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ABSTRACT

The American College Testing Program (ACT) is field testing a portfolio assessment model. The field test is designed to determine whether it is possible to implement a portfolio assessment model on a national level that will result in scores that are of sufficient reliability and validity that they can be used for decisions at the student level. An early decision by the ACT was to develop the assessment with the direct collaboration of teachers. Representatives of national education organizations nominated schools to participate, and seven schools were selected as design partners for the development effort. Each appointed a teacher to the design team, which met to decide on a definition of the portfolio system and a concept for the field test. Eleven to 13 work sample descriptions were then developed for each of the content areas of language arts, mathematics, and science. At the beginning of the school year, the school determines five work sample descriptions that will be used for each course and students are given guidelines to help them in the formation of their portfolios, which eventually will include an item for each of the work sample areas. The five entries and the student's self-reflective letter are sent to the ACT for scoring. Pilot implementation and study with 35 teachers resulted in a revised system that 22 schools will test in the 1995-96 school year. (Contains 1 table and 10 references.) (SLD)

The Design and Field Test of the ACT Portfolio system[1]

Mark D. Reckase
ACT

The use of portfolios of students' work to reveal the skills and knowledge that they have acquired through their educational experience is not a new concepts. Kneeshaw (1992) reports that as early as 1977 the Ministry of Education for the Province of Ontario encouraged teachers to establish "writing folders" to support instruction and evaluation. Since that time, portfolios have been used for various assessment activities with mixed results (Condon & Hamp-Lyons, 1994; Elbow & Belanoff, 1986; Koretz, McCaffrey, Klein, Bell, & Stecher, 1992). Callahan (1995) presents a very thorough summary of these applications and the issues involved in sound portfolio use so they will not be repeated here. Suffice it to say that portfolio applications to assessment have varied in their success, and there is not a single model for portfolio assessment. This history of portfolio use raises the question of whether it is possible to successfully implement an assessment model based on portfolios on a large scale. If the answer is yes, what are the characteristics of the successful portfolio assessment model?

The purpose of this paper is to describe a portfolio assessment model that is being field tested by ACT. The field test has the goal of determining whether it is

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possible to implement a portfolio assessment model on a national level that will result in scores that are of sufficient reliability and validity that they can be used for decisions at the student level. The process used for designing the model and the specific design features of the portfolio assessment system that resulted are presented here. Other papers in this session (Miller & Hsu, 1996; Welch, 1996; Wolfe, 1996) summarize some of the results that have been obtained from a pilot test of this system during the 1994/95 academic year. A fairly elaborate field test of this system is occurring during the 1995/96 academic year. The details of both of these studies will be presented following the description of the system components.

The Design Process

Design Partners

Because the use of portfolios has been found to be time consuming (Fontana, 1995) and to have its genesis as an instructional tool, an early decision in the ACT Portfolio Project was to develop the design for the system with the direct collaboration of teachers. Once that decision had been made, the question arose as to how the teachers that would be part of the project would be identified. Since one of the goals of the project was to develop a portfolio model that could be used throughout the United States, teachers that were involved in the development process should be from a cross section of schools from the country. Enough teachers should be involved so that issues that were critical to the design of the system would be identified and

addressed, but a relatively small group was desired so that a strong working relationship would develop.

The process for selecting the teachers was to ask representatives of a number of national education organizations to nominate schools to participate in the project that had an interest in innovation and that had a history of providing teachers with the time for staff development and other enrichment activities. A letter and application form were sent to the principals of the nominated schools. From those that returned the rather lengthy application form, seven were selected to be Design Partners for the ACT Portfolio Project. Table 1 lists the Design Partner Schools that were selected.

Insert Table 1 about here

Each of the Design Partner Schools agreed to appoint a teacher to the Design Team, to pay for substitute time for the teacher, and to be part of the project for three years. Project membership required that the schools pilot and field test the portfolio system at their school. Students would be asked to produce portfolios of their work and submit them to ACT for evaluation. The schools agreed to these arrangements before the portfolio system had been designed. They either had a high level of confidence in ACT or had principals that were risk takers, or both.

In selecting the Design Partner Schools, the goal was to include schools that represented different types of communities, different parts of the country, and different

educational systems. After having worked with the schools for over two years, we believe these goals had been achieved.

Design Components

Work on the design of the ACT Portfolio system began during the Summer of 1994. At that time, the Design Partners and three portfolio consultants met with the ACT Development Team to define the basic parameters of the System. Three tasks were accomplished at the initial design meetings. First, the Design Partners, consultants and ACT staff agreed on a definition of portfolio that would be used as the basis for the design. After reviewing many different definitions that were available in the literature on portfolios, the definition proposed by Meyer, Schuman & Angello (1990) was selected for use. Their definition is presented below:

> A portfolio is a purposeful collection of student work that tells the story of the student's efforts, progress, or achievement in given areas. This collection must include
> (1) student participation in selection of portfolio content;
> (2) the guidelines for selection;
> (3) the criteria for judging merit;
> (4) and evidence for student self-reflection.

The Design Team particularly liked that the definition called for a "purposeful" collection and the "story" of progress. Other critical features were "student participation in selection" and "student self-reflection."

In addition to the requirements of the definition, the Design Team also agreed on the following design assumptions:

1. The contents of the portfolios should provide evidence that students have acquired skills related to national curriculum standards.

2. Portfolio development should be embedded within classroom instruction so that it represents actual student work and so that it did not require substantial extra efforts by the teachers and the students.

3. The portfolio system should be flexible so that it can be used in a variety of educational settings.

4. The portfolio system should have sufficient structure that reliable evaluations of student work can be obtained.

5. Initially, the portfolio system will focus on language arts, mathematics, and science.

There was also an expectation that the portfolio system would evolve over time as the teachers and schools gained experience with initial system design. The Design Team believed that what they were attempting was sufficiently new that initial design concepts would likely need to be modified. Revision should be accepted as a natural process of design rather than as a problem to be avoided.

System Design

After agreeing on assumptions and a definition, the Design Team worked to develop a concept that would meet all of the requirements. The balance between structure and flexibility was particularly challenging to achieve. The ultimate result, which was tried out in the first pilot test, was to develop a menu of portfolio components called "Work Sample Descriptions" from which each school, and possibly each class, could select the structure for the portfolio.

A Work Sample Description is a general statement of an educational outcome. For example, the following is a Work Sample Description for mathematics:

> Choose a piece of work that demonstrates your ability to make connections between two (or among more than two) branches of mathematics (for example, an algebraic proof of a geometry theorem or a graphic solution to an algebraic problem).

The Work Sample Descriptions are sufficiently general that they will apply to any mathematics course from grades 9 to 12 and a wide variety of student work will be responsive to the requirements of the Description. The Work Sample Descriptions are not prompts in that no specific assignment is given. Rather, the provide a framework for selecting work samples to demonstrate the student's capabilities.

Eleven to 13 Work Sample Descriptions have been developed for each of the content areas of language arts, mathematics, and science. Some of the Work Sample Descriptions cross the usual content boundaries -- for example, mathematics applied to science material -- as well as more traditional content based tasks and skills. The Work Sample Descriptions were developed from a detailed analysis of the national curriculum standards and state curriculum frameworks so that they meet the requirement to assess the content of the curriculum standards.

While the menu of Work Sample Descriptions was expected to provide the match to the curriculum standards and the flexibility requirement by allowing schools to design their own portfolios, there was also a need to provide enough structure to allow reliable student-level scores to be obtained from the portfolios. To meet that goal, the Portfolio System was designed based on selecting five Work Sample Descriptions from the menu. A theoretical analyses presented by Reckase (1995)

suggest that if five entries in a portfolio are separately scored, the composite score from the portfolio should have a reliability that is sufficiently high to support reporting at the student level.

Given these design decisions, the Portfolio System functions in the following way. At the beginning of the academic year, the school determines the five Work Sample Descriptions that will be used for each course or combination of courses. This can be done by the teachers, by school committees composed of parents, teachers, and administrators, or by whatever other process the school chooses. Once the Work Sample Descriptions are selected for the course, the teacher reviews the lesson plans to determine which class activities match the Work Sample Descriptions. There should be at least two activities that match each description so that the students will have a selection of work to choose from for the portfolio.

At the beginning of the school year, the students are given a handbook that includes the Work Sample Descriptions that will guide the formation of their portfolios. They also receive instructions about the final form of the portfolio and how the selection of materials will be scheduled. During the year, the students temporarily store materials in the portfolio folder. At the end of the course, or the academic year, the students select the final entries for the portfolio, one for each Work Sample Description, and write a self-reflective letter addressed to the reader of the portfolio that explains why each entry was selected and what it tells about his or her abilities.

The five entries and letter are packaged along with demographic information and sent to ACT for scoring. Each Work Sample Description has a six-point scoring

rubric designed to match the requirements of that Work Sample. In the scoring process, each Work Sample is scored and the portfolio is given an additional holistic portfolio score using a four-point rubric. For the pilot and field tests of the Portfolio System, the five entry scores and holistic score are reported back to the school. The full portfolios are also returned to the school.

Future reporting of the portfolio evaluations is expected to use scale scores that take into account the differing levels of difficult and dimensionality of the various Work Sample Descriptions. Initial work on the scaling is presented in Miller and Hsu (1996).

Along with the basic structure for the Portfolio System, the Design Team recommended that in-service training be made available to help teachers implement the system and understand the scoring process. To meet these needs, two workshops have been developed to support the portfolio process. The first is called the Facilitator's Workshop. Each school that uses the System is required to have a facilitator at their site. This person, usually a teacher that will be using the Portfolio System, participates in a two-and-a-half day workshop that not only covers all of the details of the System, but also provides materials to support a workshop at the facilitator's school. The expectation is that the facilitator will return to their school and inform all teachers that will be using the System about the meaning of the Work Sample Description, and about the details of implementing the process.

The second workshop presents the portfolio scoring process to one teacher in each curriculum area from each school. The purpose for this workshop is to have teachers become familiar with the criteria used to evaluate the portfolios and to

provide input into the scoring process. This workshop is not meant to train teachers to score the portfolios, but only to inform them about how they will be scored.

The scoring of the portfolios is done through a rigorous process using highly trained individuals with expertise in the appropriate content area. All of the entries for a particular work sample are scored before the next one is started. Readers are trained prior to scoring each work sample, and scoring accuracy is carefully monitored.

The Tryout Process

Beginning in the Fall of 1994, the seven Design Partner schools began implementing the Portfolio System with teachers and students in each of the three content areas. Facilitators were trained for each of the schools, and materials for participating teachers and students were sent to the schools. Thirty-five teachers participated in the pilot study. Since this was the first implementation of a new design, the materials were necessarily less polished than they are now. Work Sample Descriptions were revised during the school year in response to recommendations from the teachers and consultants. The newness of the process and the frequent revisions caused some confusion, nonetheless several thousand portfolios were sent to ACT for scoring in the Spring of 1995.

Information from the pilot implementation and the initial scoring was used to revise the system for a larger field test during the 1995/96 academic year. Twenty two schools are currently involved in the field test. During August, 1995 the facilitators for each of these schools attending workshops and these facilitators returned to their

schools to assist their teachers with implementation of the system. During February, 1996, the scoring process workshop was held with 53 teachers from the 22 schools. This Spring, approximately 13,000 portfolios are expected to be shipped from the schools to ACT for scoring. The experience from the field test year and the scoring activities will be used to further refine the Portfolio System.

Summary

The purpose of this paper is to describe the initial development of the ACT Portfolio System and to present the current structure of the System. The ACT Portfolio is a system for collecting students' class work in one or more of the areas of language arts, mathematics, and science. Structure is imposed on the portfolio by requiring that the portfolio entries conform to general criteria called Work Sample Descriptions. A specific course related portfolio is designed by selecting five Work Sample Descriptions from a menu of descriptions that has been developed to match the national curriculum standards.

The portfolios also include a self-reflective letter from the student to the reader that indicates why the entries were selected and what they tell about the student. Each entry and the overall portfolio are scored according to rubrics that are specific to each Work Sample Description and each content area.

The Portfolio System also includes staff development activities for school staff to cultivate local expertise in the portfolio system and to indicate the procedures used to score the portfolios. The System has gone through a pilot test and now is

undergoing a field test at 22 high schools. The System is being continually evaluated and revised. The goal is to produce a system that will meet the needs of the schools and that will provide reliable information about student capabilities.

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Table 1

Design Partner High Schools

- Du Sable High School -- Chicago, Illinois
- Cherry Creek High School -- Cherry Creek, Colorado
- Branford High School -- Branford, Connecticut
- Libertyville High School -- Libertyville, Illinois
- Culver City High School -- Culver City, California
- Mountlake Terrace High School -- Mountlake Terrace, WA
- Tupelo High School -- Tupelo, Mississippi

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