

Portfolios as developmental assessment tools

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Portfolios can be valuable tools for development and are in this respect informative evaluation devices for gaining understanding about individual accomplishments. The portfolio's strongest benefit is probably the insight it provides into performance as well as the way it helps track progress in learning. This study investigates how the portfolio's attribute to proliferate can show acquired competence in a concrete, visible and tangible way. Differences between three types of portfolio were studied. These are the reflective portfolio, the dossier, and the course learning portfolio. It was hypothesised that a developmental use of portfolio would support the portfolio collector best through the functional feedback it provides. The results of the study indicate that the reflective portfolio is an especially effective assessment tool for bringing about performance and learning-related change. The reflective portfolio is particularly suitable for focusing directly on self-determined levels of performance as well as showing recommendations from feedback provided by the portfolio instrument.

Introduction

Assessment is increasingly being recognised as a valuable tool for improving performance, as well as for appraising, it. This has been shown to be true especially with regard to professional learning (Heartel, 1990; Redman, 1994). Portfolios as one of the more prominent instruments (Smith and Tillema, 1998) can be used as learning tools for competence development because they provide opportunities to monitor and appraise changes in performance. Assessment by means of portfolios (Peterson, 1995; Smith, 1998) is obtained by compiling evidence about performance and relevant feedback about individual practices. A developmental approach to portfolio construction

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may reveal possibilities and opportunities for learning in different (i.e., changing) contexts (Fisher and King, 1995).

Portfolios as tools to document and assess work-related performance (Bennett and Ward, 1993) can be variously structured, thereby enabling the learner to gain insights into performance in different ways. Reviewing the impact of the various portfolios may reveal which approach to portfolios seems best suited to deal effectively with professional learning because such instruments can provide the (feedback) information necessary for work settings. From the literature on portfolios (Wade and Yarbrough, 1996; Smith and Tillema, 1998), three types can be identified: the performance dossier-type portfolio, the reflective learning portfolio and the course-related learning portfolio (also Winsor, Butt and Reeves, 1999).

Performance dossier portfolios (Graves and Sunstein, 1992) are often advocated as tools for documenting work performance in relation to external evaluation requirements (Swanson, Norman and Linn, 1995; Wiggins, 1993; Delandshere and Petrovsky, 1998). Using this type of instrument for assessment focuses on marked achievements that may be appraised and evaluated judgmentally according to specified external standards. Collection of prototypical performance evidence in fixed formats is probably the key feature in identifying this type of portfolio (Herman and Winters, 1994; Peterson, 1995). Together with related instruments such as work samples (Wood, 1994), dossier-type portfolios have gained widespread popularity as tools for achievement evaluation and standardised testing of performance (Bennet and Ward, 1993); they are primarily used to appraise attainment of critical behaviour and/or programme admission.

Portfolios of course-related learning (i.e., for informing individuals about redirecting and regulating their programme-related competence development) place high value on the recognition, interpretation and utilisation of relevant learning experiences according to the programme or course standards for required performance. Collecting targeted, often pre-specified, knowledge in portfolios enables meaningful appraisal or decision-making (by tutor and learner) on the (alternative) routes to be taken for further development (Herriot, 1989; Winsor *et al.*, 1999). Course-related learning portfolios are primarily used to frame an evaluative process for determining development of competencies.

A reflective learning portfolio documents and illuminates the cyclical process of professional growth in understanding work experiences (Smith, 1998), often through continuous monitoring over an extended period of time. This highly authored process of collecting personal data closely resembles a biography (LaBoskey, 1997; Hamilton, 1998). The portfolio is used as a document in and alongside professional practice for integrating evolving thoughts and actions and is directed by personal goals and learning needs.

Despite these differences, important advantages in the compilation of all three portfolios lie in their ability to identify strengths and weaknesses in performance (Redman, 1994; Smith and Tillema, 1998), to develop awareness of competence (Topping, 1998) and to resolve discrepancies between (external) standards and achieved performance (Delandshere and Petrovsky, 1998; Winsor *et al.*, 1999). The most important feature is probably the way portfolios capture achievements under realistic circumstances and record them using authentic evidence and tangible products.

The portfolio as a tool organises the evidence collection process (Olson, 1991). Utilisation of this information is the crucial part of the process: the portfolio collection needs to be appraised, scrutinised and arranged to be of use for future action or development. In this respect, what needs to be examined is the relevance the collected information has as a learning opportunity, which is probably greatly influenced by the type of portfolio used (LaBoskey, 1997; Hamilton, 1998), i.e., the dossier portfolio uses the collected information primarily to convey knowledge of results; the course-related learning portfolio seeks out functional feedback in relation to goals to be attained; and the reflective portfolio focuses specifically on process feedback and self-evaluation (Boud, 1995). Therefore, the way the information is framed in the portfolio

(i.e., as highly structured entries in a standard model or in a very individualised form) determines to a great extent the use that can be made of the information for further learning and development. This can be explained as follows: acceptance and use of the collected information will be attributed largely to the perceived outcomes they offer to the recipient (Topping, 1998). Thus, the way in which collected information is accepted and utilised has to account for (a) the recipient's thinking and beliefs, thus revealing his or her sense of competence; (b) a proactive use of feedback for development; and even (c) enhanced future performance. These criteria offer a background for the evaluation of portfolios as interventions for learning.

Learning for development

A developmental use of portfolios, i.e., as constructive intervention tools (Boud, 1995; Collins, 1996; Smith and Tillema, 1998), stresses active exploration and deliberate compilation, as well as purposeful collection of performance-related information by the learner. During the compilation of evidence, the portfolio as a tool offers a framework to monitor and coach performance improvement, often with the aid of mentors or coaches who provide feedback on the portfolio evidence. This kind of deployment of the portfolio instrument makes it especially suitable as a 'tool for learning' (Tillema, 1998).

A developmentally oriented portfolio, however, also requires a responsive design with sufficient freedom for the learner to add individual (learning) elements and to make personal choices in the collection of evidence. In the developmental approach, the portfolio is intended to provide the greatest benefit by providing feedback to the learner about attained levels of competence in relation to aspired levels. Furthermore, the aim is to enable the learner to be in control of the collection process, receiving feedback to accomplish professional targets/learning goals (Boud, 1995). This calls for a deliberate and knowledgeable use of the portfolio evidence aimed at delivering functional feedback (Butler and Winne, 1995).

However, as several studies have shown (Peterson, 1995; Wade and Yarbrough, 1996), use of the portfolio instrument can be limited to a collection of mandated evidence of performance in which the person is not necessarily involved; it can also be a registration of past accomplishments or prior learning. Such collection of performance information is often closely related to certification or selection; for instance, for appraising qualifications and as such, would not necessarily be part of a learning or developmental orientation. It is hypothesised here that a developmental use of the portfolio, i.e., in a reflective or (course-)learning oriented way, will benefit the portfolio collector most, since it provides focused and functional feedback on the learning progress of the compiler of the portfolio. The issue in choosing the type of portfolio or the conditions under which portfolios are compiled is: are professionals receiving the kind of feedback about their performance that is conducive to improving their thinking, learning and performance? A study was undertaken to investigate how professionals just embarking on their careers used specifically designed portfolios provided to them for their further learning and performance improvement. The investigation centred on how the portfolio influenced acceptance and use of feedback for performance improvement and changed the insights about performance. For this reason three types of portfolio collection were compared: the dossier, the reflective and the course learning portfolio.

Method

Setting and sample

The data in this study were gathered in the context of a training programme for small business and retail managers just embarking on their careers, and was offered by a large institution of higher education in the Netherlands. The programme was

set up as a competency-based curriculum focusing on entrepreneurial learning and practice-based teaching. The managers established their own mini-companies from the start of the programme; they were engaged as independent learners responsible for directing their own learning and success. Since most of the teaching and learning took place outside the institute, the teaching staff served more as counsellors, mentors, assessors and programme designers than as instructors.

Three separate samples, each using different portfolio types were employed in this study. A total of 137 students enrolled in the cohort programme for three successive years: starting in 1996 (with a total of 19 students) and continuing in 1997 (with a total of 34 students) and 1998 (with a total of 84 students).

Instruments

In the study, portfolios were used to collect data on progress in entrepreneurial competencies as stipulated by the programme. In each of the three cohort staff teams, the portfolio assessment tool was designed differently, according to staff decisions about monitoring student progress. From the outset, it was decided that each portfolio would include various core elements, which could be complemented or modified according to the choices in each cohort team. They included:

- index of entries: list of what is included in the portfolio with regard to intended learning outcomes;
- description of each portfolio entry: background information about what was accomplished in practice to provide the framework for the evidence collected;
- evidence: the core of the portfolio, which consisted of several materials demonstrating behavioural outcomes, e.g., an analysis of a ledger, critical incidents in personnel counselling, timetables, notes from project meetings, client evaluations or other suitable materials.

This core portfolio design was modified in the successive cohort years depending upon assessment deliberations. This gave rise to three different types of portfolios.

1. Dossier portfolio: a portfolio guideline that specified precisely what products of work-related performance were to be included as evidence of accomplishments in the work environment. The portfolio was defined as a vehicle to collect the practice materials to be evaluated as evidence and consisted of the above core elements only.
2. Course-related learning portfolio: this portfolio was defined as a detailed description of targets to be attained in the training programme, as well as the collection of evidence about attained performance in practice settings. The course-learning portfolio was intended to highlight specific learning goals and also included the following steps as core elements (see above):
 - (a) Defining competencies to be attained—for which the student was held responsible. A contract expresses the individual's responsibility for achieving certain standards.
 - (b) Self-assessment: discrepancies between an individual's own perceptions about competence levels and external standards set by the programme. These were collected through self-assessments.
3. Reflective learning portfolio: the reflective portfolio was defined as a learner report on professional growth in competence. It contained records of achievements in professional practice developed over time. The inclusion of particular records is explained by the student in the portfolio.

The reflective portfolio added the following elements to the core portfolio:

1. Focus and scope: each portfolio had an optional and a compulsory section. In the optional section, a deliberate choice is made about the professionally relevant targets to pursue. In the compulsory section, the various learning goals that needed to be worked on in greater depth were stipulated.

2. Reflections: each entry concludes with personal comments expressing self-examination and evaluation of learning efforts. As a means of monitoring and criticising individual work, each learner was instructed to examine the specific learning, efforts and achievements.

In feedback sessions for each cohort, after the portfolio collection period individuals presented their portfolios to their mentors; the nature of feedback received differed depending on the type of portfolio.

Measures

A questionnaire was developed to gauge the portfolio users' rating of perceived benefits and problems while collecting and learning from the portfolio. Three criteria were used to measure the portfolio collection process:

1. The degree to which the portfolio delivered insights into performance—a criterion especially important from a developmental or learning perspective. It included support experienced, insights gained, and use of information (see Table 1).
2. The amount of support and framework the portfolio gives to (further) performance improvement—a criterion especially important from a certification and qualification orientation for portfolio use. It included both the growth and performance gains experienced.
3. The degree of acceptance of feedback by the portfolio user—a criterion especially relevant to the intervention potential of portfolios. It included acceptance of feedback and the recommendations followed.

Also, overall performance ratings of the portfolio collector were obtained from supervisors in the work and training settings. These were necessary to establish achieved competence levels for each portfolio collector (i.e., through practical assignment ratings and course ratings). Data collection took place at the end of the first year of portfolio compilation. These criterion data were scaled on a 5-point scale to accord with the other criteria. Evaluations were collected by asking the participants to fill in the questionnaire during the last feedback session.

Results

The first point to be investigated was whether there were any differences among the three portfolio types on the criterion measures. Table 1 presents the F test statistics for the consecutive items. As Table 1 indicates, differences between the portfolio types were found on a number of items. Further analysis was required to investigate the extent to which the choice of a particular type of portfolio renders a given benefit or advantage, i.e., does a certain type of utilisation coincide with a tendency toward certain outcomes in the portfolio? Three kinds of outcomes associated with the type of portfolio were identified. These were portfolios: (a) offering a 'showcase' or opportunity to present achievements and evidence of performance in a clear and orderly way; (b) including evidence of accomplishments and an overview of past performances or attained targets; and (c) providing personal feedback and opportunity for reflection on progress being made in individual competence development.

Table 2 shows there is clearly a correspondence between the portfolio instrument and its perceived benefits. Table 2 presents the regression weights that delineate the direct impact of each instrument on the utilisation criterion. Table 2 shows the strongest weights for each type of portfolio, and which corresponds best to each purpose or intended use:

- the dossier type is strongest in its ability to show required or mandated outcomes and to give an overview of performance on specified targets;
- the course-learning portfolio is especially appropriate in showing individual

Table 1: Testing for differences between types of portfolio on criterion measures

	F	Sig
Impact rating by mentors		
1. Rating practice work	6.77	.00
2. Rating course results	3.87	.02
Rating by respondents on		
Delivery of insights		
3. Experienced personal support	.58	.56
4. Provision of insight	8.08	.00
5. Information provided by others	3.98	.02
Acceptance and use of feedback		
6. Acceptance of feedback	1.21	.31
7. Following recommendations	.85	.43
Performance improvement		
8. Effects on learning and growth	3.11	.05
9. Effects on performance	2.48	.09

Table 2: Perceived benefits of utilising different types of portfolio (regression weights found)

	Presentation showcase	Overview of performance	Insight into developmental progress
Dossier	.24	.12	-.07
Course-learning portfolio	.06	.36	-.09
Reflective portfolio	.02	-.01	.29

accomplishments for a given period, revealing what has been accomplished and worked on;

- the reflective portfolio is most appreciated for its insights in development and progress in learning, which aligns with the purpose of this instrument.

Furthermore, Table 2 indicates that there is hardly any benefit experienced that falls outside the intended purposes or scope of particular instrument; i.e., the type of portfolio largely determines what is actually collected and regarded as appropriate. One explanation for this is that the particular directions within a given type of portfolio (i.e., by mentors or those who demand a portfolio) determine to large extent what will be the purpose of the instrument in the eyes of its compilers. Apparently, there is an adaptation to expectations to the context (i.e., the instrument); this requires careful consideration.

Further results from this study may provide a more balanced perspective regarding these first findings. Thus, we then examined to what degree the respondents aligned their own perceptions of competence (self-assessment) with their mentors' evaluations of competence derived from the portfolio (Figure 1). This is revealing because in a self-directed learning environment, the portfolio can be used as a tool for independent learning. Each learner has a high involvement in interpreting and valuing the appraisal information for directing further development and learning needs. Figure 1 indicates which type of portfolio provides better insights into performance and which is more appropriate for revealing competence levels. In the dossier and course-

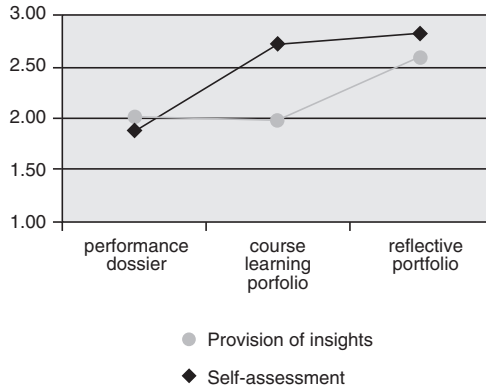


Figure 1: Relation between self-assessment and insights gained for different types of portfolio

related portfolios the insights are less significant than in the reflective portfolio. Interestingly, the course-related portfolio shows a discrepancy between self-assessment and evaluation of the outcome from the portfolio. The reflective portfolio shows a direct correlation between self-assessment and assessment outcome from the portfolio. This portfolio seems best for providing insights into performance, which may be attributed to the active and deliberate way the data was collected, delivering a more realistic picture of accomplishments. The course-related learning portfolio, on the other hand, suggests a poor fit between self-perception and the information collected in the portfolio. This may have negative consequences, interfering with acceptance of feedback and the mentor's delineation of learning needs (see Jones and Whitmore, 1995).

An investigation into the correspondence between insights about performance (through the portfolio) and the acceptance and use of feedback recommendations (depending on the type of portfolio) was also made (Figure 2). Based on the findings presented in Figure 1, a direct correlation was observed between self-direction and involvement (i.e., the findings in a reflective use of the portfolio) and acceptance of the evaluations from the portfolio.

Figure 2 shows the relation between provision of insights (by the portfolio instrument) and the degree of acceptance of feedback. The greatest difference is found between the dossier and reflective portfolios, the latter showing clearly the highest acceptance of feedback, coinciding with the highest level of insights provided. From this it may be concluded that acceptance of feedback and provision of insights are directly correlated with the type of portfolio.

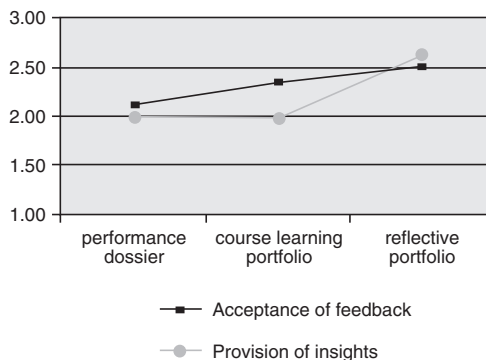


Figure 2: Use of feedback information for different portfolios

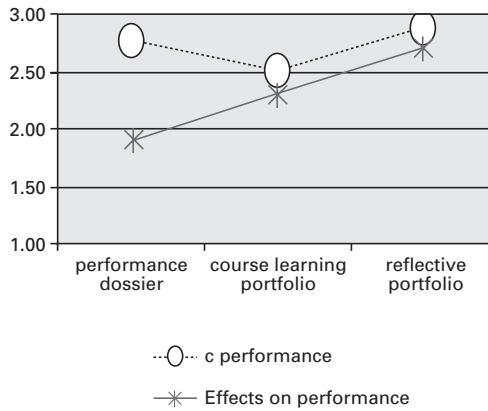


Figure 3: Relation between feedback delivery and performance improvement

The course-learning portfolio falls in the middle as far as acceptance of feedback is concerned; however, it does not show a corresponding increase in insights provided. This outcome suggests it is less well suited to further learning and development. It is also weaker in its prospect of following recommendations for further learning. Thus, acceptance of feedback may well require provision of feedback information related to learner insights.

But in the appraisal of performance the learning or developmental process is (or should be) less important than the outcome. Are the dossier and course-related learning portfolios especially important because they are performance-oriented? It was, therefore, necessary to observe if there was any relation between the nature of feedback given through these type of portfolios and the apparent improvement in behaviour or performance presented in Figure 3.

As Figure 3 indicates, there is a clear difference in performance change among portfolio types: the reflective portfolio shows the most gains, which correlates with its highest functional feedback (i.e., perceived support from the portfolio). The dossier shows the lowest levels of behavioural improvement, but high levels of appraisal. Perhaps an experience of confrontation was perceived when feedback was received about accomplishments. The course-related portfolio, which shows the least behavioural and functional feedback (see Figure 1), indicates that a strong focus on performance in this type of portfolio is not balanced by performance-directed feedback i.e., on accomplishments. In the dossier portfolio, the comments received do not seem to correlate with performance, which may lead to a discrepancy between the comments given and the behavioural effects realised. This can be explained by the fact that the dossier is primarily focused on appraisal and testing of performance rather than on improvement. A similar relationship is apparent for the course-related and reflective portfolios, the reflective portfolio shows the highest levels. Thus, focusing exclusively on behavioural outcomes may not achieve higher (performance) outcomes. In the reflective portfolio, a high value is placed on deliberation, search for explanation and reasoning about performance. In this way the individual compiling the portfolio may acquire insights about improving performance and find ways to implement improvement. This entails close involvement in the process of portfolio construction.

Discussion

This study has focused on whether different types of portfolios are effective interventions in learning, development and performance improvement. Three types were identified: the dossier portfolio as a collection of mandated evidence on performance, the course-related learning portfolio in which evidence on the attainment of targeted

goals is evaluated, and the reflective portfolio in which personal goals for development of competence are monitored and scrutinised. The hypothesis on which the study was based is that outcome criteria are affected by type of portfolio. Indeed, a strong relation was found between type of portfolio and perceived benefits. However, type of portfolio contributes differently to the effect criteria; especially when learning from feedback and performance improvement in practical and work-related situations are concerned.

A comparison of the data from the three portfolio instruments with regard to professional learning shows that a strong preoccupation with performance appraisal may be counter-productive for learning and development purposes. More fruitful are the insights, reasoning and deliberations a portfolio user is able to link to performance that determine whether the need for performance improvement will be recognised and accepted. These insights are part of a (reflective) appraisal process pointing to a preferred use of portfolios as tools for development and learning that provides a framework for professional learning. The embeddedness of performance appraisal is established through collecting, processing and appraising the information in which the professional is involved. As powerful instruments to support and document this development process, portfolios are valuable tools.

When professionals are not involved in their own appraisal, however, there is the danger that feedback will be directed at those aspects regarded as relevant or fair by the portfolio collector. Only the course-related learning portfolio is oriented in part towards the personal learning goals of the portfolio collector because it fulfils mandated programme requirements. This external scheme, however, may not facilitate a close inspection of the collected evidence, as is the case in the reflective portfolio.

The data from this study support a view of portfolio construction in which the individual benefits from the process by closely linking intentions with collection of evidence and consideration of the aspects that are relevant to the collector. In our view, the most important feature of portfolios is that they provide for control over learning by helping professionals to establish and identify strengths and weaknesses in their development. In this respect, assessment is a bridging tool between learning needs and actual competence levels (Byham, 1996; Marshall, 1992; Wiggins, 1993). Actively collecting information, as well as deliberating about it, lies at the heart of portfolio construction.

A reflective use of the portfolio instrument is an effective instrument for performance monitoring and a valuable tool for redirecting learning (Tomlinson and Saunders, 1995; Smith and Tillema, 1998).

Putting portfolios to use essentially means setting the goals for learning and reflection first (Gipps, 1994) and then focusing on the experiences that provide a framework for work-related learning (Redman, 1994; Fisher and King, 1995). In cases where this self-initiated process may fall short, portfolio feedback by mentors may provide a better conceptual understanding of growth in learning. Without coaching or supervision, the process of constructing portfolios may not be as instructive as it could be (Winsor *et al.*, 1999). A collaborative or mutual appraisal process seems more conducive to pursuing the goals that need to be addressed. Therefore, to provide a good tool for the delivery process of portfolios—regardless of whether an individual or an external source initiates or collects the information—the portfolio needs to be framed and structured so it integrates the collected experience in a way that will facilitate further development.

References

- Bennet, R.E. and Ward, W.C. (1993), *Construction vs. Choice in Cognitive Measurement: Issues in Performance Testing and Portfolio Assessment*. (Hillsdale, NJ: Lawrence Erlbaum).
- Boud, D. (1995), *Enhancing Learning Through Self Assessment* (London: Kogan Page).
- Butler, D.L. and Winne, P.H. (1995), 'Feedback and Self-Regulated Learning: A Theoretical Synthesis', *Review of Educational Research*. 65, 245–81.

- Byham, W.C. (1996), *What is an Assessment Center?: Method, Application and Technologies* (Los Angeles: Development Dimensions International).
- Collins, M. (1996), 'Current Trends in Adult Education, from Self Directed Learning to Critical Theory', in G.D. Benson and B.E. Griffith (eds), *Process, Epistemology and Education* (Toronto: Canadian Scholar Press).
- Delandshere, G. and Petrovsky, A. (1998), 'Assessment of Complex Performances: Limitations of Key Measurements Assumptions', *Educational Researcher*, **27**, 14–24.
- Fisher, C.F. and King, R.M. (1995), *Authentic Assessment: A Guide to Implementation* (Thousand Oaks: Corwin).
- Gipps, C.V. (1994), *Beyond Testing* (London: The Falmer Press).
- Graves, D.H. and Sunstein, B.S. (1992), *Portfolio Portraits* (Portsmouth: Heinemann Books).
- Hamilton, M.L. (1998), *Reconceptualizing Teaching Practice: Self Study in Teacher Education* (New York: Corwin Press).
- Heartel, E.H. (1990), 'Performance Tests, Simulations and Other Methods', in J. Millman and L. Darling-Hammond (eds), *The New Handbook of Teacher Evaluation* (Newbury Park, CA: Sage).
- Herman, J.L. and Winters, L. (1994), 'Portfolio Research: A Slim Collection', *Educational Leadership*, **52**, 48–55.
- Herriot, P. (1989), *Assessment and Selection in Organizations: Methods and Practice for Recruitment and Appraisal* (Chichester: John Wiley).
- Jones, R.G. and Whitmore, M.D. (1995), 'Evaluating Developmental Assessment Centers as Interventions', *Personnel Psychology*, **48**, 377–88.
- LaBoskey, V. (1997), 'Teaching to Teach with Purpose and Passion: Pedagogy for Reflective Practice', in J. Loughran and T. Russell (eds), *Teaching about Teaching* (London: Falmer Press).
- Marshall, S.P. (1992), 'Foreword', in J.L. Herman, P.R. Aschbacher and L. Winters (eds), *A Practical Guide to Alternative Assessment* (Los Angeles: Regents of the University of California).
- Olson, M.W. (1991), 'Portfolios: Education Tools', *Reading Psychology: An International Quarterly*, **12**, 73–80.
- Peterson, K.D. (1995), *Teacher Evaluation* (Thousand Oaks: Corwin Press).
- Redman, W. (1994), *Portfolios for Development: A Guide for Trainers and Managers* (London: Kogan Page).
- Smith, K. (1998), 'Portfolios as an Alternative Assessment Practice in Higher Education', in J.E. Forster (ed.), *University Teaching* (New York: Garland Publishing Inc.).
- Smith, K. and Tillema, H.H. (1998), 'Evaluating Portfolio Use as a Learning Tool for Professionals', *Scandinavian Journal of Educational Research*, **41**, 193–205.
- Swanson, D.B., Norman, G. and Linn, R.L. (1995), 'Performance Based Assessment: Lessons from the Health Profession', *Educational Researcher*, **24**, 5–11.
- Tillema, H.H. (1998), 'Design and Validity of a Portfolio Instrument for Professional Training', *Studies in Educational Evaluation*, **24**, 263–78.
- Tomlinson, P. and Saunders, S. (1995), 'The Current Possibilities for Competence Profiling in Teacher Education', in A. Edwards and P. Knight (eds), *The Assessment of Competence in Higher Education* (London: Kogan Page).
- Topping, K. (1998), 'Peer Assessment between Students in Colleges and Universities', *Review of Educational Research*, **68**, 249–76.
- Wade, R.C. and Yarbrough, D.B. (1996), 'Portfolios: A Tool for Reflective Thinking in Teacher Education', *Teaching and Teacher Education*, **12**, 63–79.
- Wiggins, G. (1993), *Assessing Student Performance: Exploring the Purpose and Limits of Testing* (San Francisco: Jossey-Bass).
- Winsor, P., Butt, R.L. and Reeves, H. (1999), 'Portraying Professional Development in Preservice Teacher Education', *Teachers and Teaching*, **5**, 9–33.
- Wolf, D., Bixby, J., Glenn, J. and Gardner, H. (1991), 'To Use their Minds Well', in G. Grant (ed.), *Review of Research in Education* (Vol. 17, pp. 31–74) (Washington, DC: AERA).
- Wood, R. (1994), 'Work Samples Should be More Used (and Will Be)', *International Journal of Selection and Assessment*, **2**, 166–72.