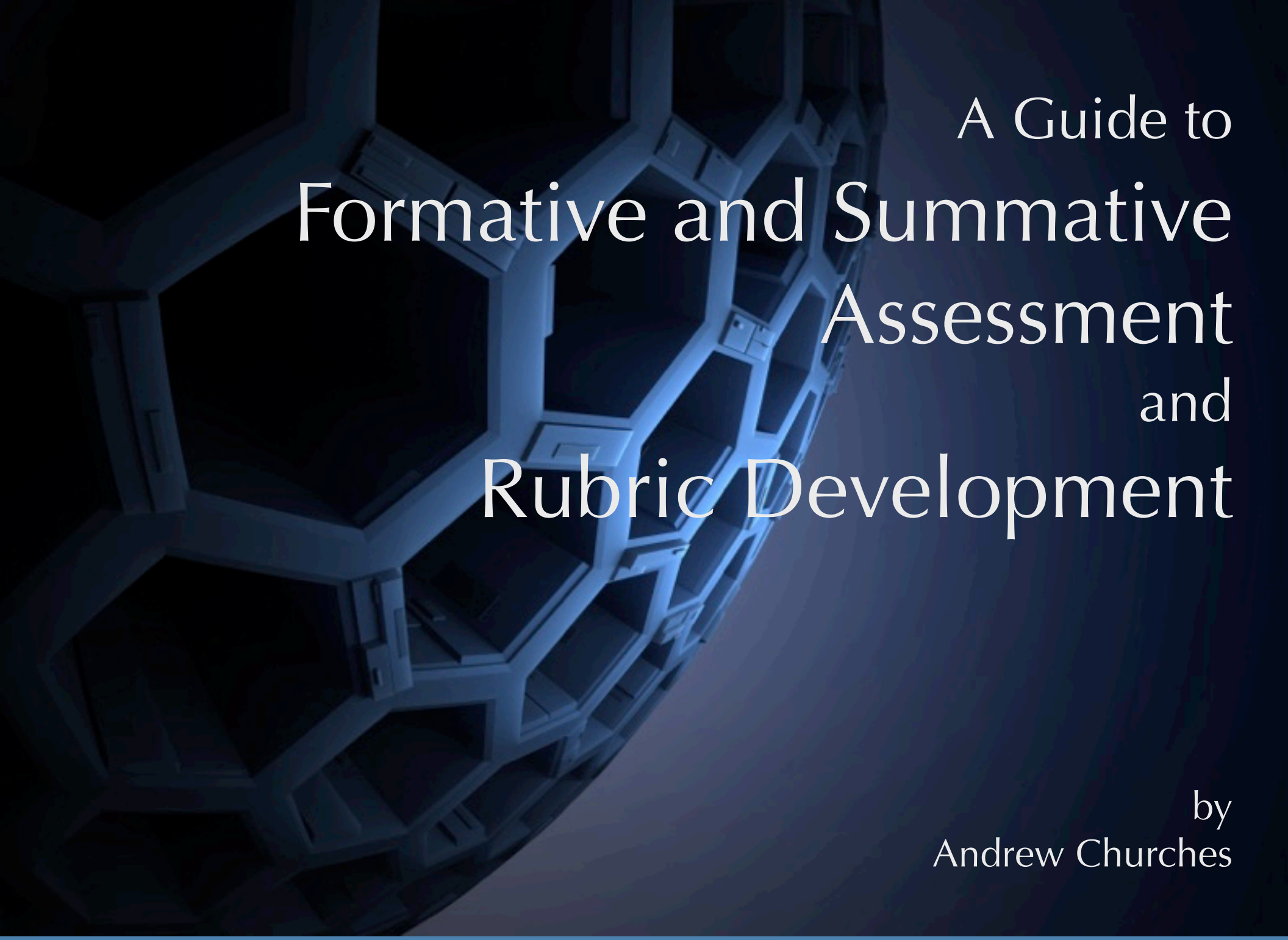


A Guide to Formative and Summative Assessment and Rubric Development

by
Andrew Churches

Introduction

Welcome to your one-stop resource for information on assessment and rubric development! In our new digital age, we know that as educators we are interacting with a different kind of student that thinks and performs on a whole new frequency, thanks to chronic technological exposure and things like InfoWhelm. Our students are truly one-of-a-kind.

This is the kind of student that requires a unique kind of assessment process, one that is relevant to instruction in the new digital age, and we're here to help.

At its heart, educational assessment is the process of documenting knowledge, skills, attitudes, and beliefs—usually in measurable terms. Assessment can focus on the individual learner, the learning community (class, workshop, or other organized group of learners), the institution, or the educational system as a whole. This assessment can be quantitative, qualitative, or both.

Remember, It is important to note that the final purposes and assessment practices in education depend on the focus and beliefs of the practitioners and researchers, their assumptions and beliefs about the nature of the human mind, the origin of knowledge, and the process of learning.

In this resource, we will take an in-depth look at types of assessment and procedures, as well as dive into the particulars of proper rubric development, geared toward giving a clear and accurate picture of the modern student's performance.

It is our hope that you enjoy this resource, and find it useful and engaging as you continue with your own evaluations. Good luck, and here we go!

Types of Assessment

Assessment is divided, for the sake of convenience, into the following distinctions:

- formative and summative
- objective and subjective
- referencing (criterion-referenced, norm-referenced, and ipsative)
- informal and formal

Formative and Summative

Assessment can be placed into formative and summative categories for the purpose of considering different objectives for assessment practices.

Formative assessment is generally carried out throughout a course or project. Also referred to as "educative assessment," it is used to aid learning. In an educational setting, formative assessment might be a teacher (or peer) or the learner providing feedback on a student's work, and would not necessarily be used for grading purposes. Formative assessments are diagnostic.

Summative assessment is generally carried out at the end of a course or project. In an educational setting, summative assessments are typically used to assign students a course grade. These types of assessments are generally evaluative.

Summative and formative assessment are often referred to in a learning context as "assessment of learning" and "assessment for learning," respectively. Assessment of learning is generally summative in nature and intended to measure learning outcomes, and report those outcomes to students, parents, and administrators.

Assessment of learning generally occurs at the conclusion of a class, course, semester, or academic year. Assessment for learning is generally formative in nature, and is used by teachers to consider approaches to teaching and next steps for individual learners and the class.

A common form of formative assessment is *diagnostic assessment*. Diagnostic assessment measures a student's current knowledge and skills to identify a suitable program of learning.

Self-assessment is a form of diagnostic assessment that involves students assessing themselves. Forward-looking assessment asks those being assessed to consider themselves in hypothetical future situations.

Performance-based assessment is similar to summative assessment as it focuses on achievement. It is often aligned with the standards-based education reform and outcomes-based education movement.

Though ideally they are significantly different from traditional multiple-choice tests, they are most commonly associated with standards-based assessment that use free-form responses to standard questions scored by human scorers on a standards-based scale of three criteria, either meeting, falling below, or exceeding a performance standard rather than being ranked on a curve.

Assessment is effective when it is interpreted and used to give directions or make decisions about next steps in the learning process.

A well-defined task is identified and students are asked to create, produce, or do something often in settings that involve real-world application of knowledge and skills. Proficiency is demonstrated by providing an extended response.

Performance formats are further differentiated into products and performances. The performance may result in a product, such as a painting, portfolio, paper, or exhibition, or it may consist of a performance, such as a speech, athletic skill, musical recital, or reading.

Objective and Subjective

Assessment (either summative or formative) is often categorized as either *objective* or *subjective*. *Objective assessment* is a form of questioning that has a single correct answer. *Subjective assessment* is a form of questioning that may have more than one correct answer (or more than one way of expressing the correct answer).

There are various types of objective and subjective questions, and include true or false answers, multiple-choice, multiple-response, and matching questions. Subjective questions also include extended-response questions and essays. Objective assessment is well suited to the increasingly popular computerized or online-assessment format.

Some have argued that the distinction between objective and subjective assessments is neither useful nor accurate because, in reality, there is no such thing as "objective" assessment. In fact, all assessments are created with inherent biases built into decisions about relevant subject matter and content, as well as cultural (class, ethnic, and gender) biases.

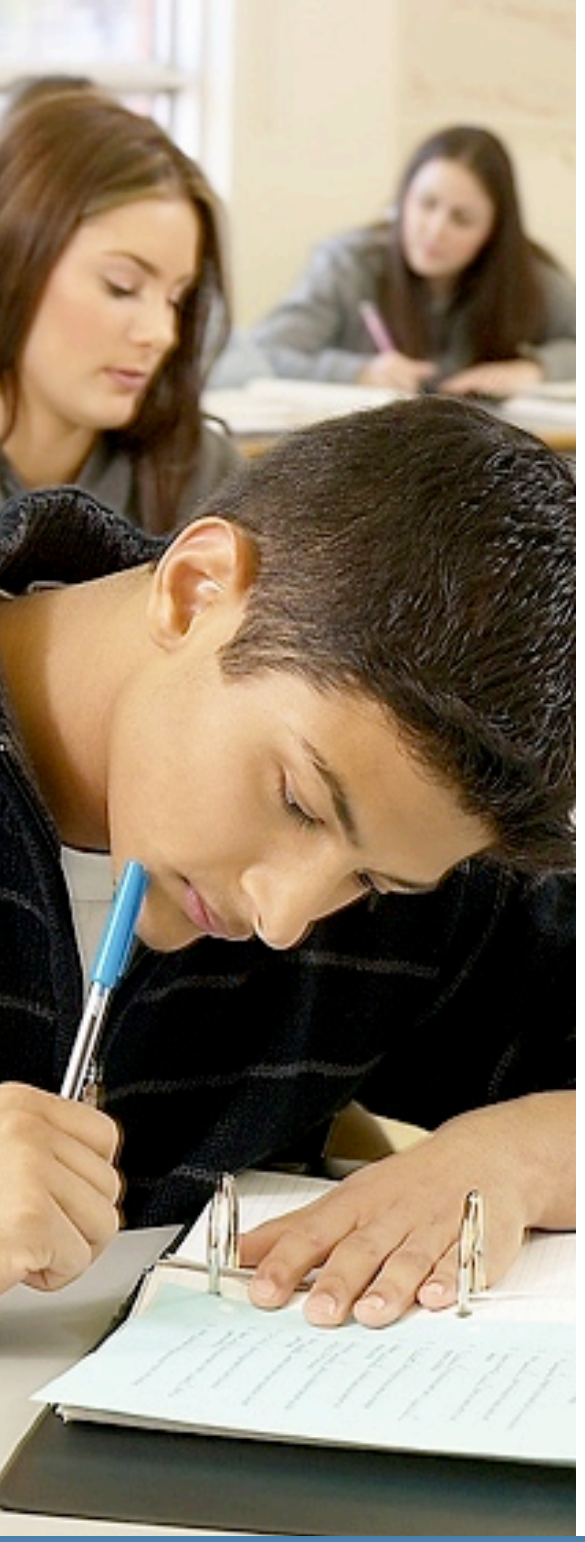
Referencing

Test results can be compared to an established criterion, to the performance of other students, or to a previous performance.

Criterion-referenced assessment, typically using a criterion-referenced test (as the name implies), occurs when candidates are measured against defined (and objective) criteria. Criterion-referenced assessment is often, but not always, used to establish a person's competence (whether he or she can do something).

The best known example of criterion-referenced assessment is the driving test. Learner drivers are measured against a range of explicit criteria (such as "not endangering other road users").

Norm-referenced assessment (colloquially known as "grading on the curve"), typically a norm-referenced test, is not measured against defined criteria. This type of assessment is relative to the student body undertaking the assessment. It is an effective way of comparing students.



The IQ test is the best known example of norm-referenced assessment. Many entrance tests to prestigious schools or universities are norm-referenced, permitting a fixed proportion of students to pass ("passing" in this context means being accepted into the school or university, rather than an explicit level of ability). This means that standards may vary from year to year, depending on the quality of the cohort. Criterion-referenced assessment does not vary from year to year (unless the criteria changes).

Informal and Formal

Assessment can be either *formal* or *informal*. *Formal assessment* usually implicates a written document, such as a test, quiz, or paper. A formal assessment is given a numerical score or grade based on a student's performance, whereas an *informal assessment* does not contribute to a student's final grade. An informal assessment usually occurs in a more casual manner and may include observation, inventories, checklists, rating scales, rubrics, performance and portfolio assessments, participation, peer- and self-evaluation, and discussion.

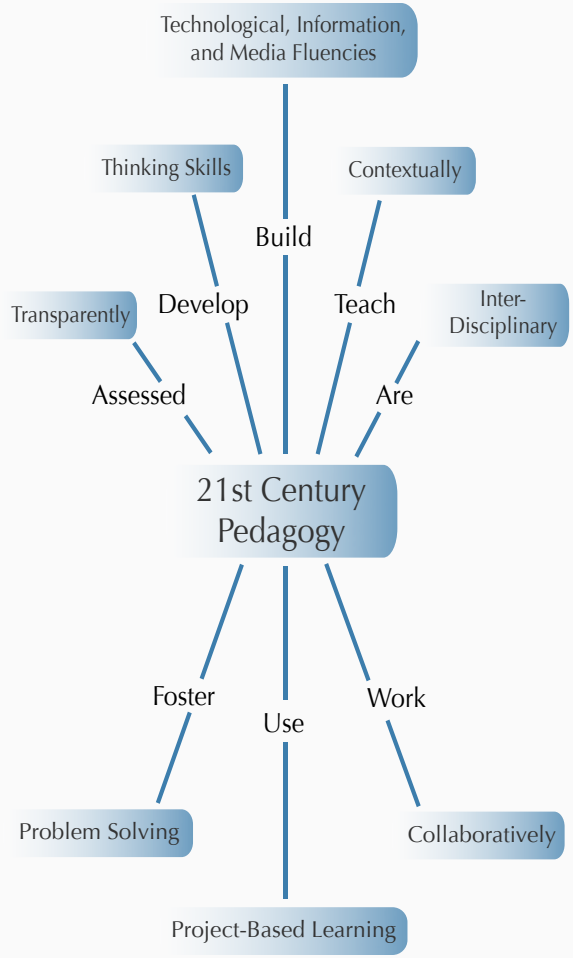
Cutting to the Chase

We often ask questions about assessment. The truth is, we assess for a variety of purposes, and these ones here are worth considering. Assessments can be used to:

- tell students how well they have learned and identify areas in which they need to develop further understanding.
- reinforce the learning process and measure success.
- determine the performance of the teacher and the school.
- determine educational performance across the country and internationally.
- determine the level of funding/resources required to get suitable educational results.
- provide employers with an understanding of students' abilities.

21st-century assessments are focused on both the learning process and the assessment outcome.

21st-Century Learning



Most of us are familiar with summative assessment. This is how our success or failure in the school system was judged. Our learning was measured in a final, or series of, examinations that were the culmination of our educational experience for the year, term, semester, and so on. Summative assessment is what our parents are familiar with as well. It is what our politicians know, and it is what employers understand.

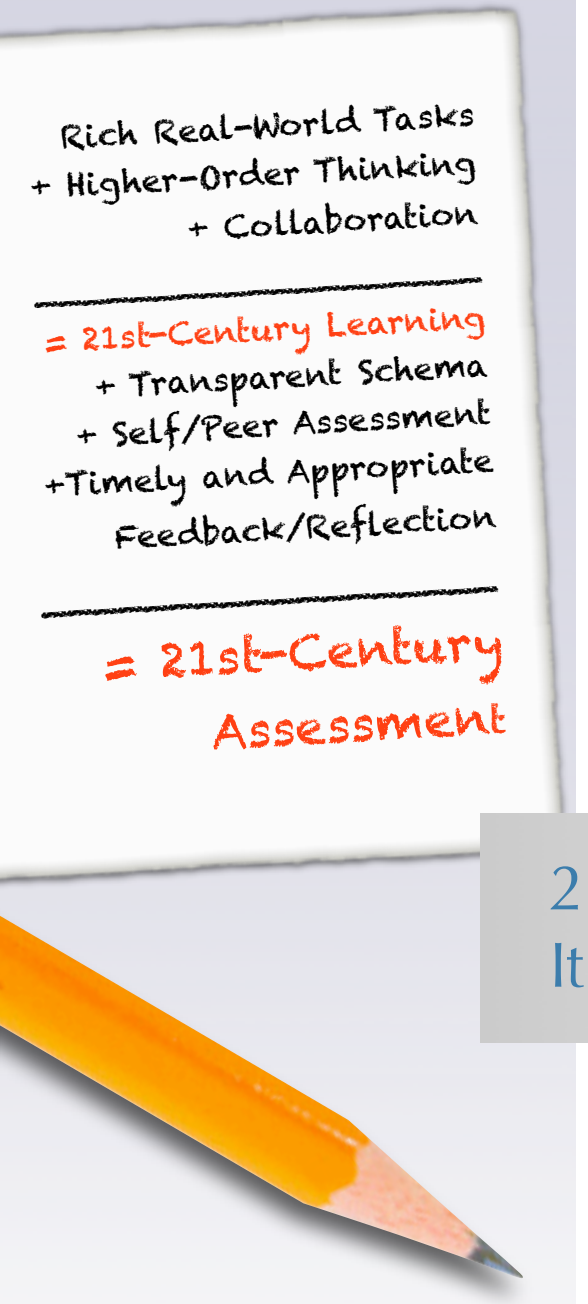
Summative assessment is used to provide snapshots of educational success (or failure). It shows school teachers and administrators, district and departmental leaders, and government officers how the school, students, and the administration are progressing and developing.

There is nothing wrong with this type of assessment as long as it is taken in the context of a snapshot—a brief learning moment frozen in time.

It is, however, a poor reflection of a student's total learning experience. How can you condense a students' learning career into one three-hour examination? And yet, this is a traditional standard approach to assessment that is employed globally.

While, in many cases, summative assessment remains unchanged, the students being assessed have changed—and significantly, we might add. They are no longer preparing to live in a world where they may have one job for their entire working lives. They are living in a world where the only constant is change. It is a world of connection and communications. They expect and demand transparency, adaptability, contextual and collaborative learning, and the opportunity to use technology. These changes shape the pedagogy we need to employ to engage and motivate our learners. To give you an idea of the projected elements, we have this demonstrated in the illustration to the left.

For the 21st-century learner, or for any learner, summative assessment is not ideal. It is not part of a learning experience and is not what they, the learners, want or expect. Formative assessment fits much better with the expectations of the students, and also with the teaching and learning outcomes schools have in place.



21st-Century Assessment

Rich Real World Tasks

Our students have the world at their fingertips. They are exposed to vast amounts of information in a variety of modes. For learning tasks to be relevant and for our students to be motivated to engage, the tasks need to be rich. Relevance refers to the purpose and objectives of the task, and to the media in which the task may be carried out.

A written report is a suitable medium and requires a certain type of literacy skill or skills. But equally as suitable are other rich media, such as video podcasts, enhanced podcasts, cartoons, and comics. These media engage students in higher-order thinking processes as they plan, design, create, and present their solutions.

Allowing students to have input into the development of the assessment is a key step to achieving student ownership and engagement. Why should our students not have involvement in assessing their own learning? The process of learning is as important as the end product. We must value the outcomes of our learning, and the process of reaching those outcomes.

21st-century assessment isn't just the assessment element. It is also inherently linked to 21st-century teaching.

Higher-Order Thinking

Our assessments should include higher-order thinking skills. Well-structured examination can assess higher-order thinking.

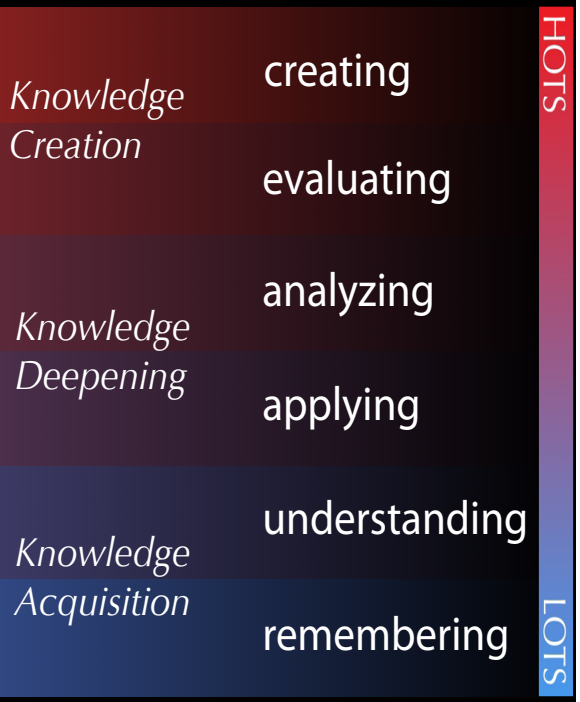
Examinations can gain a measure of the students written literacy and fluency. However, some examinations only test lower-order thinking skills.

If we were to look at the keywords commonly associated with lower-order thinking defined in Bloom's Taxonomy, they are as follows:

- list (remembering)
- state (remembering)
- identify (remembering)
- name (remembering)
- describe (remembering)
- comment (understanding)
- discuss (understanding)
- explain (understanding)
- exemplify (understanding)

Now, how often do we see these keywords forming a majority of the content of an examination? Examinations could also include:

- compare (analyze)
- analyze (analyze)
- evaluate (evaluate)
- judge (evaluate)
- review (evaluate)
- design (create)
- construct (create)
- devise (create)
- critique (evaluate)
- plan (create)
- develop (create)



All 21st-century assessments must include higher-order thinking. Of course, lower-order elements of recall and understanding are necessary in higher-order thinking as well. To be able to analyze, evaluate, or create, we must be able to understand, remember, and apply.

However, there are better modes of assessment that focus on higher-order thinking than examinations and assessments modes that are more formative. The illustration to the left shows the progression of higher-order thinking skills, based on Bloom's Digital Taxonomy and the learning process.

Collaboration

Collaboration is part of education. The ability to collaborate is a skill employers value. Students spend much of their time collaborating and communicating. They are developing fluency in a variety of media including instant messaging, texting with cell phones, chatting on their Facebook or Bebo pages, twittering, or working collaboratively on Google documents.

The UNESCO report entitled *Learning: The Treasure Within* talks about The Four Pillars of Education. Collaboration and communication are identified within each of these four pillars:

- learning to know
- learning to do
- learning to live together
- learning to be

Ian Jukes, David Warlick, Marc Prensky, and many other 21st-century educationalists emphasize the importance of collaboration. Here's the bottom line: Collaboration is not just a 21st-century skill—it's a 21st-century *essential*.

The question of equitable work contribution is raised as a reason not to do collaborative projects for assessment purposes. However, self- and peer-assessment can overcome issues. Students are often brutally honest in their appraisal of their own performance and that of their peers, though some will need coaching about being objective and "not being nice" to their friends!

Clear and Transparent Schema

Transparency is part of the learning partnership. It is absolutely vital that the students know what they are being assessed on and what their learning outcomes and goals are. It is not acceptable to hand back an assessment with pass or fail and not explain why they achieved that particular result or outcome. The best analogy for the need for transparency comes from a job interview:

> *Would you go into a job interview and not ask, "What is my role? How much will I be paid? What are my working hours? How will my work be appraised?"*

Why would we expect less from our students?

It is a worthwhile practice to involve students in developing rubrics and marking schemes. They become part of the learning process. They provide a process of goal setting that is an important part of planning for higher-order thinking skills. Student involvement in developing criteria for assessment will lead to greater ownership of the task, and increased engagement.

Timely, Appropriate Feedback/Reflection

Feedback is a crucial component of 21st-century assessment and the heart of formative assessment. Formative assessment, as we previously noted, requires feedback between the learner and the teacher. It is a partnership in which both parties must be engaged.

For an assessment to be formative, students must take the feedback and use it to adjust their learning. The feedback and assessment therefore must also be timely. You cannot learn, change, and develop if the unit of work has finished when you receive your feedback. Formative assessments are ongoing, developmental, and progressive.

The feedback the student receives is essential. The better the quality of the feedback, the better the learning outcomes for the willing student. So, by its very nature, formative assessment is detailed, developmental, timely, appropriate, and transparent. The impact of timely and appropriate feedback is enormous. Without feedback, assessment is NOT a learning activity; it is a compliance task.

Teacher feedback must be:

- **timely**—the end of the task is too late. We must provide feedback often and in detail during the process.
- **appropriate and reflective**—the feedback must reflect the students' ability, maturity, and age. It must be understandable.
- **honest and supportive**—feedback can be devastating. Our role as teachers is to nurture and shape. We must provide feedback that is honest and supportive in manner and mode. The feedback must provide encouragement to continue.
- **focused on learning**—feedback must be linked to the purpose of the task.
- **enabling**—receiving feedback without the opportunity to act upon it is frustrating, limiting, and counter-productive. Students must be able to both learn from and to apply feedback.

One of the best models of feedback I have seen is by Dr. Jodie Nyquist, who developed this model for feedback in higher education. Essentially it has five stages going from weakest to strongest.

1. Knowledge of Results (KoR)

Weak or poor feedback occurs when a student is provided only the Knowledge of their Results (KoR). This could be an examination or test score. For example, if a student scored 57% on the examination, he or she knows the grade, but does not know how to improve on it. This is what often happens with final examinations. Students receive their final grades but they have no opportunity to develop or learn.

2. Knowledge of Correct Results (KCR)

The next stage develops from the previous one. A student is given his or her KoR and is also given Knowledge of Correct Results (KCR). For example, handing back an examination or test with a grade and working through the correct answers with the students. Learners can see the difference between their answers and the correct ones. Only reading out the correct answers is not particularly useful. This is still weak feedback, but better than just giving the student a grade. Although there is some opportunity to learn, it is limited.

3. Knowledge of Correct Results and Explanation (KCR + e)

If the teacher takes the time to provide the student with an explanation of the difference between their results (KoR) and the Knowledge of Correct Results (KCR), this is a more powerful form of feedback. The learner can begin to understand and clarify the differences between what they did and what the expectations were. We call this Knowledge of Correct Results and Explanation (KCR + e)

4. KCR + e and Specific Actions to Reduce the Gap

The next stage takes the logical progression of having students know the results and the correct answer. The difference between the two have been explained and they are provided with specific actions that they can do to reduce the gap and make improvements.

5. KCR + e and Activity

The students are provided with KCR + e, specific steps to reduce the gap, and an activity that reinforces the processes, skills, concepts, or learning.

Nyquist's Model ties well with Dale's Learning Cone. According to Nyquist, the strongest form of feedback is Knowledge of Correct Results and the explanation of why the person's results and the correct results are different. Linking the feedback with an activity to practice by doing or for immediate use engages the student and reinforces the correct outcome.

From Dale's Learning Cone, the strongest activities for the retention of knowledge are using activities with immediacy or teaching others.

Self- and Peer Assessment

Students are usually frank and honest in their assessment of their own performance and that of their peers. Peer assessment supports students and teachers alike, reduces workload, and increases engagement and understanding. Student insights and observations are valued. They are important because they help the students reflect on and understand the process of their own learning. This is meta-cognition. Students often have a better grasp of group dynamics and relationships than the teacher does.

Peer assessment stresses and reinforces the importance of collaboration. Encouraging reflection and self-assessment add a powerful dimension to learning. Reflective practice is a powerful tool for teachers and students alike.

Reflecting through the use of a blog or a journal about the day's learning activities allows the students to:

- consider their actions
- reflect on decisions
- solidify concepts
- consider and plan future processes and actions

Reflective practice is an activity students and teachers should both engage in. The journey of learning never ends, really. In a sense, we are all life-time learners.

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Are We Talking the Same Language?

Here's a question for you—If you were presented with a list of command terms used frequently in assessment, could you give the same definition of what is expected as your students or fellow teachers?

Try this exercise: Write an expectation (what you would expect to see) for each of the following commonly used terms:

list, state, identify, name, describe, comment, discuss, explain, exemplify, compare, analyze, evaluate, judge, review, design, construct, create, devise, critique, plan, and develop.

Rubric Development

One of the tools we can use for providing effective feedback and, hence, formative assessment is suitable rubrics. It is critical to note that a rubric by itself can be summative. It is how and when the rubric is used and by whom that makes the difference between a rubric being an end-point summation or forming and developing the learning process.

1 to 4 ... or 4 to1?

A question that is often raised is how should a rubric be structured. If we are using a four-point rubric, should it go 1–4 (low to high) or 4–1 (high to low)? This is a decision that the school needs to make, but either rubric does the same thing.

The general description for each level of a four-point rubric may be:

- 1 = poor
- 2 = acceptable
- 3 = very good standard
- 4 = excellent

What does excellent mean? With our rubrics, we have to be realistic about what excellence is and what it means. We cannot expect perfection. Perfection is something we do not do very often and our students will seldom reach this level. Our assessments must be achievable and be clarified. Excellent means a high standard or quality moderated by the age of the learner.

Skills and Knowledge

Often, rubrics are associated with skills assessment. However, rubrics are not just for skills, projects, or processes. Rubrics are used for assessing knowledge, writing essays, or the aspects of written assignments.

For example, senior high school students are asked to evaluate the impact or problem an issue has on society. The progression through the rubric goes from lower-order thinking skills to higher-order thinking skills:

- outline
- describe
- explain
- analyze
- evaluate

Evaluation Rubric

What follows is a breakdown of an evaluation rubric, as defined on an evaluative scale ranging from 0–5. In "0", we are assuming the student either failed to submit, or did not make the minimum criteria of this rubric.

1. Outline exemplar

The students outline an issue or problem that affects society. They provide a brief account or summary. For example:

> *The disposal of electronic products as waste (e-waste) in third-world countries has environmental effects on the local environment including rivers and the soil and health effects on the workers themselves. The health effects also impact directly on the families in the community.*

2. Describe exemplar

The student describes an issue or problem that effects society. They give a detailed account:

> *The disposal of electronic products as waste (e-waste) has environmental effects on third-world countries such as Ghana, Vietnam, and Niger. The disposal is environmentally unsound and has negative effects on the local communities. It pollutes rivers and the soil and impacts the health of the workers themselves. Many of the workers suffer with heavy metal poisoning.*

The health effects also impact directly on the families in the community. The disposal of e-waste in third-world countries has ongoing long-term effects.

3. Explain exemplar

The student explains an issue or problem that effects society. The student includes causes, reasons, and mechanisms. For example:

E-waste, or electronic waste, is the disposal of electronic products such as computer systems, monitors, and televisions. Most of the e-waste is generated when obsolete electronics are replaced. Rather than disposing of the materials in the country of origin, they are exported for disposal in third-world countries, such as Ghana, Vietnam, and Niger. It costs considerably less to dispose of e-waste in these countries.

The disposal methods often involve burning circuit boards to extract the metals. These methods are unsound and cause the pollution of rivers and soil. Many of the workers suffer with heavy metal poisoning because of the disposal methods used. These health problems affect the workers, their families, and the community.

4. Analyze exemplar

The students analyze an issue or problem that affects society. The students examine the essential elements of the issue:

E-waste, or electronic waste, is the disposal of electronic products such as computer systems, monitors, and televisions. New software products and games require faster and more powerful hardware to operate properly. This leads to older hardware quickly becoming obsolete. Most of the e-waste is generated when obsolete electronics are replace. Disposal of the e-waste at the country of origin would entail considerable expense and require specialized plants to be developed to conform to environmental codes of practice.

So, rather than disposing of the materials in the country of origin, they are exported for disposal to third-world countries, such as Ghana, Vietnam, and Niger. The cost of exporting these products and their disposal is considerably lower than it would be in the developed country the product originated from.

The disposal methods are unsound because the plastic is ground into a fine powder for reuse. This poses considerable hazards when inhaled. Metals, like lead and gold, are extracted from circuit boards by burning the boards. By-products from the metal processing are dumped into rivers and streams thereby polluting the local area and surrounding communities downstream. Residual effects are often felt for long periods of time. The environmental effects on the communities, the rivers, and soil have considerable human and financial costs in addition to the impact on the local flora and fauna.

5. Evaluate exemplar

The student evaluates an issue or problem that affects society. The student examines the advantages and disadvantages and makes an appraisal:

Electronic waste (e-waste) is the disposal of electronic products such as computer systems, monitors, and televisions. New software products and games require faster and more powerful hardware to operate. For example, the new video game, Crysis, requires a Nvidia 3300 graphics adaptor as the minimum specification to play the game. While the replacement process generates revenue for the hardware and software manufacturers, it has a considerable effect on the environment. Most of the e-waste is generated when obsolete electronics are replace.

Disposal of the e-waste in the country of origin would entail considerable expense and require specialized plants to be developed to conform to environmental codes of practice. So, rather than disposing of the materials in the country of origin, they are exported for disposal in third-world countries, such as Ghana, Vietnam, and Niger.

The cost of exporting these products and their disposal is considerably lower than it would be in the developed country the product originated from. Disposal in the country of origin could cost upwards of US$20 per computer while in the third world, the disposal of the same unit would cost US$3. The disposal does provide some immediate income for the villagers disposing of the e-waste, but there is a far greater long-term cost.

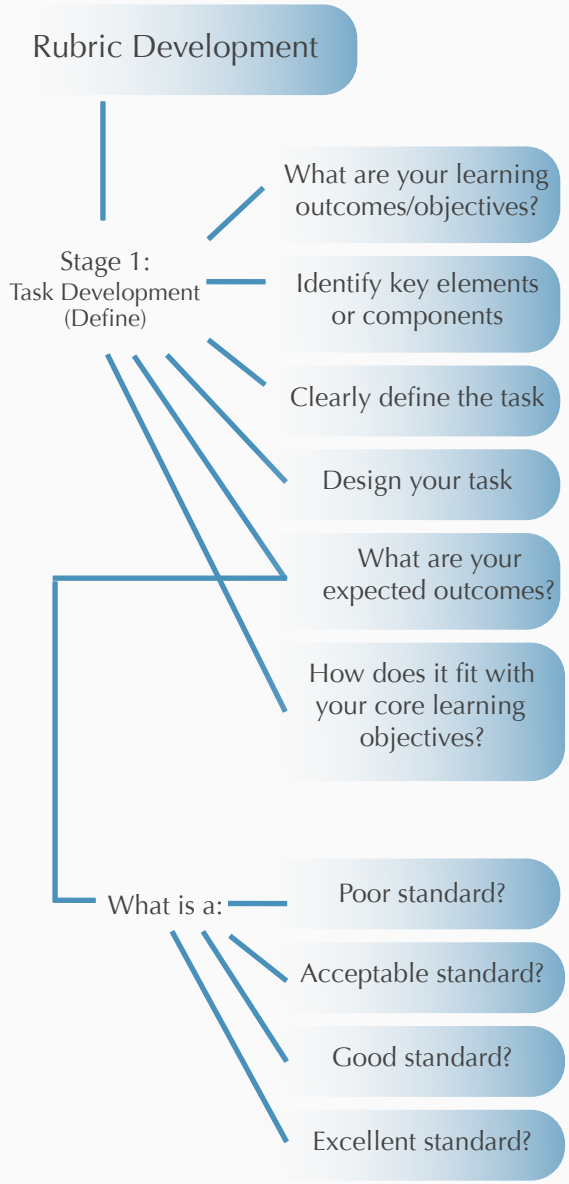
The disposal methods are unsound because the plastic is ground into a fine powder for reuse. This poses considerable hazards when inhaled. It leads to chronic and debilitating respiratory effects. Since most of these countries have no social welfare systems in place, the loss of income caused by these effects has a major impact on the families, and in turn, the communities of the effected people.

Metals, like lead and gold, are extracted from circuit boards by burning the boards. By-products from the processing are dumped into rivers and streams, greatly polluting the local area and surrounding communities downstream. The lack of water care systems compounds the problem as the streams and rivers are used as water sources for washing, ablutions, and so on. More people are exposed to the hazardous effects.

Likewise, the environmental effects on the communities have a considerable human and financial cost. The environmental costs of polluting rivers and soil impact all members of the community as well as the local flora and fauna. Many of the heavy metals are residual poisons that accumulate through the food chain and increase in concentration. Therefore, toxicity increases as the pollutants pass from trophic level to trophic level.

The symptoms of lead poisoning include abdominal pain, headache, irritability, and in severe cases, comas or death. In young children, lead poisoning can cause learning and developmental difficulties.

These disposal methods pose an immediate and ongoing hazard to the workers, the communities, and the environment.



The Stages of Rubric Development

This is an outline of a process for developing rubrics that are specific to the task the students are undertaking. This process links to the 4Ds (define, design, do, and debrief). The 4Ds approach to project-based learning can be applied to develop rubrics for both summative and formative assessment of processes, interactions, skills, and knowledge.

Stage 1—Task Development (Define)

This stage is for developing rubrics if the task is not already defined. There is a breakdown of Stage 1 in the graph pictured at the left.

1. What are the learning outcomes?

The first question to ask is, "What are the learning outcomes and Why are we doing this assessment?" If we don't need to do an assessment, then why do it?

2. Identify the key elements or components

Once the learning outcomes for the assessment have been established, the aspects of the assessment that we are gong to assess need to be identified. Are we assessing one aspect of the project development process? Are we addressing other aspects instead, such as knowledge, process, and so on?

Listed here are the 4Ds:

- define
- design
- do
- debrief

3. Clearly define the task

The next three parts of task development are intimately linked together. Here we define the assessment tasks that are linked to the project the students will undertake.

Assessment tasks, like most things in life, are best when they are straightforward and uncomplicated. A structure to consider when writing tasks and developing projects is *SMART.* This is an excellent guideline in an easy-to-remember form, and it covers off the key points that define engaging and relevant tasks. When applying SMART, determine if the task is:

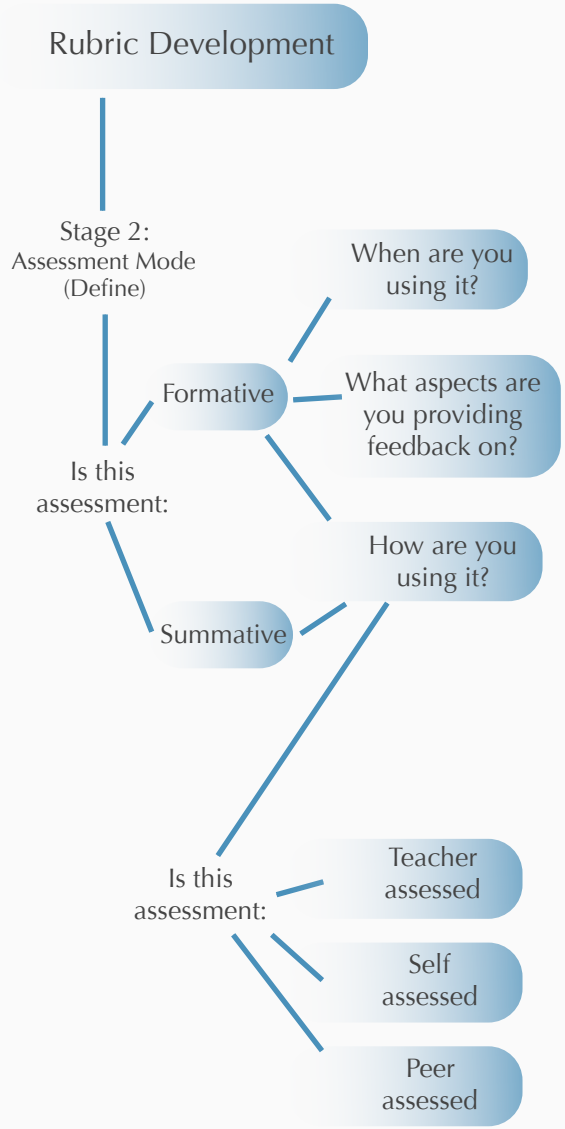
- **S**pecific
- **M**easurable
- **A**ttainable
- **R**ealistic
- **T**imely

It is best to ask, "Is this a SMART task or goal?"

4. Design the task

Again, we need to ask key questions:

- Is it suitable for the purpose?
- Does it link to the curriculum?
- Does it link to learning objective?
- Is it SMART?
- Is it suitable for the audience?
- Can students this age achieve at the highest level?



5. What are the expected outcomes?

When we set a task, we need to consider what it is we want to have our students achieve. The best results come when you have an exemplar of the outcomes you expect. If this is not available, clearly define the standards:

- Excellent standard
- Good standard
- Acceptable standard
- Poor standard
- Failing

6. How does the task fit with your core learning objectives or competencies?

Having defined and designed your task, it is useful to look back and check that it does match your core competencies and learning outcomes.

Stage 2—Assessment Mode (Design)

1. Is the task formative or summative?

The graph on the left demonstrates the proper method for undertaking Stage 2 in the development process. Assessments can be formative, summative, and sometimes both. In developing the task it is important to ask this key question.

If it's formative assessment, proceed to the questions below. If the assessment is summative, you need to determine if you are going to provide the students with the rubric prior to task completion.

2. When are you using it?

When are you planning to use this learning tool with the students? Are you going to use it once or several times? Is the rubric going to be available for the students to use throughout the whole development process? Is it transparent?

3. What aspects are you providing feedback on?

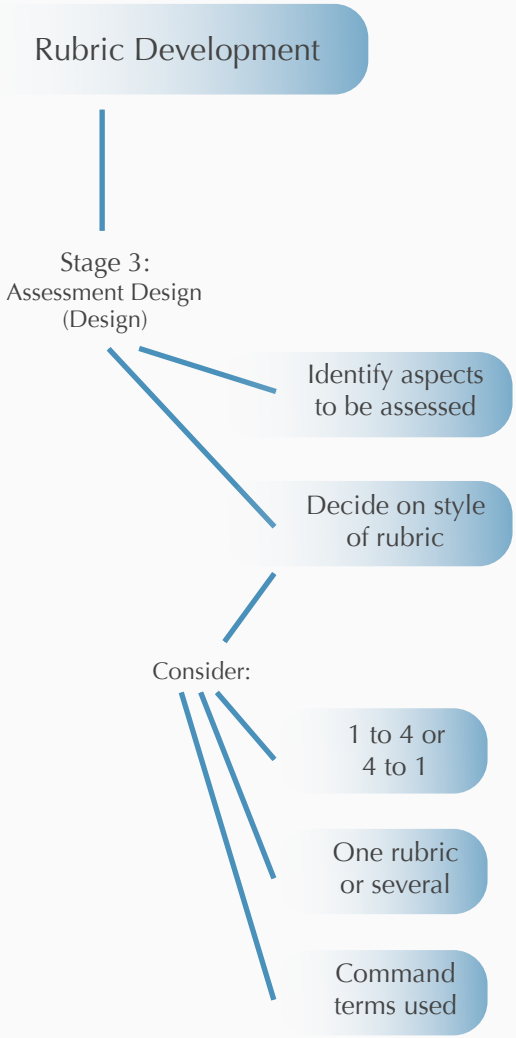
If you are assessing multiple aspects or components, which ones are you going to assess and when. Using clearly defined checkpoints will be incredibly useful in this process. Having a series of small steps or goals and latching your formative assessment to these makes the process manageable and achievable for the students. It also makes providing feedback less onerous and straight forward.

One technique that works well is to have a partial rubric that indicates whether the students are above or below the expected level. For example, the following is a part of the 4Ds generic design rubric. The criteria below is for the planning aspect:

Above minimum standard	
At minimum standard	A plan has been developed. The milestones are identified. Some are clear and achievable. The sequence of milestones, the development plan, and the information components are mostly appropriate. The tasks in collaborative projects are designated. There is some consideration of workloads for individuals. Some teacher input has been required to reach this point.
Below minimum standard	

The teacher can quickly tell the learners whether they are above, below, or at the standard for this aspect of the assessment. Using this technique makes the process manageable for the teacher.

Timely and appropriate feedback are the most powerful learning tools we have. In order for the feedback to be timely, the teacher needs to be providing feedback throughout the project process.



4. Who is assessing—self, teacher, peer, or a combination?

Students are honest—often brutally honest about their own performance. Using self- and peer assessments are powerful tools for learning.

Self- and peer assessments often provide a perspective that we, as teachers, may otherwise miss.

If the target audience of a project is students in a similar age group, they are likely to provide some of the best feedback about its suitability.

Stage 3—Assessment Design (Design)

The design phase is when the style or the layout of the rubric is worked out.

Developing the design is based on the aspects identified for assessment from Stage 1. The graph on the left breaks down the process for Stage 3.

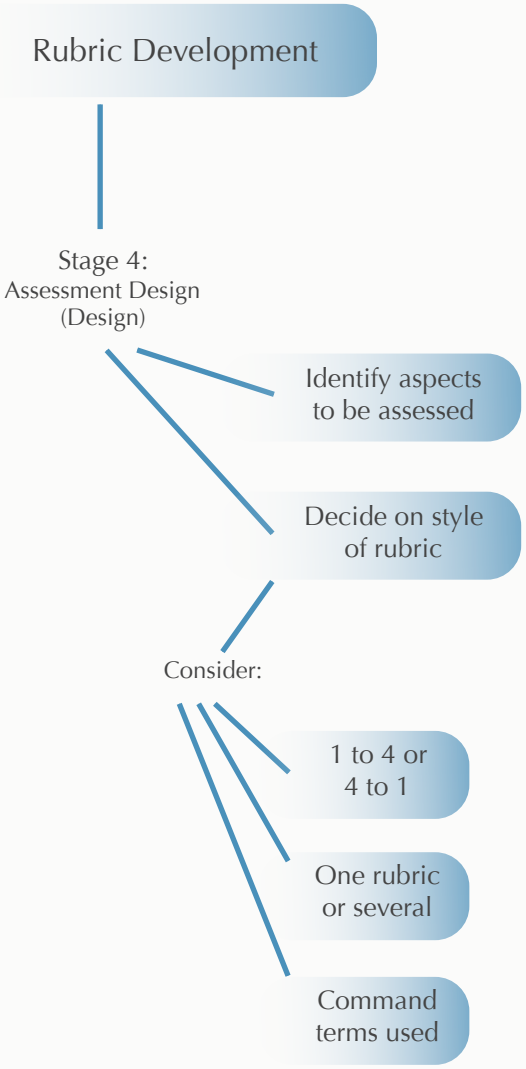
The following questions are key to designing the assessment.

1. How do you decide on rubric style?

How are you going to structure your rubric—ascending 1 to 4, or descending 4 to 1? Will you use a four-point model or do you use a smaller or larger number of criteria?

2. What command terms will be used?

It is useful to identify the command terms that you intend to use and to have a clear definition of what each term means.



Stage 4—Rubric Development (Do)

With the planning and design phases complete, it is time to make the rubric. On the left, the graph shows a good process for working this Stage 4 out. I usually work from excellent to poor. I outline the following:

- aspects being assessed
- expectation of quality and performance
- command terms
- rubric style and layout

1. Write the criteria for excellence

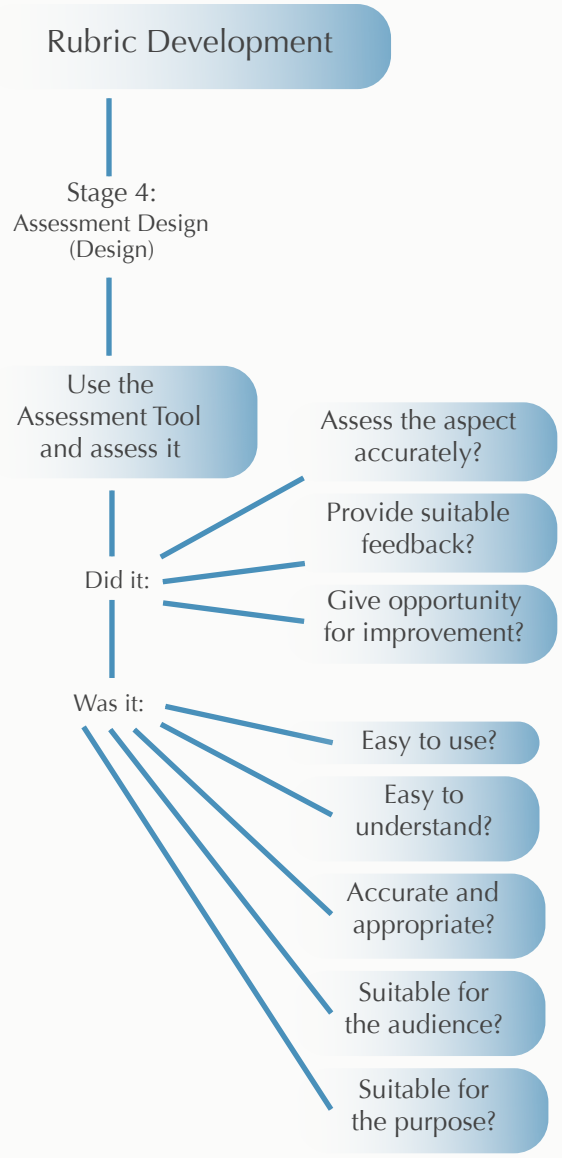
This is is where SMART goals (specific, measurable, attainable, realistic, and timely) are critical. We want our students to strive for and achieve excellence. Are the goals (criteria) you are writing suitable for the audience and suitable for the purpose? Consider the following questions:

- What are the key components?
- What are the learning objectives?
- How old are the students?
- Which command terms are we using?

2. Go from LOTS to HOTS

Does the rubric progression match with a transition from lower-order thinking skills (LOTS) to higher-order thinking skills (HOTS)?

Take Bloom's Taxonomy as an example, for instance. The hierarchy is defined on a scale that ranges from the LOTS of Remembering, Understanding, and Application, to the HOTS which constitute Analysis, Evaluation, and finally Creation.

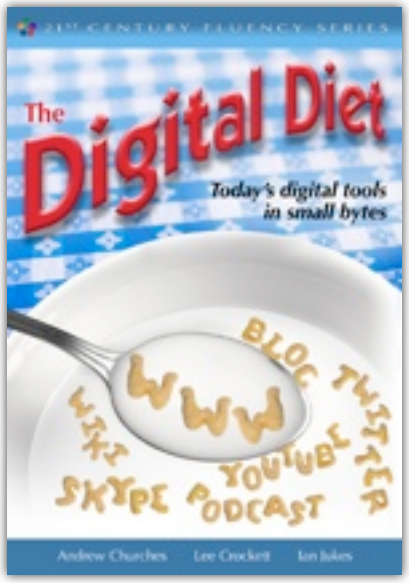


Stage 5—Use and Evaluate (Debrief)

The last stage, but probably the most important, is the debrief. Check out the graph to the left for your breakdown on Stage 5.

Having designed and used the tool, we then need to ask if it was suitable for the audience and the purpose. In addition, we can judge using these criteria:

- Did it assess the components or elements accurately?
- Did it provide suitable feedback
- Did it provide this opportunity for improvement
- Was it easy to use?
- Was it easy to understand?
- Was it clear, concise, and age appropriate?
- Was it accurate?
- Overall, was it suitable for the audience?
- Was it suitable for the purpose?



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