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ABSTRACT

Portfolio assessment is a rather recent concept in the evaluation of student achievement even though the separate items in a portfolio have been used for decades. Students are involved in selecting what goes into the portfolio, and which emphasizes the achievement of objectives from within the classroom. In mathematics education, the portfolio is particularly useful in helping the teacher discuss student achievement with parents. The everyday work of students is stressed in the portfolio assembly and evaluation process. Testing and measurement tend to leave out the results from everyday experiences, but portfolios focus on achievement in the classroom. Teachers, administrators, and parents need to study and analyze different philosophies related to evaluating student achievement, but the portfolio approach is one that has considerable momentum at this time. (Contains 10 references.) (SLD)

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USING PORTFOLIOS TO APPRAISE PROGRESS IN MATHEMATICS

Portfolios are a rather recent concept in evaluation of pupil achievement.

Portfolios have a definite philosophy of emphasis in the evaluating process. And yet, many of the items that go into the portfolio have been emphasized as objectives for some time. Thus, the whole of the portfolio in a folder or with binding is a recent innovation in appraising learner achievement. The separate items in a portfolio such as individual pupils' papers from solving textbook word problems have been with us for at least six decades (1).

Philosophy of Portfolio Development

There is a definite philosophy involved in the development of portfolios as an approach to pupil evaluation. First of all, the following tenets do not pertain to portfolios:

1. Using test scores to appraise learner progress.
2. A one shot procedure of appraisal such as in testing at a specific time. Rather, the contents of a portfolio are continuous in terms of evaluating the progress of pupils.
3. Test item writers, external to the local classroom being involved in ascertaining pupil achievement. Rather, what happens in ongoing learning opportunities provides content for the portfolio (2).

Portfolios then contain items from pupils as different lessons and units are taught. The everyday processes and products of a pupil indicate what the learner has achieved in different curriculum areas. The pupil is heavily involved in selecting what goes into

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his/her portfolio. The teacher is a guide and encourages pupil achievement (3).

Pupils are heavily involved in choosing what goes into the portfolio. The teacher helps the learner to develop quality products and processes for each day of teaching. Thus, he/she also provides guidance in the ongoing portfolio to its completion. Portfolio results reflect the quality of learning that a pupil has shown in classroom performance. A portfolio then is pupil centered in its development. It is also open-ended in terms of the contents to be enclosed as well as the volume. Contents in the portfolio cannot be reduced to a single score, percentile, or standard deviation. The whole is greater than the sum of the parts (4).

Pupil attitude is important in teaching and learning situations. Quality attitudes need to be in evidence in portfolio development since the contents of the portfolio emphasize what has been achieved and what remains to be learned. Diagnosis and remediation come about from ongoing classroom experiences as well as from contents in the portfolio. The portfolio emphasizes the achievement of objectives from within the classroom. Evaluation of achievement also comes from local sources such as teachers, parents, and administrators. Evaluation does not come from outside sources such as writers of standardized and criterion referenced tests (CRTs) (5).

Portfolio results are good to share with responsible people directly involved in the child's progress. Thus, parents of the involved child need to observe and appraise the learner's progress through the portfolio process. Here, the parents may see directly what a pupil is doing in reading, writing, mathematics, social studies, science, art, and physical education. In an integrated mathematics curriculum, all of the above disciplines may be

inherent. What might the teacher and involved pupil discuss with parents pertaining to achievement in mathematics?

1. How well a pupil is achieving knowledge, skills, and attitudinal objectives.
2. How well the pupil is doing for his/her developmental level.
3. How well a pupil is doing in problem solving.
4. How well the pupil is able to think creatively and critically.
5. How well a pupil is improving/maintaining quality attitudes.
6. How well the pupil works individually as well as collaboratively.
7. How well the pupil is achieving in monitoring his/her work by reflecting about previous learnings.
8. How effectively the pupil is growing in metacognition skills to analyze and synthesize personal performance.
9. How well the pupil is sequencing his/her own learning opportunities in portfolio development.
10. How well the pupil is able to convey ideas clearly and consistently (6).

The goals inherent in portfolio development are ongoing and continuous.

Sequence resides within the learner, not in textbooks, nor within the teacher. Holism is involved in thinking when portfolios are developed. The whole is greater than the sum of the parts. Each item in the portfolio contributes toward the whole. General and specific achievement may be noted of the pupil's progress within the portfolio.

Mechanics of Portfolio Development

The portfolio needs to have a title and a table of contents to show organization of

items therein. It is important to reveal pupil progress but not have too many or too few entries. Representative items from each curriculum area in school should be inherent.

Thus, balance in the curriculum is important (7).

What might be the contents for the portfolio in mathematics?

1. Papers of daily work in mathematics as completed in class.
2. Extra credit work completed by the pupil.
3. Snapshots of construction endeavors finished in a lesson or unit of study.
4. Types of discussions, reports, and committee work.
5. Art projects in mathematics.
6. Drawings of mathematics concepts.
7. Written communication in mathematics.
8. Diary entries and logs kept of daily activities and experiences.
9. Journal writing on feelings toward mathematics.
10. Metacognition data on what has been learned and, based on diagnosis, what is left to learn in a lesson or unit of study (8).

Portfolio development and use follows a definite philosophy of education.

Portfolios contain representative samples of every day work of pupils in the classroom and school. Every day work and achievement of pupils is stressed rather than testing once a school year to notice achievement. Pupils are heavily involved in selecting what goes into a portfolio, whereas tests are developed by state departments of education. The test writers, here, are external to teaching/learning situations (9).

Portfolio development also follows a definite psychology of learning. With

strong learner input into his/her portfolio development, he/she sequences in a psychological manner which is reflected upon and chosen for the portfolio.

Psychological sequence involves the pupil sequencing learning opportunities in a developed portfolio. In comparison, a logical sequence is used by test writers when they decide upon the order of content to be presented in testing situations.

Portfolios have much to recommend themselves in that the contents thoroughly accept the every day experiences of pupils for evaluation. Whereas, the testing and measurement movements tend to leave out pupil results from every day experiences, unless these are teacher written tests to measure learner progress in the local classroom (10).

In Conclusion

Philosophy of education involved in developing portfolios include the following:

1. The contents represent the work of the involved pupil.
2. The work consists of pupil achievement throughout an interval of time such as a semester or an entire school year.
3. Representative samples of a pupil's progress is contained in the portfolio.
4. The pupil has developed objectives to achieve and the results of achievement are in the portfolio.
5. The learner developed criteria to use in appraising achievement.
6. The teacher is a guide and assists the pupils to achieve as optimally as possible.
7. Portfolio results may include written work, art products, and snapshots of

constructed items.

8. Cassette tapes involving oral work of the learner.
9. Videotapes of committee and individual endeavors.
10. Criteria developed and used to appraise the contents in the portfolio.

Teachers, administrators, and parents need to study and analyze diverse philosophies pertaining to evaluating pupil achievement. The portfolio concept has quite some momentum at this time.

Somewhat opposite of portfolio use is the testing and measurement movement. Here, the goal is to determine learner achievement through the use of multiple choice test items. Pupil results, from testing and measuring, are a one shot situation, with a numerical figure that indicates where the learner is presently in achievement.

Might the portfolio and testing/measuring both be used to ascertain and report pupil achievement? This issue needs appraising, with attempts made at possibly harmonizing portfolios and measurement/testing procedures.

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