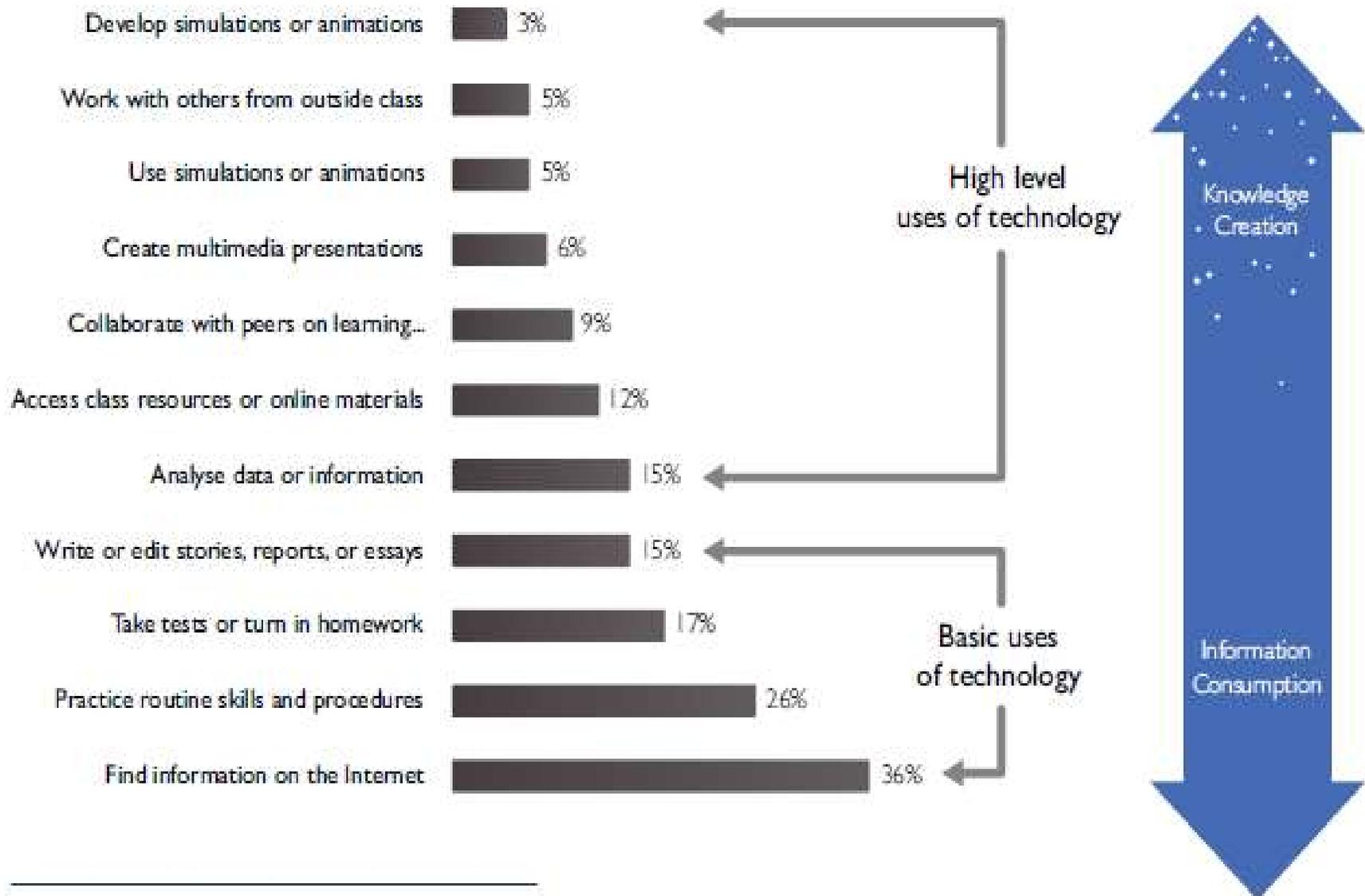


There's a key piece missing:
The link to assessment

Enabling new content discovery, local and global collaboration, and the creation and use of new knowledge in the world.

Accelerating teachers ability to put students in control of the learning process.

Technology Use and Knowledge Creation



Source: a Rich Seam: How New Pedagogies Find Deep Learning, 2014

Current Landscape

- ▶ Teachers say that the kind of deep learning that new pedagogies foster cannot be assessed by traditional standardized exams:
- ▶ *“I think assessment has to change too. We need to change assessment because right now we’re assessing knowledge that they could find on the internet. I think quality is going to be what these kids are capable of demonstrating vs. what they can remember. How can they solve problems, create things, collaborate?”*

Dianne Fitzpatrick, Cross Curricular Head of Instructional Technology, Central Peel High School, Canada

What will be our role as Researchers

In order to measure and assess, researchers will need to...

- ▶ Help answer the “why?”
- ▶ Determine the goal or objective (what are you trying to achieve or accomplish?)
- ▶ Determine how it will be done
- ▶ Help answer “What does it all mean?”
- ▶ Determine how well
- ▶ Help answer ‘where do we go from here?’



Questions Moving Forward

- ▶ How are we going to leverage technology to assess competencies and skills?
- ▶ How are we going to move system leaders from activity/project based thinking to an outcome/evidence based approach?
- ▶ How are we going to help teachers/ educators fuse pedagogy, measurement and assessment?
- ▶ How are we going to support the transition from traditional curriculum/assessment practices to future competency/skill/inquiry based curriculum and assessment practices?



Questions for Discussion

- ▶ *As researchers, what do you see as the greatest challenge in assessing 21st Century competencies?*

