

Australian Journal of Teacher Education

Volume 23
Issue 2 *Vocational Education and Training*
(VET)

Article 4

11-1-1998

Portfolio assessment in vocational education: the assessor's view

Zita M. Wagner
The University of Technology, Sydney

Follow this and additional works at: <https://ro.ecu.edu.au/ajte>



Part of the [Education Commons](#)

Recommended Citation

Wagner, Z. M. (1998). Portfolio assessment in vocational education: the assessor's view. *Australian Journal of Teacher Education*, 23(2).
<http://dx.doi.org/10.14221/ajte.1998v23n2.4>

This Journal Article is posted at Research Online.
<https://ro.ecu.edu.au/ajte/vol23/iss2/4>

PORTFOLIO ASSESSMENT IN VOCATIONAL EDUCATION: THE ASSESSOR'S VIEW

Zita M. Wagner

The University of Technology, Sydney

ABSTRACT

Portfolio assessment has been traditionally used in art, design, music, writing and dance programs. However in recent years the use of portfolio assessment in vocational education has expanded to include many different subject areas such as economics, business, nursing, human resources, mathematics and engineering. As an assessment tool the portfolio has much to offer in terms of involving students in the assessment process and in documenting their achievements. From the assessor's point of view, the use of portfolios for assessment raises issues of reliability, the time consuming nature of assessment, objectivity and authenticity of the work. In this paper twentyfour vocational educators and trainers from a range of teaching areas discuss portfolio assessments from the assessor's point of view. They outline the advantages and disadvantages of assessment by portfolio, how to determine sufficiency of evidence and authenticity of the work and make recommendations for the successful use of portfolios in vocational education including the skills that vocational educators and trainers need to assess portfolios.

INTRODUCTION

Portfolios with their associations of negotiation, reflection and development have become more widely used in vocational education (Bragg, 1995)

and their use has increased in many, different subject areas (Brown, 1997; Stecher, Rahn, Ruby, Alt, Robyn & Ward, 1996). There is a lot of discussion in the literature on the use of student portfolios although much of this discussion centres on the school sector in the USA (Arter & Spandel, 1992; Daro, 1996; Koretz, Stecher, Klein & McCaffrey, 1994; LeMahieu, Gitomer & Eresh, 1995; Supovitz & Brennan, 1997). As an assessment tool the portfolio has much to offer in terms of documenting student achievements and involving students in the assessment process. From the assessor's perspective the assessment method has drawbacks although there is very little in the literature describing this viewpoint. This paper is a critical examination of the portfolio assessment technique using the experience of twenty four vocational educators. They outline the features of the method from an assessor's perspective and make recommendations for its successful use in vocational education.

THE PORTFOLIO

Portfolios are purposeful collections of material over a period of time that can communicate students' interests, abilities and achievements in a certain area. Borthwick (1995) emphasises the need for the portfolio to be more of a selection of work than a collection. There are showcase portfolios where students select their highest quality work and 'works in progress' portfolios which can include

rough drafts, jottings of ideas, data collection, drawings and photos of activity (Shackelford, 1996). There is not usually a requirement in either category of portfolio to reflect extensively on the activities. Portfolios need to be differentiated from reflective journals which incorporate the descriptive notes of a log, the interpretation of a diary and extensive reflection on activity (Holly, 1989). The portfolio has traditionally been used in vocational education in art, design, music, writing and dance programs and in more recent times in business, nursing, welfare and other areas. Portfolio assessment is seen as particularly appropriate to vocational education since it can display products and performances that the workplace requires more than any traditional paper and pencil test (Brown, 1997). While several types of portfolio are used in vocational education, the most common type of portfolio is the showcase portfolio which will be the type of portfolio discussed in this paper.

KEY FEATURES OF PORTFOLIOS IN VOCATIONAL EDUCATION

There appear to be several key features of showcase portfolios in vocational education:

- ∞ they are systematic meaningful collections of student work
- ∞ the student selects the documentation (the evidence)
- ∞ evidence relates to the learning outcomes of the particular subject
- ∞ the evidence is taken from the everyday activities of the student
- ∞ student reflection is required in the evidence selection process

- ∞ portfolios may contain a variety of media.
- ∞ the criteria for judging merit are included (Borthwick, 1995; Herman, Aschbacher, & Winters, 1992; Hoepfl, 1993; Levin, 1996; Paulson, Paulson & Meyer 1991; Shackelford, 1996).

THE PURPOSES AND BENEFITS OF PORTFOLIOS

There are many stated purposes of portfolios and in most cases they are used for a combination of purposes. Portfolios are claimed to integrate theory and practice and learning and assessment, stimulate reflection on practice and promote professional development (Glen & Hight, 1992; Redman, 1994). Portfolios can capture student learning over time and provide a strong foundation for student-teacher discussion and collaboration. Portfolios provide students with a powerful opportunity for self development (Redman, 1994). Students decide what evidence to include in the portfolio, often in collaboration with teachers, peers and employers. They are able to manage and monitor their own learning and own the final assessment product. They can set goals and establish what quality work is in their field (Shackelford, 1996), how to select one piece of work over another and how to provide sufficient work to demonstrate achievement (Borthwick, 1995). The ability to put together a portfolio is an important skill in itself, demonstrating organisation of ideas, structuring material and presenting it effectively.

Using portfolios can provide students with the opportunity to enhance their performance, develop awareness of their skills, see gaps in their learning and determine strategies to further develop (Porter

& Cleland, 1995; Redman, 1994). The showcase portfolio, a collection of high standard work, is 'success focussed' (Brown, 1997, p. 1) and this differentiates it from many other assessment types which are mistake focussed. Portfolios help students document their achievements, enhance their self esteem and develop a more positive attitude to the subject being studied (Gillespie, Ford, Gillespie & Leavelle, 1996).

Portfolios challenge the separation between assessment and curriculum (Glen & Hight, 1992; Paulson et al., 1991). They can more closely integrate learning, assessment and the workplace. The portfolio contents may include work products and samples, projects and academic achievements and work done previously (prior learning). The documentation can include a range of products and processes from the workplace, home or college including computer disks, photographs, videotapes, models and displays. Portfolios are claimed to motivate learning, to encourage students in active learning (Borthwick, 1995; Brown, 1997) and to accommodate different patterns of learning. They may also assist in creating a collaborative climate where there is an opportunity for working with teachers, peers and workplace supervisors (Gillespie et al., 1996).

For the teacher, the portfolio provides evidence that learning outcomes are met, that the work can be done and that training can be evaluated at the learning level. This may be useful to teachers in instructional decision making (Gillespie et al., 1996).

TEACHERS COMMENTS ON PORTFOLIO ASSESSMENT

For this paper the comments on portfolio assessment were collected from twenty four vocational education teachers using open ended written questionnaires and focus groups in April 1998. The teachers were graduates from a wide range of fields such as law, design, nursing, community welfare, business, communications and information technology. They were all engaged in teaching in the TAFE sector, private training colleges or as training and development consultants. Their experience in assessing student portfolios varied from very little through to very experienced. In addition to marking their students' portfolios, they were developing their own portfolios for assessment for an inservice teacher training course and peer assessing each others portfolios at the time they answered the questionnaires. Therefore these teachers were in a position to view portfolio assessment from three perspectives: as an assessor of student work, a peer assessor of colleagues' work and as students themselves preparing a portfolio. In all cases the portfolios were used for summative assessment -to contribute towards a final grade in a subject.

In the written questionnaires and the focus groups the teachers were asked about the time taken to mark portfolios, criteria, consistency of scoring, sufficiency and authenticity of evidence and what effect certain features of portfolios made on them as assessors. The focus group discussions were recorded on audio tape and the transcripts analysed.

TEACHER COMMENTS AND DISCUSSION

Workload

The teachers reported that the time taken to mark an individual portfolio varied from five minutes to one

hour or more with the most common time taken of thirty minutes. Portfolios were rated as 'a fairly time consuming' assessment method for the assessor due to the need to view each portfolio separately with its own specific evidence and then for the assessor to make a judgement. It was difficult for assessors to build up a momentum of marking speed because of the individual nature of each assessment. 'I need to take about twenty to thirty minutes at the initial stage, and then to return and finalise the mark takes about ten to fifteen minutes more'. Portfolios were viewed as equal to projects and other individual work as far as marking time required, taking more time than most set written tests but less time than, for example, panel viva voce assessments. Teachers indicated that much can be done to make marking quicker by using marking guides and by assisting students to structure the portfolio.

According to Jasper (1994) the marking, of portfolios can be time consuming and arduous and can add to teachers' workloads. This may be the greatest weakness of portfolio assessment (Moss, Beck, Ebbs, Matson, Murchmore, Steele, Taylor & Herter 1992; Wolf, LeMahieu & Eresh, 1992) even if procedures can be streamlined. Assuming a reading rate of one page per minute a twenty five page portfolio will take about thirty minutes to read and to score the marking guide (Reckase, 1995).

Sufficiency of Evidence

Teachers indicated that they felt confident in assessing sufficiency of evidence. They reported that they looked for a range of examples of work in each category. In some cases one example was sufficient and in others multiple examples were needed to provide evidence that the students met the

learning outcome. Teachers noted that in traditional assessments students are normally required to hand in one example of work (rarely more) and that it was overly harsh to insist on a large range of work in a portfolio. 'You can't ask them to do more work in a portfolio than in traditional assessment'. One or two quality pieces of work was thought to be sufficient.

Authenticity of Evidence

Teachers reported fewer problems with portfolio assessments regarding authenticity of work and cheating than with other commonly used assessments. They felt that this was due in part to the individual and developmental nature of the portfolio leading to less scope for cheating. Other practices, such as having meetings with students throughout the semester to view their work, working with small classes and having an interview after portfolio submission meant that teachers could become familiar with students' work and prevent cheating. 'I view works in progress regularly'. Some teachers reported routinely checking fonts and handwriting and cross checking evidence as they marked portfolios to confirm authenticity of work. Another measure used was getting students to sign a form or statutory declaration claiming that all the portfolio was their own original work or getting workplace supervisors to verify the authenticity of work. This however did not rule out the possibility of collusion with supervisors. Some large portfolio marking schemes report using random audits to monitor authenticity of work. According to Waugh and Godfrey (1994), the scope for cheating has widened considerably in recent years. Students have more

opportunities for collusion among themselves, copying work from previous years and obtaining assistance from relatives and friends. While they may be certain forms of assessment such as portfolios where the scope for cheating is not as wide as other forms of assessment, it is still important to institute certain practices that will discourage cheating, if not prevent it entirely.

Marking Guides

All teachers recommended the use of marking guides with written criteria for portfolios. These can be developed for the whole class by the teacher or individually by the student to match the learning outcomes. Two types of guides appeared to be in use: holistic marking guides which give guidelines, and checklists of criteria. Holistic guides encouraged the teachers to assess 'globally' but did not offer much assistance to the novice assessor. Checklists were easier to use but made teachers operate too atomistically with the assessment. Teachers felt that marking guides helped them to achieve consistency for themselves and also across assessors. Marking guides also assisted them to keep on track and to remember to look for certain types of evidence. Teachers added that there was

still the need to operate flexibly and assess various kinds of evidence that may be unexpected. It was also felt by the teachers that marking guides greatly speeded up the assessment process.

Consistency

To improve consistency of scoring teachers recommended discussion and agreement by both students and assessors on the criteria and marking guides. To further enhance consistency they

indicated that assessors should view samples of portfolios while going through marking guides and that they meet regularly with other assessors. The development of exemplars was also recommended to assist assessors in determining standards of work. 'It's good to see samples of portfolios and discuss with other assessors what's good and bad about them'. One of the main issues relating to portfolio assessment is reliability, particularly inter-rater reliability - the consistency with which different raters (assessors) assign scores to portfolios (Brown, 1997; Gillespie et al., 1996). It is doubtful that estimates of student performances are stable across independent collections of student work (LeMahieu et al., 1995) due to the variability in the student work and the idiosyncratic selection of portfolio tasks by students. Overall it is unlikely that high standards of reliability can be attained from portfolio assessment in the vocational classroom or workplace (Stecher et al., 1996).

Portfolio Layout and Presentation

Teachers reported that they were affected by the structure and presentation of the material in the portfolio. They regarded it as essential that students structure the portfolio properly and display organisation of material in an easy to follow order. The inclusion of a table of contents, cross referencing, pagination and the use of signposting tags and markers were specifically noted as being helpful to the assessor. Commentary on the evidence, particularly where it is of a works in progress nature was thought to be important. According to Hannam (1995) caption statements convert the documents in a portfolio into evidence. The layout and format of the portfolio was also

mentioned as of high importance: that it should be neat, easy to read, clear and generally well presented. It was highlighted by teachers that there was a portfolio 'technique' that was as important for students to acquire as other assessment techniques such as essay or report writing. To this end students sometimes were offered the support of a student study unit in portfolio preparation to assist them in acquiring this technique.

Conversely a portfolio which was untidy, poorly presented with poor structure and layout affected the assessors adversely. Teachers reported the difficulty of hunting, and searching for evidence hidden in a mass of detail, lacking signposting. Large portfolios were particularly suspected of containing 'bulk filling'. 'Big is not beautiful'. Repetition, multiple spelling or typographical errors, many photocopied documents and irrelevant inclusions such as first aid certificates for a business subject, were also cited as making a poor impression on assessors. 'I'm particularly dismayed when I see references from former school teachers and scoutmasters saying what a great person they (sic) are'. In addition, material that needed special handling or extra time such as plastic sleeves or documents that needed to be taken out or untangled were cited for special mention in this category. When faced with these problems assessors felt that they had to adhere very closely to their marking guides and not be distracted by the undesirable features. Redman (1994) advises assessors to put limitations on what goes in to student portfolios otherwise they become too unwieldy. Teachers emphasised that a portfolio needs to 'stand alone' whether marked by a regular classroom teacher or an independent assessor (which is rare in vocational

education). The portfolio needs to be sufficiently well structured and easy to follow for the assessor to move through it without the assistance of the student.

Assessor Skills

Teachers emphasised the need to be up to date in their subject area when assessing portfolios. They had to know their field and the breadth of activities of people in their area in order to judge the range of evidence. 'You need to know your field, know how portfolios work and be able to operate in a variety of contexts'. They had to keep themselves informed of competency standards, learning outcomes or other benchmarks. It was emphasised that portfolio assessment is not the place for a novice assessor to start and that expert judgement was often required. Sometimes inferences needed to be made from the material. Direct evidence may not be provided on a certain learning outcome but certain inferences had to be made from other evidence provided. Teachers also emphasised that portfolio assessors need to be able to read quickly, to focus on important points and not to be distracted too easily, yet to be thorough and pay attention to detail. Assessors need to be able to concentrate intensely and follow the job through until the end. Also noted was the need to be able to determine cut off points to decide whether there was sufficient evidence of high quality or not and to make a judgement. In the developmental phase of the portfolio teachers reported the need to be good communicators, patient, flexible, open to negotiation, assertive and able to work in varying contexts. They specifically mentioned the need for mentoring, coaching and facilitation skills - to assist students to arrive at their

own conclusions and to point out directly and unambiguously where they need to present more evidence. Teachers also emphasised that they needed to be familiar with the range of assessment options and the various advantages and disadvantages of each. Specifically they cited having a good working knowledge of portfolios, the rationale for their use and their potential for learning.

EVALUATION OF THE PORTFOLIO METHOD

The Learning Function

The major contribution of the portfolio seems to be in the area of self development. Portfolios emphasise student responsibility through selection of material and self assessment. Portfolio development appears to facilitate clarification of ideas, linking, planning, reflection and critical thinking (Arter & Spandel, 1992). Another advantage of portfolio assessment is its support for integrated learning. The portfolio can also provide teachers with feedback on individual student's progress with their projects and highlight areas where difficulties are arising. This information can then be used to tailor strategies to individual student's needs (Shackelford, 1996). On a broader scale the teachers and course coordinators can look at the portfolios to gain insight into the learning processes of their students and may be able to ascertain whether more general course outcomes are being met (Gillespie et al., 1996). Another advantage of the portfolio as an instructional activity is its orientation to workplace practice as students are encouraged to collect evidence from their workplace. The portfolio requires teacher/

student planning and monitoring of progress and therefore fosters collaboration. There is also the opportunity for the teacher to take on a coach/mentor role in assessing progress, assisting with problems, providing information on accessing resources and improving documentation of the process (Shackelford, 1996).

The Assessment Function

Research indicates that students focus on assessable activities and rate activities which are assessed, as important (Elton & Laurillard, 1979). Every assessment activity gives a message to students about what is important and what they should be learning. The integration of learning and assessment and the emphasis on the student selection of evidence gives a powerful message to students about the focus for learning and the responsibility for learning in portfolio assessment. Portfolio assessment also allows teachers to view student achievement in 'a longitudinal and holistic perspective' (Slater, Ryan & Samson, 1997, p.270). The primary validity question for portfolios is regarding the construct represented by the student products and clear definitions need to be developed regarding these constructs or domains the assessment is designed to tap. Validation requires clear statement of the inferences that the assessment is designed to support and these need to be made available and explicit. The questions need to be asked: Does the task actually measure what it sets out to measure? How well do portfolio pieces (the evidence) match important learning outcomes? If the choice of student work for inclusion reflects a range of activities over the subject's duration the content validity will be high. In addition, teachers

need to consider that the best pieces of work in showcase portfolios may not represent typical performance sustainable under normal conditions (S Lecher et al., 1996). The teacher needs to consider whether 'best work' is a real measure of a student's performance although this is a question rarely considered for other types of assessment.

Concerning reliability, the inter-rater reliability, the consistency with which raters (assessors) assign marks to a particular piece of work, appears to be low (Koretz et al., 1994) due to variability across groups, conditions under which work is done, lack of agreement among teachers and unclear criteria. This may not be a problem, however, if assessment results are only used to ascertain whether students reach subject outcomes and the information is not required to compare cohorts of students or courses across intakes or institutions.

Due into the individual and developmental nature of the portfolio there appears to be less scope for cheating than in 'traditional' assessments. Teachers reported fewer problems with portfolio assessments regarding authenticity of work and cheating than other commonly used assessments. However in view of the perception of both students and teachers of the increase in cheating it is important to put into practice certain procedures that will discourage cheating. These include specifying what cheating is, a description of the consequences and changing the requirements of the portfolio from year to year. From this study and from others (Brown, 1997; Wolf et al., 1992) the greatest weakness of portfolio assessment appears to be the increased workload for the teacher although clear criteria, marking guides and good portfolio structure and layout may speed

up the scoring, process. In order to decrease the assessment workload teachers may have to restructure the assessment roles of teachers and students.

Another weakness of the portfolio method is the need to have expert scorers - assessors with experience in using the assessment method and with specialist knowledge and feel for their subject area.

Recommendations

The following recommendations will help staff and students to prepare for portfolio assessment, assist them during the activity and build on the documentation and recording of the evidence.

Choice of the Portfolio Method

The choice of a portfolio as an appropriate assessment method needs to be related to the subject, its content and outcomes and student characteristics. The question needs to be asked: 'Can the student collect a range of evidence for these learning outcomes?' The portfolio may also be a suitable assessment method for subjects with associated aims of organising, selecting and analysing material and in self assessment. The rationale for choice of assessment method and its purpose needs to be clear to students and teachers since for many it may be an unfamiliar method. The learning outcomes that the portfolio relates to need to be made explicit and the criteria for assessment developed by the students, students and teacher or by the teacher and discussed.

Process

Since this may be an unfamiliar method to both students and staff, teachers need to spend time flagging it to students and provide exemplars.

Students need to spend time practising, preparing drafts and submitting works in progress as this may well be a new assessment role for them choosing, negotiating and developing evidence for the portfolio. Like any new assessment method, students need early feedback on their progress and opportunities for reworking. Teachers need to emphasise that this is a developmental, consultative process and build in consultative steps and a series of due dates to avoid having portfolios arriving on the desk of the assessor as one large piece of unfamiliar work. As part of this consultative process, steps of self assessment and peer or workplace supervisor assessment may be built in. As with all assessment, it needs to be emphasised that the learning is a continuous process and it does not stop with the completion of a portfolio.

Students, over a semester, can take on increasing responsibility for their own learning and for documenting their achievements. This may ensure that portfolio assessment is not an 'add on' for the teacher but an opportunity to restructure their routines and the time spent in assessment and learning. Regular meetings between teachers and students during the semester, where the student uses the portfolio material as a basis for discussion, may give the teacher more information on the process and its effectiveness rather than receiving a large quantity of unfamiliar material infrequently. During the meetings the teacher can take the opportunity to become familiar with the standard of the portfolio and make the assessment as the semester progresses (Jasper, 1994).

Teacher Training

Also of importance is the need to provide staff development training to equip teachers to conduct effective portfolio assessments and to assist them to have a good grasp of the portfolio approach, its potential for learning and how to put it into practice. Teachers may also need to develop more skills in mentoring, coaching, facilitating and negotiating learning - to assist students to arrive at their own conclusions. Redman (1994) recommends that preservice or inservice teacher training should provide an opportunity for teachers to develop their own portfolios and to increase their familiarity with the method.

Portfolio assessment is seen as particularly appropriate to vocational education since it can display products and performances that the workplace requires more than any traditional paper and pencil test (Brown, 1997). It can also provide students with an opportunity to organise their learning and achievements in their own meaningful terms. However, teachers from all fields report variability in attitude to using portfolios and their success with the technique. It is by no means a 'one size fits all' assessment technique. To a large degree the success of the portfolio method is contingent on consistent monitoring, of student progress (Hannam, 1995). To be successful the portfolio activity also needs to have a clear purpose, tie in with program goals and have a specific plan for assessment (Arter & Spandel, 1992). Unless portfolio assessments are acceptable to assessors and students alike, specifically addressing the problems of unfamiliarity for the students and workload for the teachers, and are used appropriately they will fall into disuse (Glen & Hight, 1992).

REFERENCES

- Arter, J.A. & Spandel, V. (1992). Using portfolios of student work in instruction and assessment, *Educational Measurement: Issues and Practice*, 11 (1), 36-44.
- Borthwick, A. (1995). Body of evidence, *Vocational Education Journal*, 70 (3), 24-26, 48.
- Bragg, D.D. (1995). Assessing postsecondary vocational -technical outcomes: What are the alternatives? *Journal of Vocational Education Research*, 20 (4), 15-39.
- Brown, B.L. (1997). *Portfolio assessment: Missing link in student evaluation*. ERIC Alert, Columbus Ohio: ERIC Clearinghouse on Adult, Career and Vocational Education.
- Daro, P. (1996). 'Standards and portfolio assessment', in J. B. Baron & D. P. Wolf (eds.) *Performance -Based Student Assessment: Challenges and Possibilities*, Ninety-fifth Yearbook of the National Society for the Study of Education Part 1. Chicago, Illinois: University of Chicago Press.
- Elton, L. & Laurillard, D.M. (1979). Trends in research in student learning, *Studies in Higher Education*, 4 (1), 87-102.
- Gillespie, C.S., Ford, K.L., Gillespie, R.D. & Leavell, A.G. (1996). Portfolio assessment: Some questions, some answers, some recommendations, *Journal of Adolescent and Adult Literacy*, 39 (6), 480-491.
- Glen, S. & Hight, N.F. (1992). Portfolios: An affective' assessment strategy? *Nurse Education Today* 12, 416-423.
- Hannam, S.E. (1995). Portfolios: An alternative method of student and program assessment, *Journal of Athletic Training*, 30 (4), 338-342.
- Herman, J.L., Aschbacher, P.R. & Winters, L. (1992). *A Practical Guide to Alternative Assessment*. Alexandria VA: Association for Supervision and Curriculum Development.
- Hoepfl, M.C. (1993). Portfolio assessment, *The Technology Teacher* 53 (2), 28-29.
- Holly, M. L. (1989). *Writing to Grow: Keeping a Personal-Professional Journal*. Portsmouth, NH: Heinemann.
- Jasper, M. (1994). 'The use of a portfolio in assessing professional education', in G. Gibbs (ed.) *Improving Student Learning Through Assessment and Evaluation*. Oxford: The Oxford Centre for Staff Development.
- Koretz, D. Stecher, B., Klein, S. & McCaffrey, D. (1994). The Vermont portfolio assessment program: Findings and implications, *Educational Measurement: Issues and Practice*, 13 (3), 5-16.
- LeMahieu, P.G., Gitomer, D.H. & Eresh, J.T. (1995). Portfolios in large-scale assessment: Difficult but not impossible, *Educational Measurement: Issues and Practice*, 14 (3), 11-28.
- Levin, B.B. (1996). Using portfolios to fulfil ISTE/NCAIE technology requirements for preservice teacher candidates, *Journal of Computing in Teacher Education*, 12 (3), 13-20,
- Moss, P.A., Beek, J.S., Ebbs, C., Matson, B., Murchmore, J., Steele, D., Taylor, C. & Herter, R. (1992). Portfolios, accountability and an interpretive approach to validity, *Educational Measurement.- Issues and Practice*, 11 (3), 12-2

Paulson, F.L., Paulson, P.R. & Meyer, C.A. (1991). What makes a portfolio a portfolio? *Educational Leadership*, 48 (5), 60-63.

Porter, C. & Cleland, J. (1995). *The Portfolio as a Learning Strategy*. Portsmouth, New Hampshire: Boynton/Cook Publishers.

Reckase, M.D. (1995). Portfolio assessment: A theoretical estimate of score reliability, *Educational Measurement: Issues and Practice*, 14 (1), 12-14, 31.

Redman, W. (1994). *Portfolios for Development. A Guide for Trainers and Managers*, London: Kogan Page.

Shackleford, R. (1996). Student portfolios: A process/product learning and assessment strategy, *The Technology, Teacher* May/June, 31-36.

Slater, T.F., Ryan, J.M. & Samson, S.L. (1997). Impact and dynamics of portfolio assessment and traditional assessment in a college physics course, *Journal of Research in Science Teaching*, 34 (3), 255-271.

Stecher, B.M., Rahn, M.L., Ruby, A., Alt, M.N., Robyn, A. & Ward, B. (1996). *Alternative Assessments in Vocational Education*. Santa Monica, CA: Rand Corporation.

Supovitz, J.A. & Brennan, R. T. (1997). Mirror, mirror on the wall, which is the fairest test of all? An examination of the equitability of portfolio assessment relative to standardized tests, *Harvard Educational Review*, 67 (3), 472-502.

Waugh, R.F. & Godfrey, J.R. (1994). Measuring students' perceptions about cheating, *Education Research and Perspectives*, 21 (2), 28-36.

Wolf, D.P., LeMahieu, P.G. & Eresh, J. (1992). Good measure: Assessment as a tool for educational reform, *Educational Leadership*, 49 (8), 8-13.