

## Snapshot #31

### **Restructuring at the Secondary Level: Grouping, Instruction, and Assessment**

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Yorktown, Virginia**

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## **Research Findings**

York High School has been focused on creating a meaningful learning environment for their students for several years. Two recent efforts have included a project for improving math and science assessments, and grouping the freshman class and its faculty into smaller interdisciplinary groups. The research that supports these efforts can be found in the *Effective Schooling Research Practices: A Research Synthesis/1990 Update* (Northwest Regional Educational Laboratory, April 1990). Some of the relevant classroom and school-wide practices related to their activities include:

### *1.3.1 Students are Carefully Oriented to Lessons*

### *1.3.4 Students Routinely Receive Feedback and Reinforcement Regarding Their Learning Progress*

- e. Teachers make use of peer evaluation techniques (e.g., in written composition) as a means of providing feedback and guidance to students.

### *1.5.1 Learning Progress Is Monitored Closely*

- a. Teachers regularly monitor student learning, both formally and informally.
- d. Classroom assessments of student performance match learning objectives.
- e. Teachers are knowledgeable about test development techniques and apply these to select or prepare valid, reliable assessment instruments.

g. Teachers use assessment results not only to evaluate students but also for instructional diagnosis and to find out if teaching methods are working.

h. Grading scales and mastery standards are set high to promote excellence.

### *2.1.2 The Curriculum Is Based on Clear Goals and Objectives*

b. Clear relationships among learning goals, instructional activities, and student assessment are established and written down.

c. Collaborative curriculum planning and decision making are typical.

### *3.3 Staff Engage in Ongoing Professional Development and Collegial Learning*

a. Resources are made available to support ongoing programs of professional development.

b. Collegiality is the norm; it is expected that staff members will routinely share ideas and work together toward the end of improving the instructional program.

## **Situation**

York High School is located in historic Yorktown, Virginia. Situated near the eastern shore and close to the large military installations in Norfolk, Yorktown is also only a short distance from Washington, DC. The 1100-member student body is ethnically mixed, mostly white and African-American, with the majority of students coming from middle-class families. York is one of three high schools in a countywide system, and the students score on the average at about the 69th percentile on norm-referenced standardized tests.

Since 1988, many awards and grants have been received by York High School in recognition of its continual effort to improve the performance of both its teachers and its students. For example, in 1993, York High School was selected as a visitation site by the Southern Regional Education Board; as the first school in Virginia to be a member of the Coalition of Essential Schools; as one of twenty-five schools in Virginia to be a "High Schools That Work" site; and the only high school in the state of Virginia to be a partner with the Center for Staff Development, which entitled them to receive up to \$40,000 in staff development money.

## **Context**

York High School is one of eleven schools, K-12, that have been involved in a project in cooperation with the Virginia Education Association, the Appalachia Educational Laboratory, the National Education Association, and the Virginia Department of Education since 1992. A study group made up of eleven teams, two of which were from York, was formed, and members planned and developed the document *Alternative Assessments in Math and Science: Moving toward A Moving Target*. This project asked participants to develop alternative assessments, implement classroom strategies, record reflections and reactions, analyze data, and write and edit products related to these activities.

York principal Dr. Barry Beers was recognized as Virginia Outstanding Principal of the Year in 1992. His six years at York have been directed at facilitating the change process "with a

competent, hard-working staff which has the ability and desire to improve." The strategic restructuring process began with an external analysis of the literature to see what research and forward-thinking experts are saying about the educational and skill needs of the future. An internal analysis looked at all available data to assess student performance at York. Goals and objectives for improving the school were established, and results of the 1990-1993 efforts were recorded. Plans for 1993-1996 are also clearly defined.

In addition to the math and assessment project, York High School developed a strategic plan for restructuring, which has, among many other things, called for regrouping the ninth and tenth grades into smaller clusters of students with an interdisciplinary team of teachers assigned to each group. This staff also looks for innovative ways to integrate the curriculum and to design more meaningful learning activities for students. Lower-track classes in math, English, and science have been virtually eliminated, and higher expectations have been established for student achievement.

There is a growing awareness in the nation's high schools and school districts that the goals of schooling are changing. Employers are asking for employees who can think critically and work collaboratively to solve problems. If schools and their communities believe that students need to become self-directed learners, complex thinkers, community contributors, collaborative workers, and quality producers, then new ways of teaching and assessing those abilities must be developed. York High School staff are exploring ways to do just that. The intention of the school's work in math and science is to create assessments that call for students to use skills in real applications, and teachers to expand the scope of their instructional and assessment strategies, as well as motivating students to reach high levels of achievement.

According to the Executive Summary portion of the report, *Alternative Assessments in Math and Science: Moving Toward a Moving Target*, "Alternative assessment may offer a solution to the dilemma of monitoring and facilitating learning in a realistic and meaningful manner." The study group members, after six months of developing and implementing alternative assessments in their classrooms, stated that implementation strategies should include:

- Planning assessments as instruction
- Having a partner with whom to share ideas and reflections
- Developing generic rubrics to avoid "reinventing the wheel"
- Expecting to learn by trial and error
- Trying student peer assessment
- Using cooperative grouping for completing assessment tasks.

Although no student data were available on any of the assessment tasks except as individual scores given to students, the findings from the study in which the York High School teachers participated included reflections on the following topics:

- **Student Achievement.** More than three-fourths of the study group participants reported that student grades improved. It was commonly observed that group interactions, cooperation on group tasks, oral and written communication performance, organizational skills, and student accountability increased.
- **Student Attitude.** All of the study group participants reported improvement in student attitudes toward school work. Student involvement in classroom learning activities also increased.
- **Instructional Practice.** Instruction became more integrated in nature and moved from teacher driven to student centered. For teachers, facilitating learning became more

important than dispensing information.

- **Teacher Effectiveness.** Students and their parents appreciated the variety of assessment tasks devised and used by teachers that played to student strengths and increased learning.

## **Practice: Math and Science Instruction and Assessment**

Two pairs of teachers-math teachers Mary Deal and Linda Hite, and science teachers Vicky Reid and Maxine Bayly-were chosen for the study group team who were to be part of the Alternative Assessments in Math and Science training program. The pairs chosen from each of the schools had to meet certain requirements including (1) the desire to write, (2) some knowledge about alternative forms of assessment or desire to learn about them, (3) a colleague in the same school who would like to work collaboratively on the project, and (4) support of the school administration for released time, opportunities to share with colleagues, and plan with partners as needed to participate in the two-year project. Their training in alternative assessment began in January 1992. Besides the development and implementation of alternative assessment, they were to record their reflections on this process in journals or weekly summary sheets in subsequent meetings.

Deal and Hite developed a series of math tasks, each of which included an objective, an appropriate grade level or course, materials needed, a description of the activity, a scoring rubric and a method of evaluation. Many of the activities are designed for the students to do outside of the classroom and often require that the students be prepared to present their project to the class. Deal and Hite write that, "In problem solving settings outside of the classroom, an individual needs skills to decide what tools to use, what information is pertinent, how the information should be organized, what parameters restrict the solution, which ideas should be explored and which should be discarded. At the end of this processing of information, the students must learn how to communicate the results to others. By using alternative modes of assessment, one can help students develop these skills."

The tasks include such things as:

- Creating an Alphabet Book, where students demonstrate knowledge of a range of algebraic terms through definitions and illustrations
- Doing a geometry project where students cite and discuss examples of parallelism in the real world
- Writing inequality problems for disjunction, conjunction, and absolute values which are solved by other students and the teacher
- Creating posters which are manifestations of a picture using an appropriate scale factor
- Designing, drawing, or producing an example of a solid formed by revolving an area about a line or an axis.

Each activity has a set of criteria and scoring guidelines. In general, criteria call for accuracy, clarity of image or presentation, originality or creativity, neatness, and understanding of the concept.

While visiting Vicky Reid's tenth grade biology classroom, one could see evidence of a hands-on approach to understanding the DNA molecule. A paper chain made by the students to represent the double-helix construction of the chromosome hung across the blackboard in the front of the classroom. This was referred to as students reviewed for a paper and pencil assessment of their understanding of the complex composition of deoxyribonucleic acid.

However, before the review began, students presented to the class what they had created as a metaphor for DNA. Illustrations of common objects which represent complex systems were used to describe how they were similar to the functioning of the DNA molecule.

Perhaps the most interesting aspect of this learning experience was that it was part of a more comprehensive project planned by a tenth grade interdisciplinary group called Team 2000. The theme, "Who Am I," was connecting Mrs. Reid's Biology classroom to Mrs. Brock's English classroom where the same students were putting together folders with essays and pictures telling about their families. These presentations focused on the past, with a focus on the students' grandparents, and on the present, illustrating their current immediate and extended families. They also wrote an essay about their life today and how they saw themselves in the future in the year 2026.

In addition, Mrs. Reid will do a unit on genetics, and their World Studies teacher, Mrs. Lee, will have them study and explore geographically the backgrounds of their families, and thus their own origins. In Mrs. Macklin's math class they will study tessellations, another example of the mosaic that makes up the individual and groups of individuals.

The team plans an exhibition of its work for parents, faculty, and school board members, which will include the unveiling of a quilt made by the students. All in all, the program represents an intriguing way to integrate various content into a unifying theme to better understand the self as both a physical and social being, and to learn some English, history, math and science while doing so.

For science projects, many of the classes also use a generic rubric that divides student performance into four levels:

### **Distinguished**

- The student completes all important components of the task and communicates ideas clearly.
- The student demonstrates in-depth understanding of the relevant concepts and /or process.
- Where appropriate, the student offers insightful interpretations or extensions (generalizations, applications and analogies).

### **Proficient**

- The student completes most important components of the task and communicates clearly.
- The student demonstrates understanding of major concepts even though she/he overlooks or misunderstands some less important ideas or details.

### **Apprentice**

- The student completes some important components of the task and communicates those clearly.
- The student demonstrates that there are gaps in his/her conceptual understanding.

### **Novice**

- The student shows minimal understanding.
- The student is unable to generate strategy; answers may display only recall effect, lack clear communication and/or be totally incorrect or irrelevant.

This rubric was used in an earth science class where students were allowed to choose from eight options to show their understanding of the deformation of the earth's crust. They could devise a laboratory activity, use modeling clay to represent rock formations subjected to various forces, take photographs of actual rock formations in the area where they live, do a research project about different types of mountains, write a report about the development of the Rocky Mountains, create a picture display from magazines of various land formations, illustrate the formation and rock structure of a folded mountain using clay, or use different colored clay to build a model of a series of synclines and anticlines.

Each student could also choose his or her own project, with approval of the teacher, that would lead to a demonstration and/or report. Students could work alone or with a partner and were to choose a project that was of interest, was feasible without much expense, and could be completed within the time limit.

## **Practice: A Group Experience**

The ninth grade and some of the tenth grade staff is organized into interdisciplinary teams that usually include an English, math, social studies and science teacher. In addition, each team has a teacher assistant-in one case, a college graduate interested in becoming a teacher. The assistant provides team members the support they need in order to have time to plan and teach effectively together. A visit with the S.A.G.E. (Science, Algebra, Geography, and English) team, which was the first team to organize on an experimental basis in 1990, revealed much enthusiasm for creating a family atmosphere for a group of approximately 80 ninth grade students. These team members truly believe in the importance of creating a sense of belonging for their students. They find that even after students move to the higher grades, they still know where the staff team meets and often stop by with concerns or just to say "hi."

The individual attention that is afforded by concentrating on a small group of students, together with the constant communication that occurs among the team members, the students, and their parents, make for a place where students feel someone knows and cares about them.

In addition, the academic program is more coherent and allows for the team to plan activities that engage the whole group. Again, the strategic plan calls for the use of thematic units by all teams. For the S.A.G.E. team, this focus is a special part of their program called Human Connections, which addresses the types of goals thought to be essential for life outside of school. The units address themes in the areas of (1) Life Cycle, (2) Languages, (3) Aesthetics, (4) Time and Space, (5) Groups and Institutions, (6) Producing and Consuming, and (7) Ecology. This year's first assignment had students doing research papers on topics such as changing medical needs from prenatal to old age for the Life Cycle area, and how people have dealt with the natural disaster of flooding throughout the ages. Following this challenging effort for beginning freshman, the staff in this team decided to do something more "active."

A visit to Mrs. Williams's class saw students working in groups of four on a project that would result in each group performing a skit the members had written addressing a situation in one of the seven areas. The morning began with a skit presented to the students, which included the principal, Dr. Beers, as a participant. The group of over 100 students was then told of the assignment to create skits. Students were provided with the criteria on which their storyboards, scripts, and presentations were to be judged. They then had the rest of the morning to work on topics, such as a good and a bad example of a job interview, highlighting proper and improper use of language for the Language area, and illustrating musical taste differences between older

and younger generations for the Aesthetics area.

Each skit was to receive a group grade and individual grades, and be rated by other students and the teacher. The students were to be rated on the following criteria:

1. The team addresses the assigned topic effectively.
2. The team's presentation is informative.
3. All team members are involved in preparation of the skit (evaluated by the teacher).
4. All team members are involved in the presentation.
5. A storyboard is completed and turned in.
6. A script is completed and turned in.
7. The presentation is performed "off script."
8. Contingency plans are made for performing the skit in the event of absence of a team member.

There is also a generic Oral Presentation Assessment Form that is used by the team for all oral presentations. It includes twenty elements, but only those appropriate for the task undertaken are used. For example, the use of graphs and/or charts would not be applicable when doing the skits. A generic set of criteria used for all written products has also been developed and is used by all staff members on the S.A.G.E. team.

## **A Vision**

The staff at York High School is currently working to clarify their intended outcomes for students. The Goals/Standards Committee has presented to the staff for their discussion and approval a set of standards which they feel will continue to foster better learning for all students. They have identified ten broad outcomes, and the performance indicators that they believe will prepare their students for a better future. This and their continued effort to implement and monitor the *Strategic Plan for Restructuring*, can be expected to bring them continued success.

More information about the math and science assessment project and the published report *Alternative Assessments in Math and Science: Moving Toward a Moving Target* is available from Jane Hange, Appalachia Educational Laboratory, PO Box 1348, Charleston, West Virginia 25425, 800/624-9120. You may also contact Vicky Reid at York High School for information about the project.

Dr. Barry Beers is available to provide information about the restructuring efforts at York High School, 9300 George Washington Highway, Yorktown, Virginia 23692, (804) 898-0354.

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