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ABSTRACT

Portfolios have gained wide acceptance as a learning and assessment tool. Yet, little research has been reported on the practices of teachers who are actually using portfolios within their classrooms and how those practices are moderated by contextual variables. This research examined the instructional, learning, and assessment roles of student portfolios, and explored, from the perspective of the classroom teacher, variations in portfolio applications associated with teaching level (primary versus intermediate) and classroom environment (self-contained versus multiage/teaming). Teachers for kindergarten through grade 5 in 3 elementary schools (n=314) completed a survey questionnaire regarding the instructional and assessment uses to which portfolios are put within their classrooms. To further examine patterns of portfolio use, a subset of 44 teachers was interviewed to explore teacher perceptions about the impact of student portfolios on themselves and their students. Results suggest that these teachers make deliberate decisions regarding uses of their students' portfolios, decisions that appear heavily impacted by the maturity or skill level of the child, the purposes of the application, and the classroom environment within which the application occurs. They also depend on whether the portfolio product is in a formative state (working portfolio) or final state (performance portfolio). (Contains 7 tables and 14 references.) (Author/SLD)

The Application of Student Portfolios in Primary/Intermediate and Self-Contained/Multi-Age Team Classroom Environments: Implications for Instruction, Learning, and Assessment

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ABSTRACT

Portfolios have gained wide acceptance as a learning and assessment tool. Yet, little research has been reported on the practices of teachers who are actually using portfolios within their classrooms and how those practices are moderated by contextual variables. This research examined the instructional, learning and assessment roles of student portfolios; and explored, from the perspective of the classroom teacher, variations in portfolio applications associated with teaching level (primary versus intermediate) and classroom environment (self-contained versus multi-age/teaming).

K-5 teachers in 13 elementary schools completed a survey questionnaire regarding the instructional and assessment uses to which portfolios are put within their classrooms. To further examine for patterns of portfolio use, a subset of teachers was interviewed to explore the perceptions that teachers hold about the impact of student portfolios on themselves and on their students. The results suggest that K-5 teachers make deliberate decisions regarding uses of their students' portfolios, decisions that appear heavily impacted by the maturity or skill level of the child, the purposes of the application, and the classroom environment within which the application occurs. They also depend on whether the portfolio product is in a formative state (working portfolio) or final state (performance portfolio).

The Application of Student Portfolios in Primary/Intermediate and Self-Contained/Multi-Age Team Classroom Environments: Implications for Instruction, Learning and Assessment

Arter and Spandel (1992) define a student portfolio as "a purposeful collection of student work that tells the story of the students' efforts, progress, or achievement in (a) given area(s)." It represents an important alternative to multiple-choice and other structured formats tests, an alternative that potentially captures a richer array of what students know and can do and portrays the processes by which the work is done (Arter & Spandel, 1992; Gilman & McDermott, 1004: Johns & Van Liersburg, 1992).

Student portfolios have been described as "...a powerful tool for the enhancement of instruction and assessment; addressing educator's concerns about authentic assessment, documentation of academic progress, and teacher and student involvement" (Valencia & Calfee, 1991, p. 333). In their fullest elaboration, student portfolios become what Paulson, Paulson and Meyer (1991) term an "intersection" of instruction and assessment, permitting teaching and evaluation experiences to be woven together for the optimization of learning.

Portfolios can be as varied as the classrooms in which they are found and as the children who create and work with them (Paulson et al., 1991). Teachers differ considerably in the manner in which they frame their portfolio design, and implementation may range from intensive commitments, with portfolios being a dominant feature of the instructional day, to situations in which portfolios are hardly more than manila folders holding assorted papers (Calfee & Perfumo, 1993). As instructional decision makers, teachers make deliberate decisions about the role of portfolios in their classrooms, leaning toward certain applications and away from other applications.

It is clear that, as Valencia and Calfee (1991, p. 334) contend, "the portfolio metaphor has captured the educational imagination," and that both the leadership and enthusiasm that drive the portfolio movement spring primarily from regular classroom teachers. However, little is known about variations in portfolio usage among teachers in response to critical contextual features of the school and classroom. The purpose of this research, therefore, was to examine the instructional, learning and assessment roles of student portfolios within elementary classrooms; and to explore, from the perspective of the classroom teacher, variations in portfolio applications associated with teaching level (primary versus intermediate) and classroom environment (self-contained versus multi-age/teaming).

Perspective

Calfee and Perfumo (1993) observed that the portfolio approach provides classroom teachers with a greater sense of ownership over their instructional programs and can lead them to rethink the meaning of their work. In describing her school's effort to implement a portfolio project focused on the assessment of children's learning, Hebert (1992) observed "we soon found ourselves undergoing an intensive assessment of our teaching, our beliefs about children, and our views of the school and its relationship to our community" (p. 60). Valencia and Calfee (1993) note that the portfolio movement must be seen not simply as an assessment effort, but rather as a broad based effort in instructional improvement that calls for substantive, concurrent professional development in curriculum, instruction and assessment. Indeed, in its various applications, the portfolio approach can be viewed as congruent with other major reform elements, including cooperative learning, school-based decision-making and the professionalization of teaching (Calfee & Perfumo, 1993).

Portfolios are typically seen as congruent with a process approach to learning that emphasizes the developmental aspects of student experience through the illustration of growth (Gilman & McDermott, 1994; Hebert, 1992; Johns & Van Leirsburg, 1992; Manning & Manning, 1995; Paulson et al., 1991; Stone, 1994/95). Purported advantages of student portfolio usage include: (a) permitting more authentic assessment of student learning (Calfee & Perfumo, 1993; Glazer, 1994; Johns & Van Leirsburg, 1992; Valencia, 1990; Valencia & Calfee, 1991), (b) promoting student reflection and self-evaluation (Gilman & Hassett, 1995; Gilman & McDermott, 1994; Hebert, 1992; Swicegood, 1994; Valencia 1990); (c) facilitating teacher-student, teacher-parent and student-parent communication (Calfee & Perfumo, 1993; Kasse, 1994; Valencia, 1990), and (d) encouraging students to take charge of their own learning (Paulson et al., 1991; Swicegood, 1994).

Method

K-5 teachers in 13 elementary schools completed a survey questionnaire regarding the content of student portfolios, the instructional and assessment uses to which portfolios are put within their classroom, and their views concerning portfolio-based learning. To further examine for patterns of portfolio use, a subset of the teachers was interviewed; these one-on-one interviews focused on an exploration of the perceptions that teachers hold about the impact of student portfolios on themselves as teachers and on their students.

Instrument Development

Survey Questionnaire. Items were drafted following a comprehensive review of the literature on student portfolios; the review covered organization, content, functions and applications of portfolios, as well as purported strengths and weaknesses of portfolio approaches in the classroom. The resulting items were then examined by a focus group of 12 elementary

classroom teachers and reading supervisors for clarity and relevance to portfolio-based instruction and learning. The items on the survey were organized by function. Some were fitted with categorical response options (e.g, Yes/No), others with multi-point scales (e.g., Not Important, Of Minor Importance, Moderately Important, Very Important), as befit the focus of the items. After minor revisions, the survey instrument was finalized for use with teachers.

Interview Schedule. Interview questions were drawn from the same literature backdrop as were the survey items. The interview questions permitted probing of such areas as (1) the criteria for inclusion of materials in portfolios, (2) the role of portfolios in marking and grading, (3) the impact of portfolios on students' self-evaluation, work habits, motivation and academic performance, (4) the impact on teachers' instructional planning and delivery, and on their evaluation strategies, and (5) the impact on teachers' communication and interaction with parents, student and other teachers.

Data Collection

Survey Questionnaire. The instrument was administered to full-time, K-5 teaching faculty from 13 elementary schools sampled from a mid-size school district in Florida. The schools were in the fifth year of implementation of a student portfolio system that included both working portfolios and performance portfolios organized primarily for reading/language arts. Working portfolios typically hold a wide variety of student work, most of which is unfinished or in the process of revision or evaluation by the teacher. The performance portfolios typically contained student running records, comprehension checks, reading logs, and finished writing samples. Student work in the performance portfolio is usually selected from the working portfolio. It is the performance portfolio that follows the student from year to year. The

questionnaire was administered in May of 1996 in each school by the school's reading specialist, with the faculty assembled as a group.

Of the 470 full-time teaching faculty, 314 completed the questionnaire (response rate of 67%). The majority of the respondents were female (96%) and held Bachelor's degrees (78%). The median number of years teaching was 8.5. Forty-eight percent taught in primary (K-2), 46% taught in intermediate (3-5), and 6% taught across K-5. Forty-five percent were in self-contained classrooms, 40% in multi-age classrooms with teacher-teams, and 9% in ESE settings. The multi-age/teacher team structure is organized in terms of a primary "house" and an intermediate "house." Each "house" is comprised of a team of three or more teachers who collaborate on all aspects of teaching and are collectively responsible for the continuous progress of a child during that child's three-year journey through the "house" (either K-2 or 3-5). Each of the 13 participating schools had teachers who worked in a self-contained classroom environment and other teachers who worked in a multi-age teaming context; the ratio was about forty to sixty.

Interview Schedule. Forty-four K-5 teachers from three of the 13 participating schools were interviewed. Approximately equal numbers were interviewed at each school. The one-on-one interviews were conducted in May of 1996 by a measurement professor and a doctoral student in measurement at the University of South Florida. The three schools were chosen to reflect variations in geographical location, size, and percentage of students on free or reduced lunch, thereby representing the diversity on these variables in the total set of 13 schools. Of the 44 teachers, 22 were at the primary level and 22 at the intermediate level. Sixteen of the teachers worked in self-contained classrooms; 28 worked in a multi-age, teacher team context.

Results

The results of the research are reported in terms of on the uses to which student portfolios are put in the classroom, their impact on teachers and students, and the association between usage and the contextual variables of teaching level and classroom environment.

Portfolio Contents

The teachers were asked to rate how frequently certain items were placed in their students' performance portfolios and working portfolios, using a 4-point scale (never, sometimes, often, always). The teachers indicated that the items often or always places in performance portfolios were written work (78% of respondents), test quizzes, research projects/reports (32%), worksheets (29%) and art work/drawings (24%). Only 16% included attitudinal information. Fewer than 10% reported that they often or always included such items as awards, photographs, computer discs, and audio/video tapes. A similar pattern of inclusion was reported for working portfolios. (See Figure 1).

A two-factor MANOVA showed a statistically significant relationship (Wilks' Lambda = .688, F=8.59, < .0001) between teaching level performance portfolio and content, but not between classroom environment and performance portfolio content. (See Table 1). Primary teachers were more likely to include art work/drawings in their students' performance portfolio's. Intermediate teachers were more likely than primary teachers to include research projects/reports and computer discs, reflecting the greater sophistication of their students with complex tasks.

Access to Portfolios

Using a 3-point scale, the teachers rated the access (unlimited, limited, none) given to their students' performance and working portfolios. Access varied across professionals

(teachers, administrators, reading specialists), paraprofessionals, parents and students; and also between performance and working portfolios. Unlimited access to both performance and working portfolios tended to be granted to school administrators, reading specialists and parents. Other teachers, as well as paraprofessionals, were less frequently given unlimited access. Unlimited access to students was much more likely to be granted for working portfolios than for performance portfolios. (See Figure 2).

A two-factor MANOVA (see Table 2) showed a statistically significant relationship between teaching level and access to performance portfolios (Wilks' Lambda = .937, F = 2.52, $p < .0220$) and between classroom environment and access to performance portfolios (Wilks' Lambda = .939, F = 2.43, $p < .0272$). Intermediate teachers were more likely than primary teachers to grant unlimited access to students, no doubt reflecting the greater maturity of their students. Teachers in multi-age/team environments were more likely than self-contained teachers to grant unlimited access to other teachers and paraprofessionals; this greater openness is a natural consequence of the extensive opportunities for cooperation and collaboration among team members in the multi-age/team environment. The same exact patterns of significant relationships across teaching level and classroom environment also held for working portfolios.

Purpose of Portfolios

Using a 4-point scale (very important, moderately important, of minor importance, not important), teachers rated the importance of portfolios with respect to major purposes gleaned from the professional literature. Seventy-two percent rated portfolios as being very important for showing growth or change over time; slightly over half rated them very important for showing the process by which work is done, and for students to show samples of their best work. Forty

percent or fewer rated portfolios very important for representing a collection of students' favorite work, helping students establish goals, and showing that students have met goals or standards. (See Figure 3).

A two-factor MANOVA showed a statistically significant relationship between teaching level and ratings on the importance of portfolio purposes (Wilks' Lambda = .905, F = 3.65, $p <$ .0009) but not between classroom environment and ratings on portfolio purposes. (See Table 3). Primary teachers were more likely than intermediate teachers to endorse portfolios for their importance in showing growth or change over time. The need for demonstrated growth is no more less keen than among K-12 students, thus leading K-12 teachers to favor portfolios for this purpose. The MANOVA produced a statistically significant interaction between teaching level and classroom environment (Wilks' Lambda = ,928, F = 2.69, $p <$ .0105). However, none of the univarite interaction results were statistically significant, making the interpretation of the multivariate interaction difficult to establish.

Specific Classroom Uses

Again, using a 4-point scale (very important to not important), teachers rated the importance of portfolios in carrying out specific classroom functions identified in the literature as possible portfolio applications. One third or more of the teachers rated performance portfolios as very important for such functions as communicating with students, parents and other teachers; diagnosing student strengths and weaknesses; and assigning marks at the end of each grading period. Approximately one-fifth of the teachers rated as very important the functions of designing/planning instruction, evaluating instructional techniques and materials, and promoting student self-evaluation/self-reflection. Only 4% rated the promotion of student peer evaluations

as very important. The pattern of ratings for working portfolios mirrored those for performance portfolios; however, working portfolios were rated as very important by consistently larger percentages of teachers for addressing all of the functions noted above. (See Figure 4).

A two-factor MANOVA showed a statistically significant relationship between teaching level and ratings of the importance of performance portfolios for specific classroom functions (Wilks' Lambda = .736, $F = 6.30$, $p < .0001$), but not between classroom environment and ratings of importance. (See Table 4). Primary teachers were more likely than intermediate teachers to endorse performance portfolios for many of the classroom functions listed above, including monitoring weekly progress, diagnosing student strengths and weaknesses, assigning marks and communicating with parents and other teachers other teachers about students' work. Primary and intermediate teachers did not differ on those applications rated lower in importance, such as promoting student self-evaluation/self-reflection or peer evaluation.

A two-factor MANOVA also showed a statistically significant relationship between teaching level and ratings of the importance of working portfolios for the specific classroom functions (Wilks' Lambda = .878, $F = 2.35$, $p < .0075$) but not between classroom environment and ratings of importance. (See Table 5). Primary teachers were more likely than intermediate teachers to endorse working portfolios for assigning marks, and for communicating with parents and other teachers.

Frequency of Use

The teachers were asked to rate the frequency with which certain classroom-related activities occurred with student portfolios, using a 5-point scale (weekly, monthly, quarterly, yearly, not at all). The patterns of ratings indicate that students are given the opportunity to

make decisions more frequently about their working portfolios than about their performance portfolios. The results also indicate that teachers conference with individual students about their working portfolios more frequently than about their performance portfolios. Finally, the results indicate that teachers share information from students' portfolios with reading specialists far more frequently than they share with either parents or other teachers. Except for the activity of sharing portfolio information with reading specialists, none of the activities above were rated by more than a small percentage of teachers as occurring on a weekly or monthly basis. Most of the activities were rated as occurring typically on a quarterly or yearly basis. When asked how frequently students share their working portfolios with other students, fully 70% of the teachers indicated not at all. (See Figure 5).

A two-factor MANOVA (see Table 6) showed a statistically significant relationship between teaching level and frequency of use (Wilks' Lambda = .824, $F = 5.05$, $p < .0001$); and between classroom environment and frequency of use (Wilks' Lambda = .820, $F = 5.19$, $p < .0001$). Primary teachers reported sharing information in the students' portfolios with other teachers and reading specialists with greater frequency than intermediate teachers, and also conferencing with individual students regarding their working portfolios. Relative to primary teachers, intermediate teachers reported the following activities as occurring with greater frequency: Students making decisions about their performance and working portfolios, students sharing their working portfolios with other students. The more frequent occurrence of student-controlled activity with portfolios at the intermediate level appears consistent with the greater maturity of intermediate students compared to primary students.

Relative to teachers in self-contained environments, those in multi-age/team environments reported a greater frequency of use for portfolios on most of the activities surveyed, including conferencing with individual students regarding their working portfolios, students making decisions about their performance and working portfolios, students sharing their working portfolios with other students, and the teacher sharing portfolio information with other teachers.

Evaluating Portfolios

Drawing on the literature for patterns or characteristics often cited as factors in the evaluation of portfolios, the investigators asked the teachers to rate on a 4-point scale (very important to not important) the importance of selected elements when evaluating items in a student's portfolio. Three quarters rated growth in performance as very important and two-thirds rated quality of individual pieces as very important. Approximately half rated as very important the variety in the kinds of things included and indications of a change in attitude or behavior. Only a third of the teachers rated as very important such elements as quality and depth of self-reflection, and the amount of information included. (See Figure 6).

A two-factor MANOVA showed a statistically significant relationship between teaching level and the importance of selected elements for evaluating portfolios (Wilks' Lambda = .946, $F = 2.30$, $p < .0354$), but not between classroom environment and the importance of selected evaluation elements. (See Table 7). Primary teachers were more likely than intermediate teachers to rate each of the following elements as important for evaluating items in students' portfolios: Amount of information included and growth in performance as indicated by products/materials included. The high importance given by primary teachers to using portfolios

for evaluating student growth reflects the great need for demonstration of growth in the early grades.

Impact of Portfolios

For an exploration of the perceptions that teachers hold about the impact of student portfolios on themselves as teachers and on their students, 44 of the teachers completed one-on-one interviews. The results are summarized below:

Impact on Students. When asked whether the use of portfolios has impacted their students' skills in self-reflection, 59% of the interviewees responded affirmatively; several spoke of the value to students of being able to look back and see their progress documented within the portfolios. In regard to students' cooperative skills and work habits, 50% spoke of a positive impact from portfolios, mainly in the area of work habits. Sixty-one percent reported that student effort and motivation had been positively impacted, and 50% reported a facilitative effect on students' academic performance; reasons most frequently given were students' awareness that their parents and teachers will see the portfolio contents and the impetus that comes from the students' ability to see progress in their work.

Impact on Communication. In the area of communication with parents, students and other teachers, portfolios were seen as having considerable impact. Most prominently cited was the facilitation of parent-teacher communication. Fully 89% of the interviewees spoke of the value of portfolios in parent conferencing and related activities with parents; the opportunity that portfolios provide for showing examples of the child's work was mentioned as a particular strength. A number of teachers stated that portfolios are the center piece of their parent conferences. In the area of communication with students, 59% spoke approvingly of portfolios.

As in the case of parent-teacher communication, the value of having documented examples of the students' work was frequently cited as a strength of portfolio-based student conferencing. Sixty-six percent of the interviewees expressed the belief that portfolios helped in the area of communication with other teachers; most of these teachers worked within a multi-age/team environment. Only a few of the interviewees in self-contained classrooms spoke of portfolios as being useful for teacher-teacher communication.

Impact Teaching and Assessment The interviewees were asked what changes they had observed in their teaching since implementing a portfolio system in their classroom. Sixty-four percent reported noting a positive effect on their teaching. Several said that portfolios served to focus their teaching on students' areas of weaknesses and to help in their instructional planning, either for group instruction or for individual students. The interviewees gave the portfolio system high marks for its role in focusing them on the needs of individual students; 70% identified portfolios as helpful in this area. Fifty-nine percent of the interviewees also reported an impact of portfolios on their student assessment techniques. Several credited portfolios with helping them to more closely monitor students' growth over time and to better organize their grading and evaluation practices. Fully 70% of the interviewees reported using portfolios in deriving grades for report cards and progress reports.

Problems in Implementation

When asked about problems in the use of portfolios, interviewees identified time as the major drawback; 64% spoke of time constraints in applying portfolios in their classrooms. Related to the time management issue was the perception on the part of some interviewees that a portfolio approach to instruction and learning generated more paper work, some of which was

seen as redundant and unnecessary. This led some interviewees to observe that teaching had become more complicated with the advent of portfolios. Even so, a number of interviewees noted that while time consuming, portfolios were nevertheless worthwhile.

Summary and Conclusions

Much has been written about the conceptual bases, recommended content and possible uses of student portfolios, as well as the practical problems of initiating and monitoring portfolios (Johns & Van Leirsburg, 1992). Portfolios have gained wide acceptance as a learning and assessment tool, particulary in the language arts. Yet, little research has been reported on the practices of teachers who are actually using portfolios within their classrooms and how those practices may be moderated by contextual variables. This research employed two distinct but complementary data collection methods (survey questionnaire and personal interview), and examined portfolio applications associated with teaching level and classroom environment to produce a more complete picture of the place student portfolios occupy in classroom instruction, learning and assessment.

Consistent with the findings of Calfee & Perfumo (1993) and Valencia (1990), data from the survey of portfolio usage show that a clear majority of the K-5 teachers surveyed see the value of portfolios for communicating with students, parents and other teachers. Portfolios were seen by the majority of interviewees as having a considerable impact on communications with parents, most prominently in the facilitation of parent conferencing. Also noted, particularly among those teachers working in a multi-age/team environment, was the value of portfolios for enhancing teacher-to-teacher communication.

Portfolios are viewed by the great majority of the K-5 teachers surveyed as important for showing student growth over time, for showing samples of student work, and for revealing the process by which the work is done. Not surprisingly, the majority of K-5 teachers rated growth in performance of paramount importance in evaluating student portfolios. Like Gilman and McDermott (1994), Johns and Van Leirsburg (1992), and Paulson, et al. (1991), the investigators found that teachers view portfolios as congruent with a process approach to learning that places emphasis on the developmental value of student experience. It is this characteristic of portfolios that gives teachers confidence in applying portfolios in diagnosing student strengths and weaknesses and in assigning marks.

Promoting student self-reflection and self-evaluation is an oft cited strength of portfolio-based activity and learning (Gilman & Hassett, 1995; Gilman & McDermott, 1994; Hebert, 1992; Swicegood, 1994; Valencia, 1990). The majority of K-5 teachers who were interviewed about the impact of student portfolios noted a positive effect on students' effort and motivation; these effects were attributed to the students' awareness that their parents and teachers will see the portfolio contents and to the impetus that comes from students' ability to see progress in their own work. Yet among those surveyed, relatively few teachers placed great importance on the reflective or motivational value of portfolios, as compared to applications in the areas of communications, diagnosis and grading. This apparent discrepancy between interview and survey data may be an artifact of instrumentation. The survey required the respondent to assign ratings of importance across 11 distinct uses of portfolios, thus permitting implicit normative comparisons, whereas the interview schedule simply addressed an isolated

question (e.g., "In your classroom, how has the use of portfolios impacted your students' skills in self-reflection/self-evaluation?")

In terms of the frequency of occurrence of selected portfolio-related activities, some activities, such as students making decisions about their working portfolios and teachers sharing portfolio information with reading specialists, tend to occur on a weekly or monthly basis, whereas others, such as students making decisions about their performance portfolios and students and teachers sharing portfolio information with parents, tend to happen more on a quarterly or yearly basis. The variations in the frequency with which certain portfolio activities occur no doubt reflect teacher judgement as to the usefulness or appropriateness of given portfolio applications and their expected results.

Most of the K-5 teachers reported granting unlimited access to their students' portfolios for school administrators and reading specialists, as well as for other teachers and parents; the patterns of access were quite similar across both working and performance portfolios. However, student access differed strikingly between the two portfolio types; only a quarter of the teachers reported granting unlimited access to students for performance portfolios, while almost two-thirds indicated that they provided such access to students for working portfolios. This finding attests to a recognition on the part of teachers of the different functions served by portfolio types in the instructional/learning process. Because it contains incomplete tasks and work in progress, the working portfolio requires greater accessibility by students, as compared to the performance portfolio with its summative content. This difference is also reflected in the fact that teachers are prone to permit students to make more frequent decisions about their working portfolios. To the extent that portfolios are credited with encouraging students to take charge of their own learning and become more actively engaged in the learning process (Paulson, et al., 1991;

Swicegood, 1994), it is the working portfolio that provides the vehicle of engagement for these teachers.

The majority of interviewees reported that student portfolios had a positive effect on their teaching, specifically by serving to focus their teaching on areas of student need. The majority also credited portfolios with impacting their assessment practices by helping them to monitor students' growth over time and by faciliating marking and grading.

Clearly the major drawback that the teachers identified with the use of portfolios centered on the heavy time requirement of portfolio-based activities. Time constraints were cited by two-thirds of the interviewees as a problem in applying portfolios in their classrooms. In this respect, the portfolio phenomenon is no different from other reform movements in education (Calfee & Perfumo, 1993). The student portfolio provides a vehicle for impacting numerous aspects of the classroom environment. It can lead teachers to rethink what they are doing, and how and why they are doing it (Hebert, 1992). Small wonder that a commitment to portfolio-based instruction, learning and assessment may be viewed negatively by some teachers in terms of time and effort expended.

Teaching level effects (primary versus intermediate) were found for all major aspects of portfolio use, including the content placed in portfolios, access granted to portfolios, specific classroom applications, frequency of use, and elements emphasized in portfolio evaluation. These effects seemed to be reflective of the greater maturity and sophistication of students at the intermediate level, and of the greater emphasis on demonstration of growth among teachers in the early grades.

Effects of classroom environment (self-contained versus multi-age/team) were found in two areas of portfolio use: Access to portfolios and the frequency with which certain classroom-

related activities occurred. These effects favored the multi-age/team environment, reflecting the more extensive opportunities for cooperation and sharing among teaming teachers.

The results of this investigation suggest that K-5 teachers make deliberate decisions regarding the instructional, learning and assessment uses of their students' portfolios, decisions that lead them to favor certain applications over others. These decisions appear to be heavily impacted by the maturity or skill level of the child, the purposes of the application, and the classroom environment (self-contained versus multi-age/team) within which the application occurs. They also depend on whether the portfolio product is in a formative state (working portfolio) or final state (performance portfolio) of readiness.

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Table 1

MANOVA and Univariate ANOVA's on Performance Portfolio Content by Teaching Level (TL) and Classroom Environment (CE)

Multivariate Statistics				
Effect	Wilks' Lambda	df	F	p
TL	.688	11, 208	8.59*	.0001
CE	.920	11, 208	1.65	.0872
TL x CE	.946	11, 208	1.09	.3740

Univariate F Tests for TL Effects (df = 1, 218)			
Performance Portfolio Content		F	p
a.	written work	0.23	.6326
b.	art work/drawings	7.70*	.0060
c.	research projects/reports	62.71*	.0001
d.	tests/quizzes	0.07	.7989
e.	awards	3.69	.0559
f.	photographs	0.01	.9411
g.	video tapes	0.92	.3386
h.	audio tapes	0.32	.5730
i.	computer discs	8.00*	.0051
j.	attitudinal information	2.02	.1569
k.	worksheets	1.41	.2357

*$p < .05$

Table 2

MANOVA and Univariate ANOVA's on Access to Performance Portfolios by Teaching Level (TL) and Classroom Environment (CE)

Multivariate Statistics				
Effect	Wilks' Lambda	df	F	p
TL	.937	6, 224	2.52*	.0220
CE	.939	6, 224	2.43*	.0272
TL x CE	.959	6, 224	1.59	.1498

Univariate F Tests for TL Effects (df = 1, 229)			
Access to Performance Portfolios		F	p
a.	The student	7.40*	.0070
b.	Other Teachers	3.34	.0691
c.	Paraprofessionals	0.28	.5963
d.	School Administrators	0.15	.7021
e.	Reading Specialists	.068	.4107
f.	The parents	.062	.4305

Univariate F Tests for CE Effects (df = 1, 229)			
Access to Performance Portfolios		F	p
a.	The student	0.48	.4869
b.	Other Teachers	10.11*	.0017
c.	Paraprofessionals	7.37*	.0071
d.	School administrators	0.07	.7859
e.	Reading specialists	0.32	.5703
f.	The parents	.047	.4951

*p < .05

Table 3

MANOVA and Univariate ANOVA's on Purpose of Portfolios by Teaching Level (TL) and Classroom Environment (CE)

Multivariate Statistics				
Effect	Wilks' Lambda	df	F	p
TL	.905	7, 243	3.65*	.0009
CE	.961	7, 243	1.41	.2032
TL x CE	.928	7, 243	2.69	.0105

Univariate F Tests for TL Effects (df = 1, 249)			
Purpose of Portfolios		F	p
a.	To show growth or change over time	10.51*	.0014
b.	To show process by which work is done as well as final product	0.00	.9839
c.	To trace the development of projects/products	0.02	.8900
d.	For students to show sample of their best work	0.98	.3236
e.	To help students establish goals	0.17	.6825
f.	For students to show they have met goals/standards	0.11	.7381
g.	For student to create a collect of their favorite work	3.02	.0836

*p < .05

Table 4

MANOVA and Univariate ANOVA's on Specific Applications of Performance Portfolios by Teaching Level (TL) and Classroom Environment (CE)

Multivariate Statistics				
Effect	Wilks' Lambda	df	F	p
TL	.736	12, 211	6.30*	.0001
CE	.922	12, 211	1.49	.1306
TL x CE	.929	12, 211	1.34	.1976

Univariate F Tests for TL Effects (df = 1, 222)			
Performance Portfolio Applications		F	p
a.	Monitoring the week to week progress of your students	25.26*	.0001
b.	Diagnosing student strengths and needs	11.65*	.0008
c.	Assigning marks at the end of each grading period	39.02*	.0001
d.	Promoting student self-evaluation and reflection	1.98	.1609
e.	Promoting student peer evaluations	.05	.8162
f.	Motivating students	2.32	.1294
g.	Designing or planning instruction	2.46	.1184
h.	Evaluating your instructional techniques	2.57	.1102
i.	Evaluating instructional materials	3.45	.0644
j.	Communicating with students about their work	2.23	.1370
k.	Communicating with parents about their child's work	14.84*	.0002
l.	Communicating with other teachers about students' work	11.53*	.0008

*$p < .05$

Table 5

MANOVA and Univariate ANOVA's on Specific Applications of Working Portfolios by Teaching Level (TL) and Classroom Environment (CE)

Multivariate Statistics				
Effect	Wilks' Lambda	df	F	p
TL	.878	12, 203	2.36*	.0075
CE	.908	12, 203	1.71	.0675
TL x CE	.907	12, 203	1.73	.0620

Univariate F Tests for TL Effects (df = 1, 214)			
Working Portfolio Applications		F	p
a.	Monitoring the week to week progress of your students	0.00	.9823
b.	Diagnosing student strengths and needs	0.27	.6067
c.	Assigning marks at the end of each grading period	7.91*	.0054
d.	Promoting student self-evaluation and reflection	0.02	.8762
e.	Promoting student peer evaluations	0.03	.8615
f.	Motivating students	0.00	.9607
g.	Designing or planning instruction	0.08	.7769
h.	Evaluating your instructional techniques	0.36	.5468
i.	Evaluating instructional materials	0.03	.8697
j.	Communicating with students about their work	0.30	.5844
k.	Communicating with parents about their child's work	5.60*	.0188
l.	Communicating with other teachers about students' work	8.87*	.0032

*$p < .05$

Table 6

MANOVA and Univariate ANOVA's on Frequency of Portfolio Use by Teaching Level (TL) and Classroom Environment (CE)

Multivariate Statistics				
Effect	Wilks' Lambda	df	F	p
TL	.824	9, 213	5.05*	.0001
CE	.820	9, 213	5.19*	.0001
TL x CE	.982	9, 213	0.44	.9104

Univariate F Tests for TL Effects (df = 1, 221)			
Performance Portfolio Content		F	p
a.	Your students make decisions about their performance portfolios.	11.04*	.0010
b.	Your students make decisions about their working portfolios.	11.09*	.0010
c.	You conference with individual students regarding their performance portfolios.	0.89	.3465
d.	You conference with individual students about their working portfolios.	10.29*	.0015
e.	Your students share their working portfolios with other students.	7.16*	.0080
f.	Your students share information in their portfolios with their parents.	3.82	.0519
g.	You share information in the students' portfolios with their parents.	1.41	.2368
h.	You share information in the students' portfolios with other teachers.	9.57*	.0022
i.	You share information in the students' portfolios with reading specialists.	6.46*	.0117

Table 6 (continued)

Frequency of use		Univariate F Tests for CE Effects (df = 1, 221) F	p
a.	Your students make decisions about their performance portfolios.	7.60*	.0063
b.	Your students make decisions about their working portfolios.	20.54*	.0001
c.	You conference with individual students regarding their performance portfolios.	2.82	.0945
d.	You conference with individual students about their working portfolios.	4.74*	.0305
e.	Your students share their working portfolios with other students.	7.02*	.0086
f.	Your students share information in their portfolios with their parents.	1.91	.1683
g.	You share information in the students' portfolios with their parents.	0.11	.7405
h.	You share information in the students' portfolios with other teachers.	17.75*	.0001
i.	You share information in the students' portfolios with reading specialists.	0.02	.8975

*p < .05

Table 7

MANOVA and Univariate ANOVA's on Evaluating Portfolios by Teaching Level (TL) and Classroom Environment (CE)

Multivariate Statistics				
Effect	Wilks' Lambda	df	F	p
TL	.946	6, 244	2.30*	.0354
CE	.984	6, 244	0.67	.6711
TL x CE	.980	6, 244	0.83	.5494

Univariate F Tests for TL Effects (df = 1, 249)			
Evaluating Portfolios		F	p
a.	Amount of information included	5.98*	.0151
b.	Quality of individual pieces	0.02	.8797
c.	Variety in the kinds of things included	2.52	.1139
d.	Quality and depth of self-reflection	0.12	.7326
e.	Growth in performance as indicated by products/materials included	4.08*	.0445
f.	Indication of change in attitude or behavior	2.91	.0896

*$p < .05$

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