Work Products: Moving from Artifact to Data Source

Work products that the student produces in-class or as homework can be a powerful indicator of growth in academic skills. One significant drawback, however, is that work products such as student essays are often evaluated in a global and subjective manner. Their global focus means that work products may not provide specific information about particular skills or aspects of performance that a teacher wishes to monitor. Additionally, the high degree of subjectivity with which work products are interpreted make each evaluation unique and prevents the teacher from comparing (or charting) results across observations.

With a little effort, however, teachers can find ways to convert work products from one-of-a-kind artifacts to reliable sources of formative data suitable to monitor classroom academic interventions. The key is to define those elements of work products that (1) will yield desired information about student performance and (2) can be consistently and easily measured.

Work Products: Optimizing for Assessment. There are several ways to transform student work into a stream of objective data. If the work being evaluated is complex such as an essay, for example, the instructor can use a rubric to rate its elements and derive ratings of quality that fall along a number scale (e.g., 1= substantially below typical peer performance to 4= above typical peer performance). Or if the work product should include a set of elements, such as the steps the learner follows to solve a math word problem, the teacher can use a checklist to verify the student's completion of each problem-solving step, summing up the number of steps successfully documented as the student's 'score'.

Alternatively, the teacher may analyze the assignment directly for evidence of student performance. For example, if a student regularly turns in incomplete math homework, the instructor may track over time the percentage of assigned problems on each homework assignment that the student actually attempts as a simple but reliable metric of effort.

While there are a number of creative methods that instructors can use to transform work products into objective progress-monitoring data, they all encompass these 3 steps:

1. *Select the intervention target*. The teacher decides what student skill or performance is to be measured (the 'intervention target'). Examples include amount or accuracy of work completed, quality of the final product, and successful use of a multi-step cognitive strategy.

2. *Identify a work product that shows evidence of the intervention target.* The teacher selects a type of work product regularly produced by the student that conveys useful information about the current level of the skill or performance target. For example, a teacher may use writing assignments to track a learner's mastery of the sections of the 'keyhole' (Introduction, Body, Conclusion) essay or employ math homework to look for growth in a student's application of the steps of a cognitive strategy to solve word problems.

3. *Convert the work product to objective data.* Finally, the teacher identifies an element of the work product that can be analyzed and expressed as an objective, numeric indicator of student performance. As cited above, examples include using a checklist to verify use of a multi-step cognitive strategy, a rubric to rate the quality of a writing assignment, and a ratio of attempted to total homework problems to gauge student motivation.

Work Products: Tips for Use. Teachers can find many inventive ways to convert work products into objective data. Here are some ideas to get started:

1. *Work Accuracy: Percentage.* Tracks the accuracy of student work containing a finite number of items, such as math number problems or end-of-chapter questions. Compute by dividing the number of correct answers by the total number of assigned items. For example, a student who correctly answers 15 of 25 items attains a work accuracy: percentage score of 60% (15 correct answers / 25 problems assigned).
2. *Work Attempted: Percentage.* Measures effort on student work containing a finite number of items. Calculate by dividing the number of items attempted (whether correct or not) by the total number of items. For example, a student who attempts to provide written answers to 2 of 5 end-of-chapter questions attains a work attempted: percentage score of 40% (2 questions attempted/5 questions assigned).
3. *Work Time: Time Log.* Indicates the amount of time required to complete the assignment. Compute by (1) having the student or teacher record the student's start and end time in working on the assignment and then (2) calculating the number of elapsed minutes.
4. *Work Quality: Rubric.* Measures overall quality of the work. Calculate using teacher-made rubric or 4-point rubric included in this document.
5. *Writing: Total Words Written.* Serves as a measure of writing fluency. Count up the total number of words (irrespective of spelling) in the writing sample.
6. *Writing: Complete Sentences: Percentage.* Provides an indicator of percentage of correctly formed complete sentences in the writing sample. Calculate by (1) counting up all complete sentences and (2) dividing that figure by the total number of correct and incorrect sentences in the sample.
7. *Other.* Teachers are free to define additional targets to monitor in student work, such as number of paragraphs written or percentage of completed math problems in which the student records all intermediate steps to find the answer.