IMPLICATIONS OF THE 1997 NAEP VISUAL ARTS DATA FOR POLICIES CONCERNING ARTISTIC DEVELOPMENT IN AMERICA'S SCHOOLS AND COMMUNITIES

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Walk Into My World, pastel by Alec Loeb, 1993

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Executive Summary

A visual arts group* formed in 1999 to study statistical data from the 1997 NAEP Arts Assessment, responding to an open invitation at the National Art Education Association conference in Washington, D.C. to apply for funding under a secondary analysis grant. The Department of Education funded three investigative plans that emerged from collaborative planning efforts.

The primary question was, "What are the factor sets derived from 8th grade students' general and art background questionnaire responses and from school level data that are impacting visual arts achievement?" A research model (see Structural Model, next page) was tested and used in hierarchical modeling, regional profiles, and quartile analysis. Three investigators and several consultants worked interactively, sharing findings and decision paths as study proceeded with the NAEP Arts data.

During the grant period, the consortium has maintained an active presence at the national level; we presented aspects of our investigations during the American Education Research Association annual meeting in Seattle in April, 2001 and as part of the research strand of the National Art Education Association annual conferences in Los Angeles in March, 2000 and New York in March, 2001. The grant consortium provided updates on our research to fellow researchers in the arts for their use with research compendiums. *Studies in Art Education* published a series of articles describing findings with a beta version of the data and presenting results of a NAEP replication study organized by Richard Siegesmund. In addition, we have presented NAEP information to colleagues in our states. Sustained professional dialogue proved crucial to the development of the project.

> "Art is one of the powerful elements in human culture, and its evolution has significance not only for its own future but for understanding the larger society as well. Furthermore, the arts are both a symptom and a sign of cultural change, and at no time has this been more evident than today. For the arts, both popular and high, pervade modern societies in unprecedented variety and scope. Moreover, the attention they receive is more focused and the range of their public and their effects is probably greater than at any time since the classical age. Yet the influences are reciprocal, because social and technological developments have themselves deeply affected the practice and experience of the arts."
>
> Berleant, A. (1991). *Art and engagement.* Philadelphia: Temple University Press, 33.

Essentially, we believed that literacy in the visual arts is informed by the values and resources of the home, by active dialogue between parents and educators about their children's school opportunities, by knowledgeable and enthusiastic teachers, by safe and educationally sound schools, by the resources and experiences offered in schools and outside of school in community and arts agency settings, and funding resources for schools which afford reasonable pupil teacher ratios and rich environments for art study. The correlations were indeed robust, though even the "best" students were not reaching the top levels of achievement on art tasks. Regional variations suggested avenues for policy at a more particular level, as partnership needs and inputs differ across the country. Comparisons of high and low quartiles provided a closer look at the tails of student performance; teachers, in particular, can use those findings to make adjustments in their classrooms and to garner external support. The *Report Card* for the 1997 NAEP Arts provided individual indicators of achievement, but secondary analysis of the data revealed strong evidence of interrelated influences. The assessment, occurring at the cusp of the standards infusion, provides a benchmark against which to measure future progress in visual arts education.

* Diket, R.M., Burton, D., McCollister, S., & Sabol, F.R. (2000). Taking another look: Secondary analysis of the NAEP Report Card in the Visual Arts. *Studies in Art Education, 41*(3), 202-207.

Structural Model
for Secondary Analysis
of Visual Arts NAEP Data

Resources

Home

Community & Arts Agencies

School

Demographics

Region (state cluster)

Student

Family

Expanded Art Experiences

Classroom Practices

Teacher Education

Opportunity to Learn

Based upon specific content in
visual arts disciplines
Knowledge and Skills
(RESPONDING AND/OR CREATING)
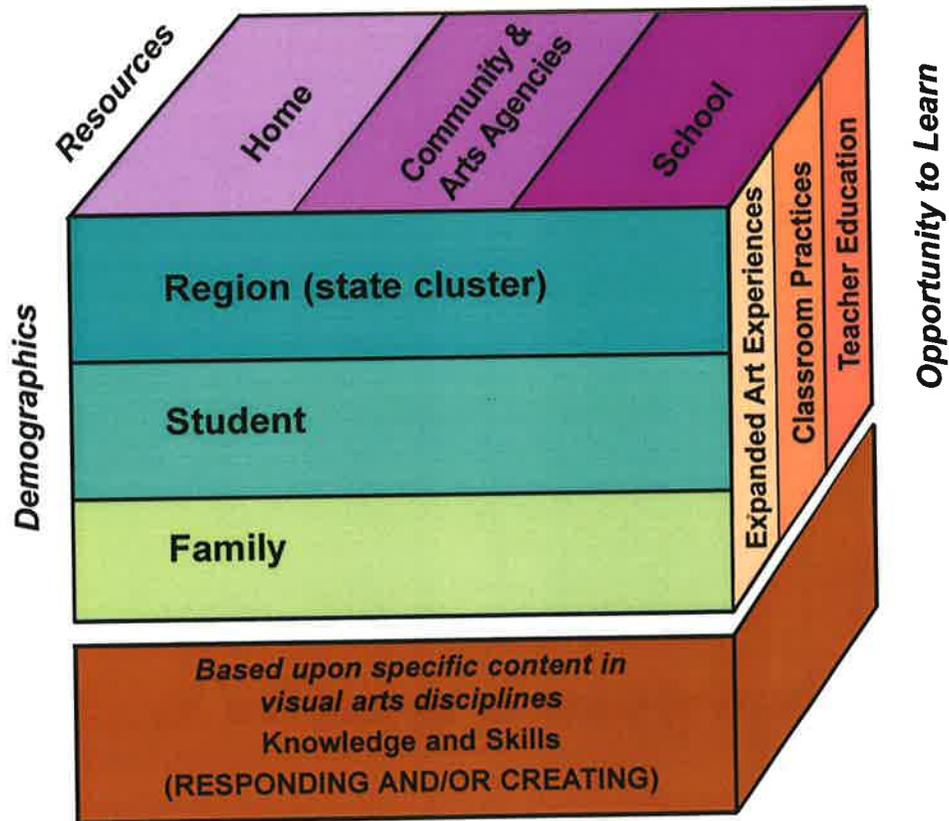
©Diket, Burton, McCollister, & Sabol, October 1999
Final model, October 2001

Confirmatory Factor Analysis of NAEP Visual Arts Data

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Acknowledgements

Confirmatory Factor Analysis of NAEP Visual Arts Data[1]

Read M. Diket

Overview of the Study

A consortium of researchers undertook secondary analysis of 1997 NAEP Arts data to clarify a structure of relationships associated with visual arts achievement among 8th grade students. Items from three NAEP surveys answered by students and school personnel as part of the visual arts assessment were considered as sets of indicators for underlying constructs. Confirmatory factor analysis was used to test a cube model (see Figure 1) presenting demographics (background characteristics), resources, and opportunities to learn categories. Factors within all three categories were found to be significantly related to dependent variables for arts achievement (Responding and Creating). The secondary analysis reported here embraces the rich complexity of the NAEP arts assessment, postulating that coordinated study of its vision, framework, procedures, and data has enormous potential to inform art educators and policy makers, particularly those interested in America's middle schools.
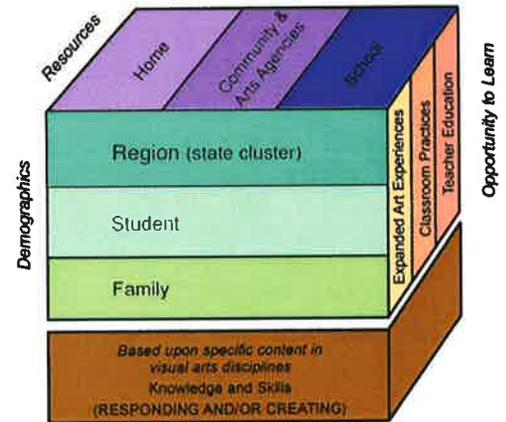
Figure 1.
Structural Model for Secondary Analysis

Toward a Strong Research Base in Art Education

Correlational Study

After several decades of research favoring qualitative designs, a resurgence of quantitative publications in the arts illuminated correlational indicators for academic achievement (i.e., Fiske, 1999; Burton, Horowitz, & Abeles, 2001). The watershed publication *Champions of Change* (Fiske, 1999) presented findings from several studies of "the real world of learning," posing policy implications that had "immediate relevance for both policy and practice in American education today" (p. xi). Importantly, *Champions of Change* authors argued that art resources could be leveling the "playing field" for less advantaged students, having a profound impact on learning outside of schools, and impacting the academic performance of students in urban settings. If, as the author of the summary posited, partnership between arts organizations and schools "can increase student achievement" (p. xi), then field visits to museum and gallery sites ought to be a part of school programming along with project-based art learning opportunities in and outside of school. Opportunities to learn do not assure education; for access to be maximally effective, students must interactively experience the arts and build a sense of community from their participation. Specific findings reported in *Champions of Change* include the Catterall and Waldorf focus on school climate with data from the Chicago Arts Partnerships in Education (CAPE) and the Catterall,

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[1]   The interpretations and opinions expressed in this report are those of the author. No official endorsement by the U.S. Department of Education is intended nor should be implied.

Chapleau, and Iwanga investigation of involvement in the arts and development among secondary students (including eighth graders) with the NELS:88 survey.

Importantly for the NAEP secondary analysis reported here, Catterall, Chapleau, and Iwanga's study of the NELS:88 criterion-referenced test and survey of student participation in the arts and academic achievement in a range of subject areas revealed 24 significant differences favoring students involved in the arts. Observed differences persisted across traditional indicators of economic status and parental education levels. They hypothesized that the arts promote community and a sense of involvement with the larger values of adult society. However, Catterall, et al., noted "a marked absence of indicators of achievement in the arts" (p. 4) and they proposed that arts indicators should be studied in future national surveys. The NAEP arts achievement data and the associated questionnaires answered by students and school representatives provided the needed information to continue previous inquiry into arts domains.

Burton, Horowitz, and Abeles (Burton, Horowitz, & Ables, 2000) sought to learn more about the interactive relationship between arts-based learning and learning in other core subjects. They collected data from 4th through 8th graders (N = 2406 in 12 elementary and middle schools), including information about years of in-school and private arts instruction; in addition, they inferred the degree of arts integration in school curricula and documented collaboration between schools and community arts providers and among teachers in schools. Data was amassed for art involvement, perception of self as learner, and indicators of school climate, along with TTCT (Torrance Test of Creative Thinking) scores. When examining their school samples, these researchers found creative performance more closely associated with arts involvement than with economic status. Self concept scores among students in a high-arts group (based upon years of exposure to art, in-school and/or taking private lessons) were less variable and substantially higher than found with peers in a low-arts group. Positive associations were found for in-school arts and dimensions of affiliation, faculty and student support, innovation and resource allocation. Negative correlations were found between in-school arts and performance goal orientations (associated with centralized administrative structures that stress rules, standardized testing, and academic competition) on a School-Level Environment Questionnaire. Notably, students who were extending school arts learning opportunities by taking private art lessons averaged creativity scores that were 15% higher than peers not taking art outside of school. Qualitative findings suggested that "habits of mind" identified among the high-art students characterize cognitive competencies and dispositions important for school learning. The authors concluded, "Arts learning, involving as it does the construction, interweaving, and interpretation of personal and socio-cultural meaning, calls upon a constellation of capacities and dispositions that are layered and unified in the construction of paintings, drawings, poems, musical compositions, and dances...To diminish [any subject in the core] is to diminish the possibility and promise of them all" (p. 255).

Policy Perspectives

Reporting from her vantage point with OERI, U.S. Department of Education, Sweet (1997) projected a "long-term agenda in which the commitment to build knowledge, the identification of promising approaches, and the provision of technical assistance to those responsible for educating our nation's youth are included" (p. 265). Noting that the research agenda cannot be contained as narrow categories, Sweet argued for the interconnectiveness of literacy and communication with the visual arts. She cited Arnheim's gestalt philosophy and Gardner's multiple intelligences as support for a multiliterate approach to learning which utilizes various symbol systems and fosters visual-spatial growth. She also described numerous intersections between academic knowing in content disciplines and cognitive strategies, along with conjunctions between school learning and motivation. Sweet cited affirmations in the

visual arts national standards: "The arts are a way of knowing...; the arts are indispensable to freedom of inquiry and expression; the modes of thinking and methods of the arts disciplines can be used to illuminate situations in other disciplines that require creative solutions; and the arts provide forms of nonverbal communication that can strengthen the presentation of ideas and emotions" (p. 277).

Boughton (1996), relying on expertise in national arts assessment practices based in Australia and European countries, articulated roles for summative assessment in the arts that include taking the national temperature, assessing opportunities to learn, informing professional development, and formative assessment intended to aid students in analyzing their own performances. Subsequent reviews of the 1997 NAEP arts assessment results observed that children's participation in the arts and depth of understanding continues to be associated with privilege (for example, Eisner, 1999). However, Stankiewicz (1999) posited that national assessments have a great potential to inform a variety of stakeholders. In particular, Stankiewicz maintained that the NAEP results could provide needed information and "represent art education to the public with integrity" (p. 30).

Context: The 1997 NAEP Arts Report Card

The *1997 NAEP Arts Report Card: Eighth-Grade Findings from the National Assessment of Academic Progress* (Persky, Sandene, & Askew, 1998) announced the completion of a unique assessment project. Shortly thereafter, grants were advertised for secondary study of arts achievement among eighth graders in combination with demographic, attitudinal, participatory, and contextual information. A nationally representative sample of 2,999 eighth-graders participated in the landmark study of visual arts achievement.[2] Samples derived from a complex, multi-stage process that considered gender, race/ethnicity, level of parental education, region of the country, and type of location. Approximately one-half of the participants indicated that they were taking or had taken art at school during the year. Intact classes (other than art classes) from public and private schools across the nation were selected and assigned to various test blocks. NAEP over-sampled nonpublic schools and schools with higher ratios of nonwhite to white populations. Sampling weights were then applied to adjust for disproportionate representation of reporting groups within the national sample.

The *NAEP 1997 Arts Report Card* highlighted positive associations for visual arts outcomes and in-school activity in art classes, opportunities to draw and paint, attending schools with designated rooms for arts classes, student portfolio development, opportunity to use art in other subjects, exhibiting art, museum and gallery attendance, talking about art with others, viewing art through a variety of media, and participation in out-of-school art activities. Primary analysts[3] also reported that students found in the upper level of the Responding scale more often had experience in making things with three-dimensional media than was found with students at the two lower levels. In addition, the primary researchers made oblique references to findings and variances that warranted the more complex statistical comparisons feasible in secondary analysis. Review of the report card and its various constellations of findings begged the question of a structural model, a figural representation of the data available for secondary investigation.

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[2]   The test blocks were unique in that constructed responses, along with a small number of objective questions, constituted the assessment block tasks.

[3]   The National Center for Educational Statistics (NCES) contracted with the Educational Testing Service (ETS) for scoring, data analysis, and reporting findings. Under a cooperative agreement, Westat, Inc. selected school and student samples and manages field operations. National Computer Systems (NCS) provided assessment materials and scores responses (The National Center for Educational Statistics, 1997).

The NAEP 1997 Arts Report Card illuminated several concerns in the field:

(1)   Was arts achievement related to taking art in 8th grade; and, how implicated were issues of teacher preparation, pedagogical decisions and practices in classrooms, collaborative activity with community arts agencies, student attitude, and student academic ability?

(2)   How important were family environment and home resources to arts learning?

(3)   What are the patterns of participation associated with art achievement, taking into consideration gender differences?

A related issue emerged concerning the concurrent development of national standards.[4] The standards articulation for arts areas coincided with the development of the National Assessment Education Project, both having been part of the package for inclusion among the Goals 2000 core of subjects. Respective committees, for national standards in the arts and national arts assessment, intended a smooth articulation of effort on both fronts (Arts Education Consensus Project Team, 1994).[5] Given that national standards were released between the pilot and full implementation of the NAEP arts assessment, the 1997 assessment established benchmark levels against which to measure subsequent infusion of standards and exemplary practices in arts education through student performance in American schools.[6] Stated another way, the 1997 assessment results provided a tentative, rather than a consistent, reflection of the standards in action. The arts assessments thus revealed the current fit of assessment to school practice along with gaps in student proficiencies. Diket, Burton, McCollister, and Sabol (2000) observed that the 1997 NAEP Art questionnaires and assessment tasks were by nature complex, crossing a number of identifiable constructs. The Arts Education Consensus Project Team (1994) incorporated a matrix of perspectives, affording multiple interpretation possibilities; as a secondary analysis team, we deemed it prudent to keep in mind the creation, expectations, and data foci of the assessment in postulating a model and developing our research design.

NAEP arts block tasks incorporated written responses and elicited artistic products, along with a number of objective items. Constructed materials were scored with rubrics and objective items coded within task blocks.[7] Two processes were examined as part of the visual arts assessment–Creating original art and Responding to art (by observation, articulation of perceptions and criteria for evaluation, and including responsive art making). Content emphases drew from semiotics, social science and art education by variously embracing world views of a personal, cultural, societal, and historical nature. Demonstrated perceptual, technical, expressive, and intellectual/reflective skills determined the overall rating of student

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[4]   Dennie Palmer-Wolf and Ruth Michell, consultants to the arts assessment project, articulated issues for national hearings in February of 1993. A major issue was the balance between existing practices in arts education and emerging standards for arts subjects at the core in GOALS 2000 (National Assessment Governing Board, 1994).

[5]   The National Assessment Governing Board (NAGB) sets policy for the NAEP and assigns subject areas for assessment. NAGB also develops guidelines for the reporting process. For the NAEP arts, NAGB worked with the Council of School Officers (CCSSO) which put together a consensus team including K-12 arts educators, university faculty, practicing artists, specialists in assessment (National Assessment Governing Board, 1994).

[6]   NAGB contracts with the American College Testing (ACT) to articulate subject standards for grade levels included in an assessment (The National Assessment Governing Board, 1997).

[7]   See National Assessment Governing Board, 1994; also Armstrong (1994) and Beattie (1997) provide excellent discussions of constructed tasks in arts assessment (Armstrong, 1994; Beattie, 1997).

performance, as "plausible values."[8] These indicators of arts achievement provided the base of our research model for secondary analysis (see Structural Model). The relevance of specific task components (such as visual organizers/ images and cognitive cues embedded in objective questions) to the path by which students constructed their responses and artistic products revealed a new sophistication in arts testing which we are currently investigating through the structural modeling of block tasks.

Technical issues, related to the creation of the NAEP data base, were discussed in the *Report Card* (Persky, Sandene, & Askew, 1998). For all types of questions and tasks in the reliability sample, exact agreement for scorers in the visual arts reached 86.2 percent. The Responding scale ranged from 0-300, with a mean of 150 and standard deviation of 35. Creating items were computed as "separate percent-of-total-possible points averages" (p. 186). Both computations were incorporated into the "plausible values."

Following from an extensive review of the *Report Card* and related literature, the grant team hypothesized that relationships might be observed for school culture, indicators of access to and student engagement with the arts (both in-school and out-of-school), and school emphases on art learning. The resource issue at the classroom level also warranted further investigation. Thus, the visual arts consortium assumed as its purpose a multi-faceted examination of factors related to arts achievement. We expected secondary findings to resonate with stakeholders (students, parents, and educators) and impact external support sources (legislative and policy groups, community and arts agencies). Grouping variables that could not be directly impacted by educational decisions (i.e., gender and race/ethnicity)[9] were subsumed in our examination until the final stages wherein these observations were used to further refine statements relating to policy.

Method/Confirmatory Factor Analysis

The secondary analysis began with specification of factor sets, selecting survey items subject to change within the educational system. Maximum likelihood extraction in SPSS was used to identify contributory clusters (sets of questionnaire items) associated with hypothesized constructs for NAEP data; the *NAEPEX* software (regression module)[10] provided summary tables, including the explanatory power of each cluster on plausible values associated with Responding and Creating in the visual arts.

Procedure for the Factor Analysis

First, correlation tables for potential variables were compiled and compared to each of five plausible values. Variables with the highest correlations were selected for entry into factor analysis according to hypothesized association with a construct on the model. The choice assumed that linear combinations of observed NAEP variables reflected hypothetical and practical constructs. A few "complex" variables were found to align with more than one construct, though single contribution is deemed preferable in analyses of this type. For instance, the survey item "watch TV or video about art"

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[8] "Proficiency values drawn at random from a conditional distribution of a NAEP respondent, given his or her response to cognitive exercises [block tasks] and a specified subset of background variables (conditioning variables). The selection of a plausible value is a form of imputation" (The National Center for Educational Statistics, 1997, p. 67)

[9] Gender and race are reporting groups in NAEP descriptive data on the web which are clearly discussed in the *Report Card*.

[10] Analyses carried out by toolkit modules produce results that are "reproducible and consistent with published summaries of the data" (Educational Testing Service, 2000, p. 6; *NAEPEX* software).

clusters with the factor "student seeks access to agency structured activity" (as producers and sponsors for programming in the arts) and also with the "home resources" factor (as media support for arts learning). Some factor sets were improved for interpretation by running varimax rotation.[11] Solutions were tested further using multiple regression (step procedure) to determine explained variance, identify significance levels, to check assumptions about variance and population, and to verify item contributions. A check for missing items concluded the early runs.

The goal of factor analysis involves making a number of justifiable decisions based upon model fit, data set, and research questions. To afford the most comprehensive inclusion of variables to be used later with achievement quartile and regional analyses and in cross-study comparisons, the analysis was standardized in the first phase of research using maximum likelihood with no forced rotations. Those variables that appeared "complex" revealed the interpretive advantage of a three- dimensional model–for example, "about how many books are in your home" suggested having or not having access to text resources and was also indicative of family interest in learning. Variables were then weighted, and analyses refined by verifying a "best" fit for each complex item. Variance explanations for factors improved in both explanatory strength and conceptual simplicity. Notably, only a few items dropped out of the model.

Variance Explanation for Model Constructs

We made the decision to use the existing coding in the restricted database, comparing patterns of response rather than intervals. The main advantage was that subjects did not drop out as "missing;" we deemed irregularities of student responses as evidence of misinterpretation, not following directions, carelessness, or of their not knowing an answer. We used student level weights (WEIGHT) with the factor analyses though an alternate approach might have used school level weights for the SQ variables answered by school representatives. Some of the factors were rotated using Varimax with Kaiser Normalization to clarify the matrix structure.

Demographic Data

Background indicators from NAEP visual arts questionnaires constitute the X face of the multidimensional model (refer to Figure 2). Three constructs[12] were statistically confirmed: **family** dynamics and provision of a learning environment; **student** attitude, academic ability and expectations; and **Region**/ District/School quantified elements (see summary sheet A, B, and C). Family indicators included a number of resources, all loading with parent education. We thus decided to represent the set as "home resources," though "family dynamics and provision of a learning environment" is equally serviceable. Analysis revealed 21 items loading for constructs for background characteristics on the demographic face of the model. In regression equations, family

Figure 2. X Face

learning environment/resources emerged as the strongest construct associated with the demographic face, explaining 25.2% of the variance on Responding and 23.8% of the variance on Creating.

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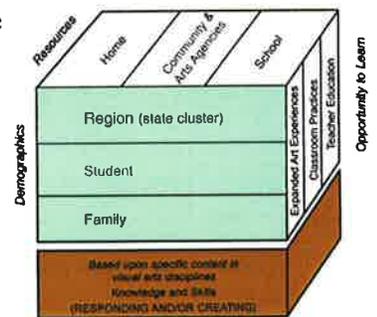
11   Varimax rotation employs the strategy of identifying factors that are *uncorrelated* (orthogonal) and is important in locating independent influences.

12   Construct is used in this paper to identify a grouping of factors. Factors are mathematical transformations of matrices of correlation coefficients. A factor thus is a primary phenomenon that requires explanation; a construct under the above definition alludes to but does not directly test a second order factor. At the bottom of the process are correlated items.

Student academic aptitude and expectations explained 20.5% of variance on Responding and 19.3% of Creating variance. Student attitudes accounted for 4.5% of Responding variance and 4.2% with Creating. Regional designation and characteristics explained 3.3% of variance on Responding and 1.3% of variance on Creating. Several geographic indicators were derived–district or state arts curricula, field trips, and urbanicity–that loaded well as principal components, though low in explanatory power for the regression model. Regional indicators were expected to be more relevant *in combination* with student reported variables and other school data.

<u>**Opportunity to Learn**</u>

The Y face (see Figure 3) contained three potential constructs: **classroom practices, teachers' education in art,** and **expanded art experiences** (see summary sheets D and E). One factor was extracted for classroom practice as a construct with 15 items loading. Classroom practices explained 9.9% of variance on Responding and 10.5% on Creating. Teachers' education, as coded in the data, was reserved as a background indicator to be recoded and used in combination with other variables. Most of the eighth grade teachers were specialists or part-time specialists, greatly reducing variability on teaching credentials. Specialists, moreover, may vary randomly in their preparatory study, teaching experience, and pedagogical decisions. Teacher education was retained in the model for its potential for explanation, as secondary systems will experience considerable turnover in teaching personnel in

Figure 3. Y Face

the next five years. The National Art Education Association (2001) reported that 58.2% of teachers in secondary schools plan to retire by 2010; 61% of secondary teachers in their survey reported being over 45 years old. Expanded art experiences did not factor as a stand alone, although seven items thought to be associated with the construct are found, clustering with resources and demographic indicators in the data set.
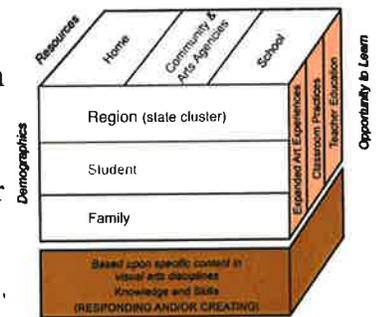
<u>**Resources**</u>

The Z face of the model (see Figure 4) was examined for **home, community and arts agencies,** and **school** characteristics/culture (see summary sheets F and G.1 and G.2). A meta factor was identified for home (described on the demographic face), along with a secondary factor specific to reading materials other than books. Art agencies yielded one factor for access, with the item indicating lack of access as a second factor (for a total of ten indicators). Arts agencies indicators explained 11.5% of the variance on Responding and 11.9% on Creating. School characteristics produced two factors, administrative statistics and a factor specific to the availability of art and music to 8th graders. Eleven items loaded on school characteristics, explaining 6.7% of variance on Responding and 6% on Creating . School culture, with fifteen items loading as stakeholder participation, explained 14.1% of variance with Responding and 12.6% for Creating.
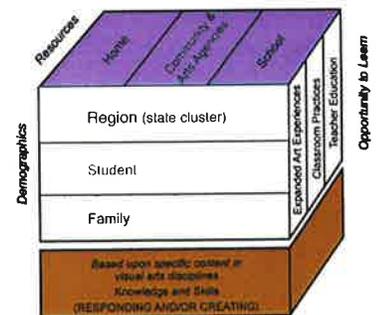
Figure 4. Z Face

Table 1.

Summary Regression Findings for Visual Arts, Using *NAEPEX*

Factors	R^2 Responding	R^2 Creating
Classroom Practice	9.9%	10.5%
Art Agencies	11.5%	11.9%
Home Resources	25.2%	23.8%
School Characteristics	6.7%	6.0%
School Culture	14.1%	12.6%
Student Attitudes	4.5%	4.2%
Student Aptitude	20.5%	19.3%

Probability for above equations = 0.

Combining the Factored Items to Test Theory

With items and variable sets identified in the factor analysis, the examination moved to more complex theoretical constructs. For example, the NAEP analysts had noted a possible "relationship between students' reported interest in an arts discipline and assessment performance" (Persky, Sandene, & Askew, 1998, p. 181). What might be learned through further study of the students' identity reported work habits, attitudes about art, and expectation of future opportunities?

Motivation to learn

Ford (1992) described three phenomena associated with motivation (shown in Table 2). Table 3 shows item clusters from the student general and visual arts background questionnaires that align as a complex factor for motivation. The ten indicators provide insight into the goals, emotions, beliefs, and actions of respondents. Factor items were loaded (using *NAEPEX* software) into a regression model; the cluster explained 22-23% of artistic achievement (see Tables 4-7), with much of the variance explanation stemming from academic indicators. Two indicators, "People tell me I am a good artist" and "I like to show my work to other people" suggested that a classroom social environment factor might be supporting motivated students (see Ryan & Patrick, 2001)

Table 2. Potential Indicators of Motivation

- the direction of behavior in present and future
- the energization of behavior
- the regulation of behavior

Table 3. NAEP Survey Items Associated with Student Motivation

Attitudes toward art	Academic Aptitudes and Expectations
• "I like to look at art" • "I like to do artwork" • "I think I have talent for art" • "People tell me I am a good artist" • "I like to show my work to other people"	• "How often do you discuss school study at home" • "How often do you use a computer at home" • "How many pages read a day for school and homework" • "Which best describes grades since 6th grade" • " How much education you expect to receive"

Table 4. Analysis of Variance – Student Attitude with Academic Aptitude and Responding Scores

ANOVA

Model		Sum of Squares	Mean Square	F ratio	df	Sig.
3	Due to model	995797610.40	11337807.59	686.75	10	0
	Error	3400906892.17		29.24		
	Total corrected	4396704502.57				

Model 3 Predictors: (Constant), Student Attitude (factor items), Student Aptitude and Expectations (factor items)

Table 5. Student Attitude and Aptitude as Predictors of Responding Scores

Model Summary

Model	R	R Square	Std. Error of Estimate
1	.211	.045	1184.4338
2	.453	.205	1080.2332
3	.476	.227	1066.6806

Model 1 Predictors: (Constant), Student Attitude (factor items)
Model 2 Predictors: (Constant), Student Academic Aptitude and Expectations (factor items)
Model 3 Predictors: (Constant), Student Attitude Factor, Student Aptitude and Expectations (factor items)
Unweighted N = 2,999

Hidi and Harackiewicz (2001) postulated that indicators of interest in a subject area, academic motivation in general, and goal setting depend upon both "personality and contextual factors" (p. 166). The developmental possibilities, particularly in middle grades, of art as an engaging situation needs to be explored further. Motivated students need interpersonal support and expanded engagement opportunities; less motivated students can reap benefits from engaging situations and varied opportunities to learn. The motivation level of students may require adjustment by individual of the level of optimal challenges within the situation.

Table 6. Analysis of Variance – Student Attitude with Academic Aptitude and Creating Scores

ANOVA

Model		Sum of Squares	Mean Square	F ratio	df	Sig.
3	Due to model	2806176360.20	4800315.94	365.14	10	0
	Error	10171869478.16		28.94		
	Total corrected	12978045838.36				

Model 3 Predictors: (Constant), Student Attitude Factor, Student Aptitude and Expectations (factor items)

Table 7. Student Attitude and Aptitude as Predictors of Creating Scores

Model Summary

Model	R	R Square	Std. Error of Estimate
1	.206	.042	2419.1261
2	.440	.193	2220.1637
3	.465	.216	2190.9623

Model 1 Predictors: (Constant), Student Attitude (factor items)
Model 2 Predictors: (Constant), Student Academic Aptitude and Expectations (factor items)
Model 3 Predictors: (Constant), Student Attitude Factor, Student Academic Aptitude and Expectations (factor items)
Unweighted N = 2,129

Breadth in Arts Participation

Ford (1992) contended, "It is only when concepts and propositions are embedded back into personalized and contextually anchored [behaviors] that they become infused with personal meaning and utility" (p. 29). The NAEP arts assessment attempted "to create a context for the assessment exercises" (Persky, Sandene, & Askew, 1998, p. 81). The exercises introduced the block/problem set with a narrative or visual example thought to be of interest to 8th graders, then guided students through related tasks designed to give additional information, and culminated in a "theme, concept, or work(s)" in art. Exercises included authentic tasks and constructed-response in combination with multiple-choice questions. The task blocks were not intended to "teach" students, rather to focus and to structure student responses during the assessment; moreover, the frame for the assessment actively tapped the body of knowledge and skills that students brought to the task blocks.

The assessment goal appeared twofold: (1) identify developed abilities in the visual arts as a subject area, and (2) establish baseline achievement for the visual arts by engaging artistic sensibilities and by fostering construction of artistic understanding through students' use of related

academic skills and knowledge bases.[13] Resnick (1989) posited that researchers have often looked for patterns and to awareness of social status without attending to the context of interactions. The occasion of the arts testing provided many students with compelling tasks that illuminated student predisposition to the arts. Perceiving oneself as an artist, demonstrating academic competence, and expecting to continue one's education strongly indicated internal predispositions to art and other academic subject areas. Additionally, Resnick pointed to the need for more attention to motivational patterns *evidenced* by task success and engagement. Finally, educators need to understand the mechanisms by which *intentional learning*, under the active control of the learner, require a "social negotiation in which both parties...try to establish what the other knows" (p. 10).

The "portability" or transfer of learning may rely on participation in microcultures, in the school art class, in family, and in the community. About half of the students reported that they were currently enrolled in art class or had taken art at school during the past year. The *Report Card* indicated that the isolated variable "taking art class" was positively related to creative achievement. Significant findings were also reported for students taking visual arts at school, achieving in the upper level of the Responding scale in comparison to those in the lower level. Some school art experiences were found to vary extensively. Moreover, participants reported attitudes favoring and participation in a number of extra-school art activities, including making art and study of art at home (Table 3 and 4) and engaging in visual arts programming and activities with agencies outside school. Hypothesizing that broad student participation in artistic activities at school and in settings outside of school correlates with art achievement, an analysis was designed with recoded participation indicators. This approach was similar to compilation of the "amount and context of arts instruction" reported by Burton, Horowitz, and Abeles (2000). Affirmative responses to twelve not-for-school items were recoded (0 = no and 1 = yes) and counted (sumBV).

Table 8. Participation Indicators

Not-for-School/BV00022-32

• Watch TV/video about art*	• Enter an art competition
• Talk to family/friends on art*	• Go to summer art program
• Go to art museum or exhibit*	• Look at or read book on art*
• Take art classes	• Visit an artist's studio
• Make artwork*	• Keep an art journal or sketchbook*
• Exhibit your artwork	

BV80022

*student on own, without agency support

Means for gender and race (unweighted), shown below in Tables 9 And 10, were computed, indicating quite different patterns of extra school engagement for males and females and less dramatic variations in mean participation with racial/ethnic identifiers. With race/ethnicity the

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[13] Engaging artistic propensities suggests conveying information from one's "position" in the arts to a related context—i.e., the national assessment; in contrast, fostering construction of artistic understanding suggests using knowledge (on assessment tasks) that is derived from general social circumstances or core understandings. In the first perspective the focus is on the individual; the second perspective prioritizes the "social collective". Both perspectives can potentially contribute to stakeholders understanding how the visual arts functions in isolation and within the core (see Cobb & Bowers, 1999, for an in-depth discussion of cognitive and situated learning perspectives in education).

greatest variation was located in ratios of actual to expected counts at the zero participation level of sumBV. A previous test of engagement patterns by gender, isolating the upper quartile on the plausible values, indicated that gender related variations in engagement may lead to similar performance outcomes. Based on their reports we can postulate that males sought depth of involvement and females attempted breadth. See Diket and Thorpe (this publication) to see how we continued examination of the gender grouping variable in development of a Hierarchical Linear Model for visual arts achievement.

Table 9. Means Participation (sumBV) and Standard Deviations by DRACE/unweighted

Race/Ethnicity	Mean	N	Std. Deviation
White	2.94	1907	2.44
Black	2.88	407	2.48
Hispanic	3.03	488	2.63
Asian	2.84	113	2.47
Pacific Islander	2.59	29	1.99
American Indian	3.60	45	2.56
Unclassified	2.70	10	2.21
Total	2.95	2999	2.47

Table 10. Means Participation (sumBV) and Standard Deviations by SEX/unweighted

Gender	Mean	N	Std. Deviation
Male	2.77	1503	2.48
Female	3.13	1496	2.46
Total	2.95	2999	2.47

Extra school participation variables were entered into a series of exploratory regression models, using *NAEPEX* software. Grouping variables for gender and race were included in the exploration at this juncture in order to examine R square for change. Race/ethnicity and sex, significant indicators in regression on student achievement, explained 10% of variance on Responding and 8% of the variance found with Creating. Adding sumBV in the model increased variance explanation to 11% on Responding and 9% on Creating. A model with sumBVown (unstructured participation) provided approximately the same variance explanation as was found with sumBV. A third model, with taking art class (BV07–recoded 0/no or 1/yes) and recoded *individual* participation indicators, plus grouping variables DSEX, and DRACE[14] (race/ethnic background), explained 20% of variance on Responding and 19% on Creating. See tables below. Though summing participation indicators

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[14]   DRACE, combining race and ethnicity information, appeared to be a stronger variable choice than the "observed" race of student. Number counts on the two variables differ somewhat. For example, 2006 students were coded WHITE under RACE and 1907 students coded WHITE in DRACE variable. The culture with which the student identified his or herself was deemed to have greater import than "observed" race.

generated less variance explanation in multiple regression equations, the conceptual simplicity of summed participation may prove useful in future work with two-level hierarchical models.

Table 11. Analysis of Variance –
Taking Art Class, Participation Rate, Race/Ethnicity and Gender on Responding Scores

ANOVA

Model	Sum of Squares	Mean Square	F ratio	df	Sig.
Due to model	883389373.20	1176989.99	654.47	14	0
Error	3513315129.37		30.45		
Total corrected	4396704502.57				

Model 3 Predictors: (Constant), BV07, BV 22-32, DRACE, DSEX

Table 12. Analysis of Variance –
Taking Art Class, Participation Rate, Race/Ethnicity and Gender on Creating Scores

ANOVA

Model	Sum of Squares	Mean Square	F ratio	df	Sig.
Due to model	2456241603.73	4974848.34	783.55	14	0
Error	10521804234.63		32.49		
Total corrected	12978045838.36				

Model 3 Predictors: (Constant), BV07, BV 22-32, DRACE, DSEX

Importance of Parental Dynamics

NAEP questionnaires provided two sources of information about parent dynamics–student level reports of "talk with family and friends about art, (BV00030)" and school level estimation of school level for "parents who participate in PTO," "open house," "teacher conferences," "curriculum decisions" and "volunteer programs." Perusal of NAEP national visual arts results data almanac for grade 8 school data on the web (http://nces.ed.gov/nationsreportcard/tables/art1997/) indicated the viability of schools' open house activity and parent teacher conference as a bridge to families. Exploratory regression equations run with NAEPEX software included BV00030, the two SQ parent participation variables for open house and teacher conference, and DRACE; models explained 11% of variance on art achievement, *SE* of estimate 1144.66 for Responding and 2341.59 with Creating (see Tables 13 and 14). We reserved Parent Education (PARED), a NAEP grouping variable, as an oblique indicator for family dynamics.

**Table 13. Analysis of Variance –
Parental Interest Demonstrated on Responding Scores**

ANOVA

Model	Sum of Squares	Mean Square	F ratio	df	Sig.
Due to model	472498220.31	1310252.51	164.83	1	0
Error	3924206282.26		33.76		
Total corrected	4396704502.57				

Model 3 Predictors: (Constant), BV00030, DRACE, SQ00107, SQ00108

**Table 14. Analysis of Variance –
Parental Interest Demonstrated on Creating Scores**

ANOVA

Model	Sum of Squares	Mean Square	F ratio	df	Sig.
Due to model	1326559132.17	5483052.57	147.39	4	0
Error	11651486706.19		29.85		
Total corrected	12978045838.36				

Model 3 Predictors: (Constant), BV00030, DRACE, SQ00107, SQ00108

Discussion

Factor analysis and regression models developed from NAEP assessment in the visual arts revealed the rich array of information contained in the 1997 assessment data. Our expectations for the research model were borne out in statistical modeling of theoretical and practical perspectives that had been woven into the assessment from vision, to frame, in pilot investigations, and full implementation. As Sullivan (1986) observed, in a study of symbolic functioning in art, empirical methods of analysis rely on defining concepts in forms suitable for statistical examinations. An exploratory HLM, with a beta version of visual arts restricted data, demonstrated the theoretical plausibility of testing constructs embedded in NAEP questions, and helped advance some intriguing directions for continued analysis of visual arts education at the classroom level, within schools, that are supported by activities provided by community agencies (Diket, 2001).

Learning in the school art class, combined with out of school learning, likely constitutes a community of practice which affords students partial views of self, insight into contemporary life, and a more interpretive screen of group membership and possible roles (Heath, 2001). Evidence is growing that arts and humanities-based "culture counts" and may help "deter risky behaviors" (Weitz, 1996, p. 15) by enabling new perspectives, building self worth, providing youth with marketable job skills, and contextualizing interpersonal relationships with their peers and adults. The 1997 NAEP provided strong indicators in some of these very areas.

Community agencies offer unique resources, a range of activities, structure, cross-age involvement, and cross-disciplinary experiences. It should be noted, that changes in time and place may help to sustain learning, in-school to after-school. Often after-school activities provide "down time" prior to formal activity, recognizing that students do need to relax, socialize, and speculate about the importance of participation. NAEP data, along with recent surveys of teacher practice, suggested that teachers may be volunteering with community arts providers or actively seeking resources in out-of-school settings, thus bringing "extra education" advantages into art classrooms.

Parents are stakeholders and contributors in arts education; the availability of resources to family members and parental involvement with their children at home and at school explains far too much of variance in arts achievement. Feuerstein (2000) found that several forms of parental involvement, notably PTO attendance and volunteerism, increased when teachers contacted parents. Advocates for positive change might want to use NAEP type questions to develop knowledge of school-level characteristics, to consider issues of first language, cultural values, family dynamics, dominant cliques and staff attitudes as they design for better schools (Pena, 2000).

The consortium secondary study of the NAEP suggested that artistic learning grows within a complex of influences. Investigations with the visual arts data has begun to show how these influences can be identified, clustered, and quantitatively investigated within a field. Berleant (1991) argues, in *Art and Engagement*, that experiences of art take place in situations, under various social conditions. Bound to the circumstances within which art is experienced, artistic responses exhibit the "active interplay of the factors involved: perceptual, material, environmental, formative, and performative forces that contribute to the dynamic unity of experience" (pp. 3-4).

Motivation theory, a complex of intrinsic and extrinsic factors, must be accorded its place among potential guides for the field. Proponents of arts education need to further investigate learning situations that initiate and sustain student interest, as situations correlated with students' internalized commitments to the arts and academics. Ultimately, the visual arts ought to resonate with all students, enabling engagement with artistic learning which will be sustained over time and task.

Recommendations

- **Build partnerships and networks among schools and community and arts agencies.** Articulate learning goals within the wider community and build support for arts education through teacher contact; foster mentor opportunities for students, structure arts activities outside of school, use outside resources in school; and recognize the achievements of students in art programming both inside and outside of school.

- **Articulate, assess, and work proactively to eliminate problems in school.** The NAEP school questionnaire contains excellent questions that could be incorporated into school based surveys of parents and students. Formal and informal surveys of student use of tobacco, alcohol, drugs, and problems with gang, physical conflict at school, social/cultural conflicts, misbehavior in class, cheating, absenteeism, tardiness, health, and lack of involvement in school provide a baseline from which to document progress. The community should be advised of findings and brought into problem solutions. Strong arts programming in schools and community and arts agencies provides positive outlets for all students. Research reports document impressive successes with "at risk" students.

- **Determine curricula foci, select resources, and align educational settings so as to provide a rich base of support for students**. Districts and schools should develop curricula expectations based upon local needs and update curriculum plans frequently, incorporating relevant research and policy directions. Situations engage students in their learning, from engagement students become motivated to seek additional educational opportunities in art and a good many begin to define themselves in an artistic sense. When students are already motivated in the arts, continued learning opportunities provide necessary context for sustained learning and further refinement of artistic sensibilities and capabilities.

- **Provide in-service opportunities and continue resources for teachers to support professional development**. Published surveys by the government and the National Art Education Association indicate that many art teachers anticipate retiring in the next decade. Changes in philosophy, new materials and resources, growing diversity among student populations, and social issues impact classroom practices. Both seasoned and novice teachers need to keep up-to-date on research findings and recognize good practice exemplars. Teachers, as the primary student contact, ought to initiate and be encouraged to find information on their own about subject specialties and general education venues. In the visual arts, the National Art Education Association publishes extensively; subject area materials and policy initiatives can be viewed and accessed through its website (http://www.naea-reston.org). National museums provide teacher resources (for example, the National Gallery of Art in Washington at http://www.nga.gov/resources/resource.htm). The Morrison Institute for Public Policy with support from National Endowment for the Arts (http://arts.endow.gov) published *Schools, Communities, and the Arts: A Research Compendium* in 1995 (http://www.asu/copp/morrison;contact.htm). The National Center for Educational Statistics lists extensive materials for educational professionals in its homepage http://nces.ed.gov/pubsearch/index.asp (for example, *What Happens in Classrooms? Instructional Practices in Elementary and Secondary Schools*, one of the "fast response surveys," examines teacher and student roles, classroom use of materials and technology, classroom assessment of learning, and instructional strategies).

- **Promote parent volunteerism opportunities in schools and community agencies to educate parents about the arts**. Educational agencies can tailor initiatives and opportunities for involvement with parents in the community that consider and value ethnic and cultural diversity. Though the tendency is to try to teach students directly in educational settings, home environments are crucial in the learning triad of influence. For parents who lack extensive educational experiences with arts and other core academics, learning with their children gives context to parent and child discussions in the home and opens new vistas for life-long learning. For example, parents can assist in class and community based projects, go on field trips, and help stage art exhibitions and plays.

- **Support the 2007 NAEP Arts by offering school sites**. NAEP schools must elect into the assessment. The viability of the NAEP arts data set has been demonstrated in the *Report Card* and through secondary analysis of visual arts data. Longitudinal data on student achievement in the arts and concurrent patterns indicated by student, teacher (proposing an addition to NAEP visual arts respondents), and school surveys would provide stakeholders with important information about the infusion of national standards in the arts, variation in

teacher preparation and pedagogical attitudes, illuminate students personal and social understandings, and document transfer of operational and informational resources by students in the tested subject areas. Trends in art could be examined as a component in the core of understandings sought for America's children. Continuation of NAEP testing depends upon the support of all stakeholders–students, parents, educators, community and arts agency providers, and legislators at all levels. The eighth grade information in the visual arts proved invaluable, and longitudinal information is needed for eighth grade. Even better would be a national arts assessment at 4th, 8th, and 12th grades, to afford cross-sectional comparisons.

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Summary Sheet A.
Family, Dynamics & Provision of a Learning Environment/Home Resources

Code	Content	Coding Direction*
PARED	Parent's education, derived from 2 background	(+)
B000007	Does your family get a newspaper	(-)
B000008	Is there an encyclopedia in your home	(-)
B000009	About how many books in your home	(+)
B000010	Does your family get magazines regularly	(-)
B000011	How much TV do you usually watch per day	(+)
BV00029	Not for school: watch TV/video about art	(-)
BV00030	Not for school: talk to family/friends on art	(-)

Expected sign in relation to plausible values
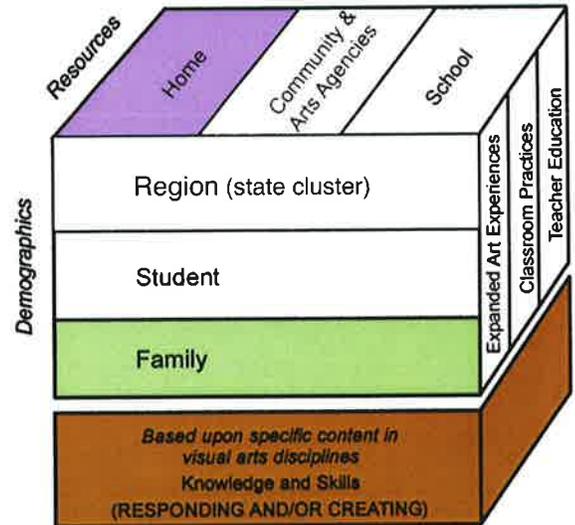
Results:

Variance Explanation with Maximum Likelihood = 53.22%; rotation using Varimax with Kaiser Normalization improved interpretability.

Rotated Factor Matrix

	Factor	
	1	2
B000009W	.887	
PAREDWT	.788	
BV00030W	.600	
BV00029W	.593	
B000011W	.555	.449
B000010W		.691
B000007W		.626
B000008W		.617

Notes: Items were multiplied by WEIGHT (across sample adjusted student weight) and introduced into the factor analysis using SPSS 10.

Rotation converged in 3 iterations.

Summary Sheet B
Student Attitudes and Aptitudes

Attitudes

Code	Content	Coding Direction*
BV00001	I like to look at art	(-)
BV00002	I like to do artwork	(-)
BV00003	I think I have a talent for art	(-)
BV00004	People tell me I am a good artist	(-)
BV00005	I like to show my artwork to other people	(-)

Aptitudes

Code	Content	Coding Direction*
B000018	How often do you discuss school study at home	(-)
B000019	How often do you use home computer for school	(-)
B000020	How many pages do you read a day for school & homework	(-)
B000021	Which best describes your grades since 6th grade	(-)
B000022	How much education do you expect to receive	(+)

Expected sign in relation to plausible values
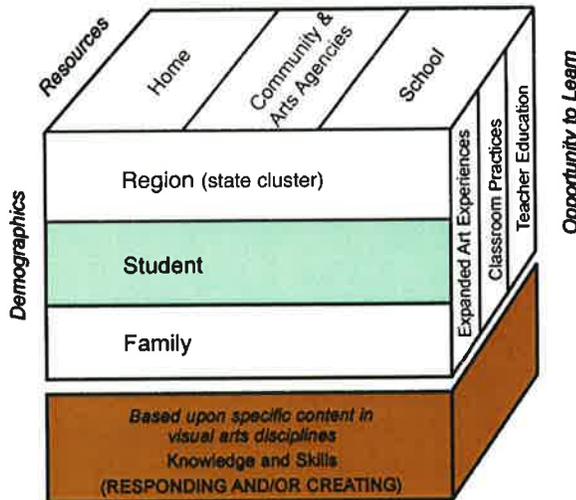
Results:

Variance Explanation with Maximum Likelihood = 75.79% on Attitude.

Variance Explanation with Maximum Likelihood = 69.77% on Aptitude and Expectations.

Factor Matrix for Attitude

	Factor 1
BV00001W	.827
BV00002W	.855
BV00003W	.925
BV00004W	.906
BV00005W	.836

Factor Matrix for Aptitude

	Factor 1
B000021W	.869
B000019W	.852
B000022W	.841
B000018W	.812
B000020W	.800

Notes: Items were multiplied by WEIGHT (across sample adjusted student weight) and introduced into the factor analysis using SPSS 10.

Both required five iterations.

Summary Sheet C.
Region (state cluster)

Code	Content	Coding Direction*
Code	**Content**	**Coding Direction***

URBAN   Urbanicity (QED) (dummy code; urban<rural)

SQ00021   District or state visual arts curriculum (n=1794)

SQ00026   In last year, 8th grade visual arts field trips (n=1068)

NAEPRGN   Region (dummy coded; east<west)

*To be used as background characteristics/derived Principal Components Analysis (SQ questions code for yes=1)
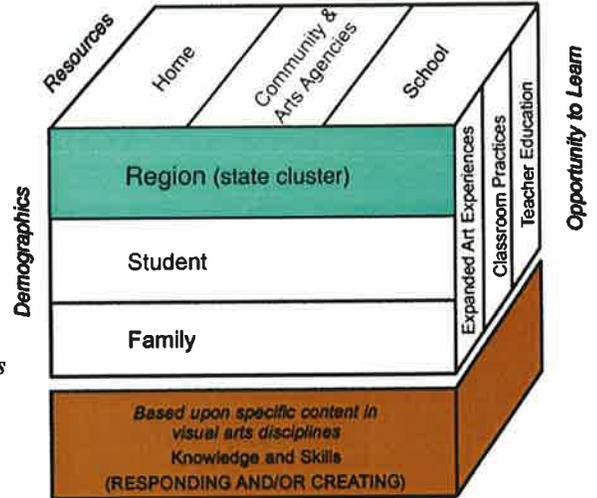
Results:

Variance Explanation with Maximum Likelihood = 29.37%; Also run as Principal Component Analysis which explained 46.83% of variance.

Factor Matrix

	Factor
	1
URBANW	.582
SQ00026W	.575
SQ00021W	.550
NAEPRGNW	.450

Four iterations required.

Component Matrix

	Factor
	1
URBANW	.718
SQ00026W	.701
SQ00021W	.693
NAEPRGNW	.620

Notes: Items were multiplied by WEIGHT (across sample adjusted student weight) and introduced into the factor analysis using SPSS 10.

Summary Sheet D.
Classroom Practices

Code	Content	Coding Direction*
BV00008	Art Class: Paint or draw	(-)
BV00009	Art Class: Make things of clay/other material	(-)
BV00010	Art Class: choose your own art project	(-)
BV00011	Art Class: Work in pair or in a group	(-)
BV00012	Art class: Talk with others about your artwork	(-)
BV00013	Art Class: Write about your artwork	(-)
BV00014	Art Class: Videos, films, slides, TV about art	(-)
BV00015	Art Class: Use camera, computers, xerox in art	(-)
BV00016	Art Class: How often does teacher exhibit artwork	(-)
BV00017	Ever illustrate artwork in other school subjects	(-)
BV00018	Do you keep art journal/sketchbook for school	(-)
BV00019	Do you/your teacher save your artwork, portfolio	(-)
BV00020	How often homework for art class	(-)
BV00021	In last year, class visit art museum/gallery	(+)

Expected sign in relation to plausible values
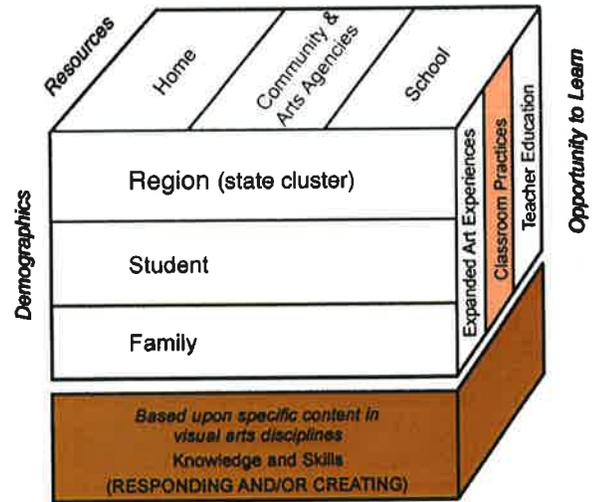
Results:

Variance Explanation with Maximum Likelihood = 69.05%.

Factor Matrix

	Factor 1
BV00008W	.796
BV00009W	.906
BV00010W	.822
BV00011W	.896
BV00012W	.844
BV00013W	.902
BV00014W	.905
BV00015W	.851
BV00016W	.825
BV00017W	.663
BV00018W	.861
BV00019W	.803
BV00020W	.885
BV00021W	.613

Notes: Items were multiplied by WEIGHT (across sample adjusted student weight) and introduced into the factor analysis using SPSS 10.

Five iterations required.

Summary Sheet F.
Community and Arts Agencies

Code	Content	Coding Direction*
BV00022	Not for School: Go to art museum or exhibit	(-)
BV00023	Not for School: Take art classes	(-)
BV00024	Not for School: Make artwork	(-)
BV00025	Not for School: Exhibit your artwork	(-)
BV00026	Not for School: Enter an art competition	(-)
BV00027	Not for School: Go to summer art program	(-)
BV00028	Not for School: Look at or read book on art	(-)
BV00031	Not for School: Visit an artist's studio	(-)
BV00032	Not for School: Keep art journal or sketchbook	(-)
BV00033	Not for School: NONE OF THE ABOVE	(-)

*Expected sign in relation to plausible values
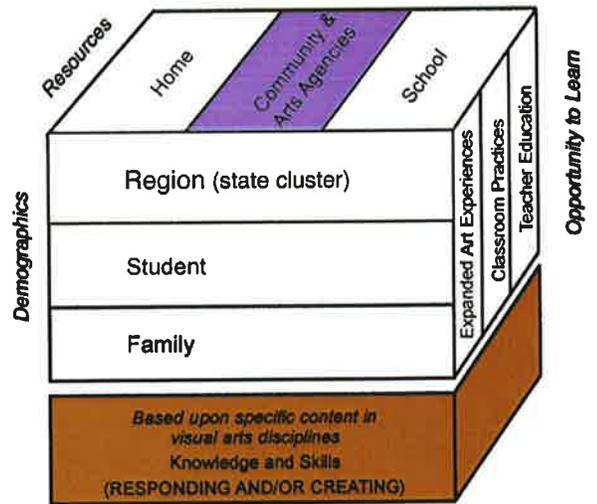
Results:

Variance Explanation with Maximum Likelihood = 72.94%; rotation using Varimax with Kaiser Normalization improved interpretability.

Rotated Factor Matrix

	Factor	
	1	2
BV00024W	.806	
BV00025W	.788	
BV00026W	.788	
BV00032W	.775	
BV00031W	.775	
BV00027W	.774	
BV00023W	.763	
BV00028W	.750	
BV00022W	.729	
BV00033W		.873

Notes: Items were multiplied by WEIGHT (across sample adjusted student weight) and introduced into the factor analysis using SPSS 10.

Rotation converged in three iterations.

Summary Sheet G.1.
School

Characteristics

Code	Content	Coding Direction*
NTEACHC	Number of teachers (QED)	(+ = more faculty)
GRSPAN	Grade span code (QED)	(dummy coded)
ENROLL	Student enrollment code (QED)	(dummy coded)
IDP	Instructional dollars per pupil (QED)	(+)
SQ00005	8th graders receive instruction in dance	(-)
SQ00006	8th graders receive instruction in music	(-)
SQ00007	8th graders receive instruction in theatre	(-)
SQ00008	8th graders receive instruction in visual arts	(-)
SQ00072	Describes space for teaching visual arts	(dummy coded)
SQ00124	Characterize moral of teachers	(-)
SQ00125	Characterize students' attitudes on academic achievement	(-)
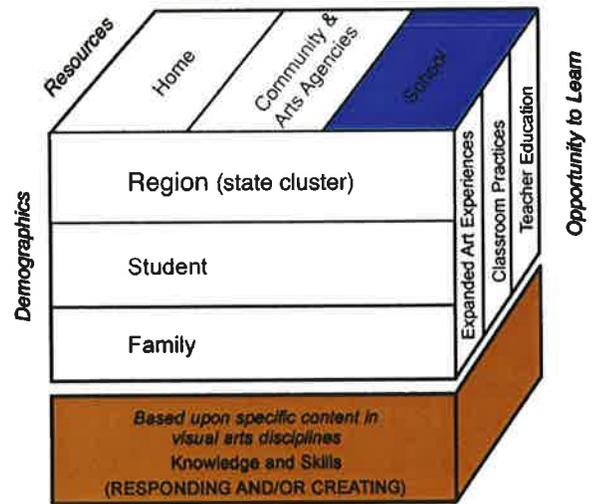
Expected sign in relation to plausible values

Results:

Variance Explained by Maximum Likelihood = 56.72%; rotation using Varimax with Kaiser Normalization improved interpretability.

Rotated Factor Matrix

	Factor	
	1	2
NTEACHCW	.944	
ENROLLW	.938	
GRSPANW	.638	.424
IDPW	.624	
SQ00125W	.450	.426
SQ00124W	.334	.330
SQ00007W	.496	.745
SQ00005W	.564	.733
SQ00006W		.609
SQ00008W		.564
SQ00072W	.379	.509

Notes: Items were multiplied by WEIGHT (across sample adjusted student weight) and introduced into the factor analysis using SPSS 10.

Rotation converged in three iterations.

Summary Sheet G.2.
School

Culture

Code	Content	Coding Direction*
SQ00107	Parents who participate in open house	(+)
SQ00108	Parents who participate in teacher conferences	(+)
SQ00111	What degree student absenteeism a problem	(+)
SQ00112	What degree student tardiness a problem	(+)
SQ00113	What degree physical conflict-children a problem	(+)
SQ00114	What degree teacher absenteeism a problem	(+)
SQ00115	What degree social/cultural conflicts problem	(+)
SQ00116	What degree student health a problem	(+)
SQ00117	What degree lack student involvement problem	(+)
SQ00118	What degree student alcohol a problem	(+)
SQ00119	What degree student use tobacco a problem	(+)
SQ00120	What degree student use drugs a problem	(+)
SQ00121	What degree gang activity a problem	(+)
SQ00122	What degree student misbehavior class problem	(+)
SQ00123	What degree cheating a problem	(+)

Expected sign in relation to plausible values
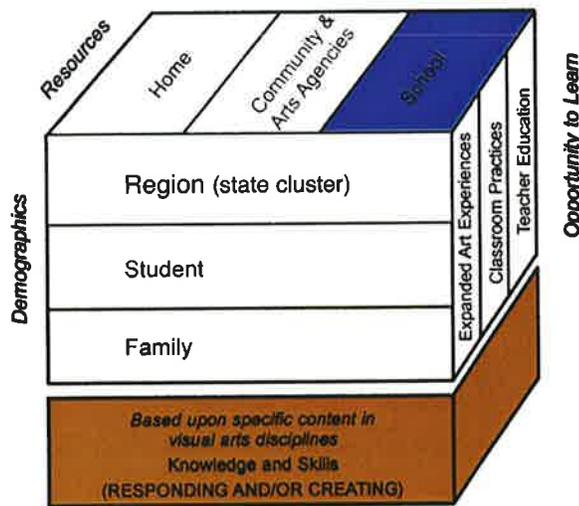
Factor Matrix

	Factor 1
SQ00107W	.746
SQ00108W	.830
SQ00112W	.889
SQ00114W	.926
SQ00115W	.905
SQ00116W	.907
SQ00119W	.890
SQ00120W	.839
SQ00123W	.922
SQ00122W	.884
SQ00121W	.925
SQ00117W	.883
FQ00111W	.832
SQ00113W	.883

Results:

Variance Explained by Maximum Likelihood = 77.68%.

Notes: Items were multiplied by WEIGHT (across sample adjusted student weight) and introduced into the factor analysis using SPSS 10.

Seven iterations required.

Explaining Within Group Variation in Visual Art Achievement for Students Taking and Not Taking Art

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Acknowledgements

Explaining Within and Between Group Variation in Visual Arts Achievement for Students Taking and Not Taking Art

Read M. Diket and Pamela K. Thorpe*

Visual arts learning reaches many students, engaging most of the intelligences described by Gardner (1983) with visual images, kinetic involvement, mathematical logic, interpersonal communication, intrapersonal awareness, and verbal means. Achievement in the visual arts reflects the general knowledge and skills of a core of subject areas; however, to achieve at the upper level of the NAEP assessment students need specific understandings of cultural practices, techniques, histories, and values particular to the visual arts. Thus, general academic aptitude and positive work habits would explain at least a portion of students' variation in visual arts performance (about 20% in regression equations). However, some 80% of variance eluded explanation with an academic aptitude model.

Within the 1997 NAEP Arts subjects, the visual arts participants were unique in that only 48% of students were taking art at school within a year of the assessment, though 52% of students attended schools where the visual arts were taught (Persky, Sandene, & Askew, 1999). While other arts assessments tested only students currently taking the subject, the visual arts presented two conditions, taking art or not taking art during the period of the assessment. No information was in the data about students' study of visual art in elementary school. The *Report Card* summaries revealed that students in the upper ranges of visual arts performance were more likely to be taking art at school. A positive relationship was identified for students' average Creating score and taking art in the assessment year. A significantly larger percentage of students who were taking visual arts were found in the upper level of the Responding scale than at the lower level. Given report card findings, we selected taking or not taking art as the identification indicator for our HLM model, in order to maximize variance in the equation.

The factor structure of NAEP data provided predictors for the HLM model. We used the research model to think through scenarios in which students could have developed proficiency in the visual arts. Throughout the various investigations contained in this report, the consortium's structural model had focused investigators' thinking, enabling the factor analyses and regression tests in specific areas. Would the structure function well in nested examination of data?

Context for the Analysis: Art at School

We considered the likely thrust of visual arts course work in schools in 1997, and pondered the impact of general trends in student performance when designing the HLM model. For example, Burton (1999), using random sampling techniques, conducted a survey of secondary art educators (N = 177) about the state of art education instructional practices in U.S. Schools. He reported (two years after the 1997 NAEP arts assessment) that 80-90% of teachers favored "one-to-one conversation, demonstration, and exploration of media and techniques" (p. 1) and rarely used computers in the classroom. Teachers in the Burton sample ranked formal curricula considerably lower than personal experience and personal reading. The clear favorite for motivating students centered on media and process, with 76% of teachers finding studio a very effective strategy. Teachers reported using oral checks for comprehension, along with brain storming and mind mapping. Burton observed that respondents relied more upon directive questioning strategies than interactive ones. Assessment was based on direct observation and individual conversations with students; though over 50% of the teachers also used porfolio review, rubrics, and self-evaluation. Though the newly released visual arts standards (NAEA, 1996) were being infused into state and district curricula, the 1997 NAEP Arts data indicated as did Burton's findings that many middle school teachers

were still working with media limited versions of the studio model. With these insights, we developed an "art as experience" mean score.

Sabol, Kozlowski, Munoz, & Phillips (1999) conducted a needs assessment project with urban teachers in the Western region. The authors identified a number of school level problems that negatively influenced urban art education, notably truancy, absenteeism, student turnover, gangs and violence, substance abuse, and lack of public support. We identified a school climate factor among NAEP items which contained most of the same problem indicators, and used it at Level 2 of the HLM.

Venet (1999) surveyed teachers' choices of art historical content in Missouri. She found that selections of "artists/cultures/themes" expanded as the grade levels increased. Fewer than 60% of teachers selected minority artists or non-western cultures as a focus. Venet's survey affirmed the NAEP task choices. Respondents prioritized the expression of ideas, narrating or telling a story, the expression of emotion, organization of the elements of art, advertising, designing built environments, influencing values, functioning in society, and other ideas contained in the 1997 NAEP visual arts tasks. As secondary analysts, we could feel very confident of the strength of NAEP plausible values as they were based in tasks similar to those reported by teachers in the field.

In this period of subject area transition for the arts and other core subjects, we envisioned a more diffused pantheon of influences operating in support of student achievement on the NAEP visual arts tasks. We checked national trends in average scale scores on the NAEP, reported for 1996 (Campbell, Voelkl, & Donahue, 1997). At the time of the assessment, few indications of positive trends in writing were noted, although reading showed modest improvement. Eighth grade writing jumped upwards in 1992 and regressed to a slightly elevated level in the year prior to the arts assessment. Thirteen year olds were showing modest improvements in science and math. Gender differences were noted, especially that female students outperformed male students in reading and writing. More students were using computers at home; and eighth graders reported that they were reading more pages for homework assignments. Changes in school use of computers for writing were profound, from 15% in 1978 to 91% in 1996 for grade eight. Earlier versions of the HLM reported here treated technology indicators which did predict achievement. We also looked at exemplary practices (portfolio, journal and sketchbooks, and make art for other classes). These variables did not predict variance for either group. The *Report Card* indicated that exemplary practices were widely used in middle school art classes and thus did not vary within groups. Exemplary practices were usually present for those taking art at school and totally absent when students did not take art.

From the web of insights, we scripted the HLM model. The process included double-checking the theoretical and practical thinking informing choices—casting through numerous possibilities—using subject area expertise, statistical insights from previous analyses, and projecting from art teaching experience.

Explaining variance as a directionality of influences associated with achievement in the visual arts was first explored using step procedures (see Diket, this publication, for examples with motivation to learn and arts experience). Modeling hierarchy as stepwise premised change in variance explanation (R^2) as a hierarchy builds and provided a first step to investigating nested factors. Regression was viewed as a special case of the hierarchical linear model (Bryk & Raudenbush, 1992).

Findings

The multilevel regression model appears in the research literature under a variety of names, i.e. random coefficient model, hierarchical linear model. A multilevel regression model assumes there is a hierarchical data set, with one single dependent variable that is measured at the lowest level and

explanatory variables at all existing levels. Conceptually the multilevel regression model can be viewed as a hierarchical system of regression equations. In this discussion, we consider explanations for variation in eighth-grade visual arts achievement as measured by five plausible scores for each student. It is our belief that variations in students' experiences in the visual arts and in the use of homework in the visual arts are critical in understanding the variability found between eighth-grade students in visual arts achievement. In addition, our previous findings suggest that gender, academic aptitude, and academic attitude also explain visual arts achievement. Furthermore, we believe that school culture explains the variation we see in students' attitude toward academics. We used HLM (Bryk, & Raudenbush, 1992) 5.04 to analyze the 1997 NAEP Eighth-Grade Visual Arts Achievement data in the current study. Currently taking or not taking an art class was used as the grouping variable. The relationship between visual arts achievement and our variables of interest are summarized in what is termed as unconditional and conditional models. The unconditional model is tested first.

Level-1 Model

$$Y = \beta_0 + \beta_1 (Acadapt) + \beta_2 (Acadatt) + \beta_3 (Experience) + \beta_4 (Homework) + \beta_5 (Gender) + R$$

Level-2 Model

$$\beta_0 = \gamma_{00} + \mu_0$$
$$\beta_1 = \gamma_{10} + \mu_1$$
$$\beta_2 = \gamma_{20} + \mu_2$$
$$\beta_3 = \gamma_{30} + \mu_3$$
$$\beta_4 = \gamma g_{40} + \mu_4$$
$$\beta_5 = \gamma_{50} + \mu_5$$

The level 1 and level-2 models constitute what is called the unconditional model with no level 2 predictors. It is used to determine how well the variables in Level 1 predict visual arts achievement and whether there is significant variability between students who currently take art and those who are not currently taking art class for the variables in Level 1. We believed that gender, Academic Aptitude and Academic Attitude (see Diket, this publication) and Art Experiences and Homework explained variation in visual arts achievement during the 1997 assessment. We also expected that significant variability between the two groups of students would be found in Academic Aptitude, Academic Attitude towards the Visual Arts, Art Experiences and Homework. This variability would then be analyzed in a conditional model containing Level 2 predictors.

The Art Experiences variable was constructed from the following items: writing about their artwork, choosing their own art project, talking with others about their artwork, working in pairs or groups, and painting or drawing. The group constituted basic experiences thought to vary among tested students. A Likert scale was used for these items with the following categories: every day, once a week, once a month, and never or hardly ever. The average for these items was used as the score for the experience variable. The Homework variable consisted of teachers giving students homework in art. The Likert scale was once a week, once a month, never or hardly ever. Other items which may have shed light on teacher practice were excluded from this analysis. Saving student work in a portfolio, exhibiting students' artwork, and showing videos, films, slides and TV about art were practices strongly entrenched in art classes at the time of the NAEP assessment.

Homework was the only variable that did not significantly predict visual arts achievement. Academic Aptitude ($\beta = 6.55$, $t = 3.47$, $p < .001$), Academic Attitude ($\beta = 18.9$, $t = 8.70$, $p < .0001$), Art

Secondary Analysis of the 1997 NAEP Visual Arts Regional Data

F. Robert Sabol

The field of art education has experienced great change over the past two decades. Many of these changes were precipitated by developments in the general field of education, while others came from practitioners, researchers, and policy makers within the field of art education. All of these changes were fueled by public interest in improving education and holding schools accountable for the education of children. These public interests resulted in creation of national education goals (U.S. Department of Education, 1994) and discipline content standards (Music Educators National Conference, 1994). When Congress declared the arts as a core subject necessary for the education of all learners (U. S. Congress, 1994), focus on art education sharpened. Researchers mobilized to investigate various aspects of the field. They sought answers to fundamental questions about the nature and practice of art education. Large-scale studies of art education designed to provide

Note: The part of Virginia that is included in the Washington, D.C., metropolitan area is included in the Northeast region; the remainder of the state is included in the Southeast region.

descriptive baseline information about teaching and learning in art education produced important findings about the field (Carey, Sikes, Foy, & Carpenter, 1995; Greer, W. D., Hine, F., Silverman, R., Zwissler, R., Hoepfner, R., & Rubin, B. M., 1993; Longly, 1999; National Art Education Association, 2001; National Endowment for the Arts, 1988; Sabol, 1998a, 1999, 2001; Snyder, & Hoffman, 2001). Additional large-scale studies attempted to discover transfers and linkages of learning between visual arts education and other disciplines (Burger, & Winner, 2000; Burton, Horowitz, & Abeles, 1999, 2000; Catterall, & Waldorf, 1999; Heath, & Roach, 1999; Oreck, Baum, & McCartney, 1999; Vaughn, & Winner, 2000; Wilson, B., 1997; Winner, & Cooper, 2000; Winner, & Hetland, 2000). These studies touched off a debate that continues between those who support the notion that arts education has power to transform teaching and learning by its links to achievement in other disciplines and by providing for the needs of the workforce and those who contend that arts education is of value in and of itself (Eisner, 1998; Goodwin, 2001; Hamblen, 1993; Lutfig, 1993, 1994; Murfee, 1995; Wolfe, 1999).

The above investigations provided a portrait of art education by describing contextual factors that impact art education programs and identifying types of learning and outcomes that result from art education. Without question these studies are of importance to all stakeholders concerned with understanding and improving the quality of art education. Curiously absent from this mixture of studies, are large-scale studies of visual arts education achievement; studies that describe what students have learned in art education programs and the degrees to which they have learned these things. The National Assessment of Educational Progress (NAEP) provides an opportunity to meet this need. By its design the 1997 NAEP in visual arts had as its goal to measure what students in 8th grade know and can do in the visual arts (National Assessment Governing Board, 1994). Findings from the NAEP in visual arts reported in *The NAEP 1997 Arts Report Card* (Persky, Sandene, & Askew, 1998) provided evidence of student achievement in visual arts education. NAEP assessments in 1974 and 1978 acted as driving forces for development of similar high stakes, large-scale, state level assessments and local assessments of visual arts
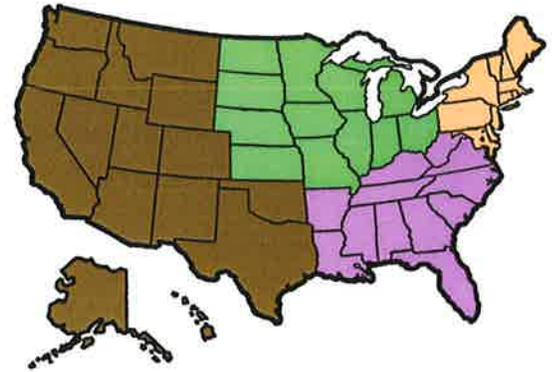
achievement in the 1980s (Sabol, 1990, 1994; 1998b; Shuler & Connealy, 1998). Given the current national interest in assessment, findings from the 1997 NAEP in visual arts once again have power to fuel development, implementation, and discussion of large-scale assessments in the field.

Statement of the Problem

The NAEP 1997 Arts Report Card (Persky et, al., 1998) included examples and descriptions of exercises on the 1997 NAEP and summaries of Responding and Creating performances by 8th grade students. Performances on the NAEP are traditionally reported by region, gender, race/ethnicity, type of school, and parents' education. Descriptive summaries of Responding and Creating scores for these groups were included in *The NAEP 1997 Arts Report Card*. It was possible to analyze and summarize performances of subgroups within the sample by combining Responding and Creating item responses with student and school questionnaire responses. Selected summary reports of findings from student questionnaires and school questionnaires were published in the report. Descriptive reports of item responses for these questionnaires were available on the National Center for Educational Statistics (NCES) website, while discussion and interpretation of them were not. Responses on these questionnaires provided contextual references about students and schools that contributed to understanding Responding and Creating performances. Additionally, they permitted examinations of how combinations of student and school variables are related to performances on the NAEP. Correlation studies of student and school variables with Responding and Creating performances are needed to identify the relationships among them. Such investigations will broaden understanding of achievement in visual arts education.

Art education programs are unique and draw on individual strengths of art teachers and available school and community resources. As a result, the quality and content of art education varies across school districts and among states and regions of the country. Bearing these differences in mind, a number of similarities are held in common among many art education programs as well. These similarities provide degrees of uniformity for the field and permit comparisons of programs and achievement. The 1997 NAEP Arts data provide a unique opportunity to identify similarities and differences in art education achievement in Responding and Creating. Although mean Responding and Creating scores for regions were reported in *The NAEP 1997 Arts Report Card*, profiles of student and school characteristics variables that influence Responding and Creating scores within regions were not. This raises a number of questions. For example, what variables influence regional Responding and Creating performances on the NAEP? How significant are these influences? Are these variables positively or negatively related to regional performances? Are there variables that have relationships to performance in some regions and not in others? Are there variables that have relationships to performances across regions? In consideration of these questions, the principal research question for this study was: What variables identified in student and school questionnaires on the 1997 NAEP in visual arts correlate with 8th grade Responding and Creating achievement in the four regions of the United States?

The intent of this study was to identify factor sets and independent variables that are of statistical significance within regions for Responding and Creating scores on the 1997 NAEP. Further, it was the intent of the study to identify the positive or negative relationships within regions that these variables had with Responding and Creating performances on the 1997 NAEP. Comparisons of regional scores are problematic due to sampling variations. Lack of sufficient numbers of subjects within regions prevented production of accurate estimates of the standard error causing comparisons of scores between regions to be unstable. However, because of the idiosyncratic nature of regional samples, examinations of student scores and their relationships to independent variables within specified regions can provide meaningful insight into discriminatory factors and related items.

Methodology

Data Organization and Analysis

Before data analysis began, several data organization issues related to the 1997 NAEP Arts database were resolved. To ensure that multiple regression analysis included only "valid" data, responses for each item were evaluated to determine their validity status. Responses including " illegible," "off task," non-ratable," "omitted," and "not reached" were recoded as "invalid" in the database. (See Appendix B for listing of recoded items.) Following recoding of data, regional subfiles were extracted from the database. Data analysis was conducted within these regional data subsets using plausible values provided by NCES as dependent variables and items identified within factor sets created by Diket for the research model as independent variables.

Data in the national sample were weighted for input according to gender, race/ethnicity, parents' educational level, region, and type of school demographic profiles. These demographic profiles are reflective of populations in the United States and ensure that individual or groups of scores include proportional representation of these groups in the sample. Plausible values were adjusted in light of grouping indicators for use as dependent variables by secondary analysts. Because NAEP samples are not random, original weights for Responding and Creating data must be used to account for clustering effects, oversampling, or the unequal probability of selection produced by the sampling design.

Subjects selected within regions were intended to representat national demographic profiles. This contributes to sample irregularities within regional populations. Regional original weights have not been created by NCES and creation of such weights was beyond the scope of this study. While the potential for national weight bias in regional analysis of data must be noted, Johnson (1989) reported that the bias effects of using NAEP national weights on regional data analyses prove to be minimal. Therefore, national original weights were used in multiple regression equations computed in this study for regions.

Replicate weights were used to consider possible effects for subjects having taken the full battery of blocks, instead of one, two, or three of the blocks. The .05 level of confidence was used to identify statistical significance of output for multiple regression equations. Some equation models produced explanations of variance at both the national (see Diket this publication) and regional levels for Responding or Creating scores. Other models produced explanations of variance at the national level but not at the regional levels.

Findings

The reports of findings for regions were divided into Responding and Creating categories. Tables provide references to categories identified on the research model and for variable sets identified within those categories. Multiple regression equations that produced p values of .05 or lower were included. Independent variables with p values of .05444 or lower were rounded and included for discussion. Although variables included in sets function in combination to explain statistical significance of sets, independent variables within sets producing independent t values significant at the .05 level of confidence or lower are noted to provide policy foci for each region.

Northeast Responding

In the Northeast Region, relationships linked to Responding scores were produced for five of the nine factor sets identified on the research model. These factor sets produced 10 independent variables with relationships to Responding scores (see Table 1). These variables combined to explain 37% of variance for Responding scores. The Northeast Region produced the lowest number of independent variables with relationships to Responding scores when compared to other regions studied. Significant independent variables positively related to responding in the Northeast Region were an encyclopedia in the home, the number of books in the home, going to art museums or exhibits while not in school, illustrating work in other school subjects, frequency of art class homework, students being told they are good artists, grades since 6th grade, and the amount of education students expect to receive. The amount of television students usually watched each day was negatively related to responding scores. Surprisingling, summer art programs were negatively related as well.

Table 1

Northeast, Responding : n = 560

Model Face	Factor Set	Independent Variable
Resources	Home	+ Is there an encyclopedia in your home?
	Home	+ About how many books are in your home?
	Home	- How much television do you usually watch each day?
	Arts Agencies	+ Not for School: Go to an art museum or exhibit?
	Arts Agencies	- Not for School: Go to a summer art program?
Opportunity to Learn	Classroom Practice	+ Ever illustrate your work in other school subjects?
	Classroom Practice	+ How often do you have homework for art class?
Demographics	Student Attitudes	+ People tell me I am a good artist.
	Academic Aptitude & Expectations	+ Which best describes your grades since grade 6?
	Academic Aptitude & Expectations	+ How much education do you expect to receive?

NOTE: Listed variables significant at .05 level of confidence.

Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

Northeast Creating

Four factor sets in the Northeast Region produced relationships with Creating scores. These included "Home," "Arts Agencies," "Classroom Practices," and "Academic Aptitude & Expectations." These factor sets produced nine independent variables with relationships to Creating scores (see Table 2). Combined, these variables explained 35% of variance for Creating scores. Parents' education, the number of books in the home, going to an art museum or exhibit while not in school, illustrating work in other school subjects, frequency of homework for art class, grades since 6th grade, and the amount of education students expect to receive were independent variables positively related from these sets. The amount of television students usually watched each day was negatively related to Creating scores, as was exhibiting artwork while not at school.

Table 2

Northeast, Creating: n = 560

Model Face	Factor Set	Independent Variable
Resources	Home	+ Parents' education.
	Home	+ About how many books are in your home?
	Home	- How much television do you usually watch each day?
	Arts Agencies	+ Not for School: Go to an art museum or exhibit?
	Arts Agencies	- Not for School: Exhibit your artwork?
Opportunity to Learn	Classroom Practice	+ Ever illustrate your work in other school subjects?
	Classroom Practice	+ How often do you have homework for art class.
Demographics	Academic Aptitude & Expectations	+ Which best describes your grades since grade 6?
	Academic Aptitude & Expectations	+ How much education do you expect to receive?

NOTES: Listed variables significant at .05 level of confidence.
Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

Southeast Responding

In the Southeast Region, five factor sets produced relationships to Responding scores on the NAEP. These included "Home," "Arts Agencies," "Culture," and "Classroom Practice," and "Academic Aptitude & Expectations." Thirteen independent variables produced relationships to Responding scores; eight were positive and four were negative (see Table 3). Variables in this group combined to explain 42% of variance for Responding scores. Variables positively related to Responding scores included parents' education, families regularly receiving newspapers, an encyclopedia in the home, the number of books in the home, going to art museums or exhibits while not in school, making artwork while not in school, illustrating work in other school subjects, grades since 6th grade, and the amount of education students expect to receive. Negatively related variables were identified in four factor sets. Among these variables were the amount of television students usually watched each day, exhibiting artwork while not in school, students use of alcohol, and working in a pair or group while in art classes.

Table 3

Southeast, Responding: n = 626

Model Face	Factor Set	Independent Variable
Resources	Home	+ Parents' education.
	Home	+ Does your family get a newspaper regularly?
	Home	+ Is there an encyclopedia in your home?
	Home	+ About how many books are in your home?
	Home	- How much television do you usually watch each day?
	Arts Agencies	+ Not for school: Go to an art museum or exhibit?
	Arts Agencies	+ Not for school: Make artwork?
	Arts Agencies	- Not for School: Exhibit your artwork?
	School	- What degree is student use of alcohol a problem?
Opportunity to Learn	Classroom Practice	- Art Class: Work in a pair or in a group.
	Classroom Practice	+ Ever illustrate your work in other school subjects?
Demographics	Academic Aptitude & Expectations	+ Which best describes your grades since 6th grade?
	Academic Aptitude & Expectations	+ How much education do you expect to receive?

NOTES: Listed variables significant at .05 level of confidence.
Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

Central Responding

In the Central Region relationships with Responding scores were produced for six of nine factor sets. These sets included "Home," "Arts Agencies," "Culture," "Classroom Practices," "Student Attitudes," and "Academic Aptitudes & Expectations." A total of 14 independent variables were identified from these sets (see Table 5). This group of variables explained 32% of variance for Responding scores. Of the 14 independent variables, 13 were positively related to Responding scores while only a single variable was negatively related. Positive relationships were identified for parents' education, families regularly receiving a newspaper, an encyclopedia in the home, the number of books in the home, going to an art museum or exhibit while not in school, the degree student absenteeism is a problem, painting or drawing in art class, illustrating work in other school subjects, students thinking they have talent for art, students being told they are good artists, discussing studies in school at home, grades since 6th grade, and the amount of education students expect to receive. The amount of television students usually watch each day was the single variable negatively related to Responding scores in the Central Region.
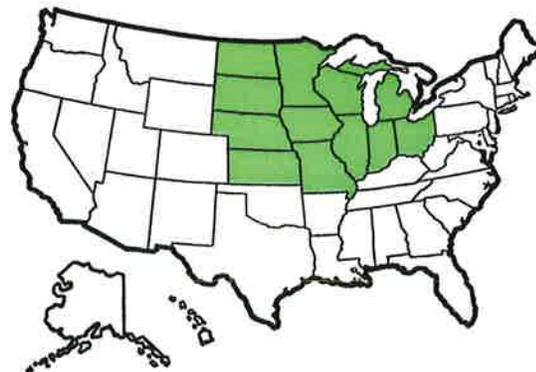
Table 5

Central, Responding: n = 683

Model Face	Factor Set	Independent Variable
Resources	Home	+ Parents' education.
	Home	+ Does your family get a newspaper regularly?
	Home	+ Is there an encyclopedia in your home?
	Home	+ About how many books are in your home?
	Home	- How much television do you usually watch each day?
	Arts Agencies	+ Not for School: Go to an art museum or exhibit?
	School	+ What degree is student absenteeism a problem?
Opportunity to Learn	Classroom Practices	+ Art Class: Paint or draw?
	Classroom Practices	+ Ever illustrate work in other school subjects?

Table 5 continued next page.

Table 5 continued.

Model Face	Factor Set	Independent Variable
Demographics	Student Attitudes	+ I think I have talent for art.
	Student Attitudes	+ People tell me I am a good artist.
	Academic Aptitudes & Expectations	+ How often do you discuss studies in school at home?
	Academic Aptitudes & Expectations	+ Which best describes your grades since grade 6?
	Academic Aptitudes & Expectations	+ How much education do you expect to receive?

NOTES: Listed variables significant at .05 level of confidence.
           Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

Central Creating

A total of five factor sets produced relationships to Creating scores in the Central Region. Among these were "Home," "Arts Agencies," "Classroom Practice," "Student Attitudes," and "Academic Aptitude & Expectations." Twelve independent variables were positively related while three were negatively related (see Table 6). These variables combined to explain 30% of variance for Creating scores. Positive relationships were identified for parents' education, families regularly receiving a newspaper, the number of books in the home, going to an art museum or exhibit while not in school, making artwork while not in school, painting or drawing while in art class, illustrating work in other subjects, students or teachers saving artwork in a portfolio, students being told they are good artists, discussing studies in school at home, grades since 6th grade, and the amount of education students expect to receive. Negative relationships were identified for the amount of television students usually watch each day, writing about artwork in art class, and viewing videos, film, slides or television about art in art class.

Table 6

Central, Creating: n = 683

Model Face	Factor Set	Independent Variable
Resources	Home	+ Parents' education.
	Home	+ Does your family get a newspaper regularly?
	Home	+ About how many books are in your home?
	Home	- How much television do you usually watch each day?
	Arts Agencies	+ Not for School: Go to an art museum or exhibit?
	Arts Agencies	+ Not for School: Make artwork?

Table 6 continued next page.

Table 6 continued.

Model Face	Factor Set	Independent Variable
Opportunities to Learn	Classroom Practice	+ Art Class: Paint or draw?
	Classroom Practice	- Art Class: Write about your artwork?
	Classroom Practice	- Art Class: Videos, film, slides, TV about art?
	Classroom Practice	+ Ever illustrate work in other school subjects?
	Classroom Practice	+ Do you/your teacher save your artwork in a portfolio?
Demographics	Student Attitudes	+ People tell me I am a good artist.
	Academic Aptitude & Expectations	+ How often do you discuss studies in school at home?
	Academic Aptitude & Expectations	+ Which best describes your grades since grade 6?
	Academic Aptitude & Expectations	+ How much education do you expect to receive?

NOTES: Listed variables significant at .05 level of confidence.
Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

West Responding

The West Region was the most robust, when compared to the other regions, in producing relationships among factor sets and Responding scores. All nine factor sets of the research model produced significant independent variables. From these sets a total of 25 variables were identified (see Table 7). These variables combined to explain 39% of variance for Responding scores. Independent variables with positive relationships to Responding scores included parents' education, families regularly receiving newspapers, an encyclopedia in the home, the number of books in the home, families that regularly receive magazines, going to art museums or exhibits while not in school, making artwork while not in school, keeping an art journal or sketchbook while not in school, students' attitudes toward academic achievement, parent involvement in schools, painting or drawing in art class, illustrating work in other school subjects, liking to do artwork, students being told they are good artists, discussing studies in school at home, grades since 6th grade, the amount of education students expect to receive, and district or state visual arts curriculum guides. Seven independent variables were negatively related to Responding scores in the West Region. These included the amount of television students usually watch each day, looking at or reading a book about art while not at school, making things of clay or other materials in art class, writing about artwork in art class, visiting an art museum or gallery during the past year in art class, volunteer teachers for 8th grade visual arts, and students thinking they have talent for art.

Table 7

West, Responding: n = 1,130

Model Face	Factor Set	Independent Variable
Resources	Home	+ Parents' education.
	Home	+ Does your family get a newspaper regularly?
	Home	+ Is there an encyclopedia in your home?
	Home	+ About how many books are in your home?
	Home	+ Does your family get magazines regularly?
	Home	- How much television do you usually watch each day?
	Arts Agencies	+ Not for school: Go to an art museum or exhibit?
	Arts Agencies	+ Not for School: Make artwork?
	Arts Agencies	- Not for School: Look at or read a book on art?
	Arts Agencies	+ Not for School: Keep an art journal or sketchbook?
	School	+ Characterize students' attitudes toward academic achievement.
	School	+ What degree is lack of parent involvement a problem?
Opportunity to Learn	Classroom Practices	+ Art Class: Paint or draw?
	Classroom Practices	- Art Class: Make things of clay or other material?
	Classroom Practices	- Art Class: Write about your artwork?
	Classroom Practices	+ Ever illustrate your work in other school subjects?
	Classroom Practices	- In last year, class visit art museum/gallery?
	Teachers' Education	- Volunteer teaches 8th grade visual arts.
Demographics	Student Attitudes	+ I like to do artwork.
	Student Attitudes	- I think I have talent for art.
	Student Attitudes	+ People tell me I am a good artist.
	Academic Aptitude & Expectations	+ How often do you discuss studies in school at home?
	Academic Aptitude & Expectations	+ Which best describes your grades since grade 6?
	Academic Aptitude & Expectations	+ How much education do you expect to receive?
	Geographic Characteristics	+ District or state visual arts curriculum?

NOTES: Listed variables significant at .05 level of confidence. Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

West Creating

As in findings reported for the West Region in Responding, the West Region was most robust in producing relationships among factor sets and Creating scores, when compared to the other regions. Seven of nine factor sets produced significant independent variables. They included "Home," "Arts Agencies," "Classroom Practice," "Teachers' Education," "Student Attitudes," Academic Aptitudes and Expectations," and Geographic Characteristics." Independent variables identified from these sets totaled 19 (see Table 8). This group of variables combined to explain 41% of variance for Creating scores. Positive relationships to Creating scores were identified with parents' education, the number of books in the home, families regularly receiving magazines, going to art museums or exhibits while not in school, making artwork while not at school, keeping an art journal or sketchbook while not in school, painting or drawing in art class, illustrating work in other school subjects, liking to do artwork, students being told they are good artists, discussing studies in school at home, grades since 6th grade, the amount of education students expect to receive, and district or state visual arts curriculum guides. Negative relationships to Creating scores were identified with the amount of television students usually watch each day, making things of clay or other materials in art class, visiting an art museum or gallery in the past year in art class, and students thinking they have talent for art.

Table 8

West, Creating: n = 1,130

Model Face	Factor Set	Independent Variable
Resources	Home	+ Parents' education.
	Home	+ About how many books are in your home?
	Home	+ Does your family get magazine regularly?
	Home	- How much television do you usually watch each day?
	Arts Agencies	+ Not for school: Go to an art museum or exhibit?
	Arts Agencies	+ Not for School: Make artwork?
	Arts Agencies	+ Not for School: Keep an art journal or sketchbook?
Opportunity to Learn	Classroom Practice	+ Art Class: Paint or draw?
	Classroom Practice	- Art Class: Make things of clay or other material?
	Classroom Practice	+ Ever illustrate work in other school subjects?
	Classroom Practice	- In last year, class visit art museum or gallery?
	Teachers' Education	- Volunteer teaches 8th grade visual arts.

Table 8 continued next page.

Table 8 continued.

Model Face	Factor Set	Independent Variable
Demographics	Student Attitudes	+ I like to do artwork.
	Student Attitudes	- I think I have talent for art.
	Student Attitudes	+ People tell me I am a good artist.
	Academic Aptitudes & Expectations	+ How often do you discuss studies in school at home?
	Academic Aptitudes & Expectations	+ Which best describes your grades since grade 6?
	Academic Aptitudes & Expectations	+ How much education do you expect to receive?
	Geographic Characteristics	+ District or state visual arts curriculum?

NOTES: Listed variables significant at .05 level of confidence.
Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

A Comparison of Significant Cross-Regional Variables

The preceding discussion provided regional profiles of factor sets and independent variables of significance related to Responding and Creating scores on the 1997 NAEP in visual arts. Regional variation was found among factor sets and among independent variables producing relationships with Responding and Creating scores. Additionally, a number of common factor sets and independent variables emerged as statistically significant within regions. The following discussion will identify those common factor sets and independent variables related to Responding and Creating scores across regions. In order to determine which factor sets and which independent variables were most common across regions, the number of regions in which factor sets and each significant independent variable related to Responding and Creating scores occurred within regions was compiled. Variables included in the report occurred in three or four of the NAEP regions. Because of unequal numbers of subjects in regional samples, variables identified in one or two regions may be found in less than half of the sample; therefore, they were not included in the listing. Previous regional reports can be reviewed to identify specific independent variables occurring in one or two regions. The intent of this discussion is to provide a summary of independent variables that have shown to be statistically significant in a majority of the regions in the country.

Comparing Cross-Regional Responding Variables

A cross-regional comparison of findings revealed that five factor sets produced relationships with Responding scores of the NAEP. These factor sets included "Home," "Arts Agencies," Classroom Practices," "Student Attitudes," and "Academic Aptitude & Expectations." From these factor sets, 10 independent variables were identified (see Table 9). Parents' education, families regularly receiving a newspaper, an encyclopedia in the home, the number of books in the home, going to an art museum or exhibit while not at school, illustrating work in other school subjects, students being told they are good artists, grades since 6th grade, and the amount of education students expect to receive were positively related to Responding scores in three or four of the regions. The amount of television students usually

watch each day was the single independent variable negatively related to Responding scores and it was negatively related in all four regions.

Table 9

Significant Cross-regional Variables, Responding: N = 2,999

Model Face	Factor Set	Variable	Northeast	Southeast	Central	West
Resources	Home	Parents' education.		+ X	+ X	+ X
	Home	Does your family get a newspaper regularly?		+ X	+ X	+ X
	Home	Is there an encyclopedia in your home?	+ X	+ X	+ X	+ X
	Home:	About how many books are in your home?	+ X	+ X	+ X	+ X
	Home	About how much television do you usually watch per day?	- X	- X	- X	- X
	Arts Agencies	Not for School: Go to an art museum or exhibit?	+ X	+ X	+ X	+ X
Opportunity to Learn	Classroom Practices	Ever illustrate work in other school subjects?	+ X	+ X	+ X	+ X
Demographics	Student Attitudes	People tell me I am a good artist.	+ X		+ X	+ X
	Academic Aptitude & Expectations	Which best describes your grades since grade 6?	+ X	+ X	+ X	+ X
	Academic Aptitude & Expectations	How much education do you expect to receive?	+ X	+ X	+ X	+ X

NOTE: Identified clusters significant at .05 level of confidence.
Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

Comparing Cross-Regional Creating Variables

A cross-regional comparison of findings revealed that four of nine factor sets including "Home," "Arts Agencies," "Classroom Practice," and "Academic Aptitude & Expectations" produced relationships with Creating scores on the NAEP. From these factor sets eight independent variables recurred (see Table 10). Parents' education, the number of books in the home, going to an art museum or exhibit while at

school, making artwork while not at school, illustrating work in other school subjects, grades since 6th grade, and the amount of education students expect to receive were positively related to Creating scores in three or four of the regions. The amount of television students usually watch each day was the single independent variable negatively related to Creating scores and it was negatively related in all four regions.

Table 10

Significant Cross-regional Variables, Creating: N = 2,999

Model Face	Factor Set	Variable	Northeast	Southeast	Central	West
Resources	Home	Parents' education.	+ X	+ X	+ X	+ X
	Home	About how many books are in your home?	+ X	+ X	+ X	+ X
	Home	About how much television do you usually watch per day?	- X	- X	- X	- X
	Arts Agencies	Not for School: Go to an art museum or exhibit?	+ X		+ X	+ X
	Arts Agencies	Not for School: Make artwork?		+ X	+ X	+ X
Opportunity to Learn	Classroom Practices	Ever illustrate work in other school subjects?	+ X	+ X	+ X	+ X
Demographics	Academic Aptitude & Expectations	Which best describes your grades since grade 6?	+ X	+ X	+ X	+ X
	Academic Aptitude & Expectations	How much education do you expect to receive?	+ X		+ X	+ X

NOTE: Identified clusters significant at .05 level of confidence.
    Plus (+) denotes positive relationship. Minus (-) denotes negative relationship.

Educational Implications of the Study

Profiles reported in this study reveal differences among regions that are not surprising. Unique combinations of independent variables reflect differences that might be expected among states, school districts, and local art education programs. In addition to producing differing regional profiles, this study identified a number of similarities among regional profiles. These similarities provide common ground upon which consensus for the field can be built.

In surveying findings reported in the regional profiles, it becomes apparent that results of multiple regression runs in all regions were more robust in identifying relationships between independent variables and Responding scores than for Creating scores. All nine factor sets from the research model produced relationships to independent variables for Responding scores. Only seven factor sets produced relationships for Creating scores. A combined total of 63 variables were of statistical significance in their relationship to Responding scores. Relationships with Creating scores were identified for a combined total of 51 independent variables. Cross-regional comparisons of findings revealed that a total of 10 independent variables produced statistically significant relationships with Responding scores, while 8 variables were identified for Creating scores.

The results of this study offer clear evidence that regional performances in Responding and Creating scores on the 1997 NAEP in visual arts were influenced by variables in factor sets identified in the research model. These variables represent the intricate interweaving of contributions from the home, school, and community with students and opportunities to learn that influence visual arts learning. They provide parameters within which achievement in visual arts education may be understood.

Recommendations

In light of the findings presented here, a set of recommendations will now be offered from which stakeholders can consider policy and actions for improving visual arts education. Understanding that differences in regional profiles were shown, the following recommendations are presented based on their potential to affect achievement in all regions. In presenting these recommendations two caveats must be stated. First, the recommendations that will be made represent a limited portion of those that could have been made. They are neither designed nor intended to be exhaustive. Second, the details of implementation and specific procedures for operationalizing them would be cumbersome and are beyond the specific province of this study. In their most productive and meaningful form, specific recommendations for each of the regions are left to be made by stakeholders and policy makers from the regions who are most familiar with regional and local resources and opportunities. In any case such recommendations should be the product of group deliberations.

- **Recommendation 1. Students should be encouraged and permitted to visit art museums and exhibits routinely.**

  Comparisons of findings suggest that a positive relationship exists between NAEP Responding scores in all four regions and Creating scores in three regions and visits to art museums or exhibits while not in school (see Table 9 and Table 10). Although art museums may not exist in or near all communities and art exhibits outside the school may not occur, the issue at stake appears to be one of access to works of art. Financial, distance, and opportunity restraints act as barriers that must be overcome. Implications for museum outreach programming and arts councils' support are obvious. Clearly, experiences with works of art contribute knowledge from which students can draw upon when creating and responding to works of art. No inferences can be gathered from the data about the frequency or quality of such visits or about the content or activities students experience or should experience during their visits.

  Less clear is the degree to which visits to art museums and exhibits by students while in school affect Responding and Creating scores. National sample response frequencies suggested that 2,283 students (76%) made no visits to art museums or exhibits during the

past year, while 620 students (21%) made one or two visits , and 58 students (2%) visited three or more times. What accounts for the strong relationship of out of school art museum or exhibit visits with achievement and the lack of an identified relationship to responding or creating performance while on field trips at school is unclear. The data do not suggest reasons for the absence of this relationship and attempting to explain this lack is a matter of conjecture.

- **Recommendation 2: Schools and art educators should provide a challenging educational environment and support for students that build positive student attitudes toward art and learning about the visual arts.**

Items on NAEP student questionnaires were helpful in revealing the relationships of students' attitudes and academic aptitude to Responding and Creating scores on the NAEP. Students' responses on questionnaire items suggested that academic aptitude has a positive relationship with Responding and Creating performance on the NAEP. The item related to academic aptitude in which students were asked to describe their grades since grade 6 produced positive relationships in all regions with Responding and Creating scores on the NAEP. Similarly, the item related to the amount of education students expect to receive produced positive relationships with Responding scores in all regions and in three regions with Creating scores. An additional item related to attitudes, "People tell me I am a good artist," was positively related to Responding scores in three regions. Curiously, this item did not produce a relationship in any region with Creating scores. These findings suggest that students' academic aptitude and attitudes toward art positively influence their scores on the NAEP. Catterall, Chapleau, and Iwanga (1999) reported similar links between academic aptitudes and attitudes and performances in music and theater achievement. The U. S. Department of Education (Snyder & Hoffman, 2001) published additional findings about student aptitudes and attitudes and their positive impact on performances on the NAEP in Language Arts from 1984 to 1994.

Students' perceptions about their academic and visual arts ability influence performances on the NAEP. Schools and art educators should work to create educationally sound environments that are academically challenging and that provide support for learning in visual arts programs. Exhibits, awards, and other public demonstrations designed to recognize learning in visual arts education can contribute to positive attitude formation and achievement among visual arts students and others. Such public exposure of learning in visual arts helps to build support for students and art education programs. Support for students through positive encouragement provided from art teachers is equally important. Art teacher interactions with students, both in the classroom and outside of it, contribute to improved responses to art and art learning and creative output from students. Building challenging and supportive educational environments and recognizing achievement in visual arts education programs requires participation by teachers, administration, parents, and the community. Establishing this base of support contributes to providing increased opportunities for students to learn and to maximizing development of students' abilities in the visual arts.

- **Recommendation 3: Students should be encouraged and required to use their art abilities in other classes.**

When students were asked if they illustrated their work in other classes, 1,822 (61%) responded that they did. This independent variable produced positive relationships with Responding and Creating scores in all regions (see table 9 and Table 10). The use of visual arts ability in other subjects enables students to express ideas and to demonstrate critical thinking and problem solving ability in ways that the use of other forms of communication may not. The use of artwork in completing tasks in all disciplines provides another viable means of communicating levels of learning for all students, including those who may be challenged to express themselves through writing or who have reading disabilities. Students should be encouraged to utilize visual imagery to express themselves by teachers outside the discipline of visual arts. Visual arts teachers must make efforts to encourage teachers in other disciplines to require and support students' use of their visual arts ability in completing assignments in other classes. Findings have shown that use of visual arts ability contributes to to Responding scores and to Creating scores on the NAEP. The positive relationship between responding and achievement in visual arts holds promise for similar improved responses in other disciplines through possible transference of learning. The interdisciplinary linkages of learning among disciplines are obvious. Use of knowledge, skills, and processes developed and used in the visual arts classroom can significantly contribute to learning in other disciplines. Conversely, knowledge, skills, and processes developed and used in other disciplines can contribute to learning in the visual arts classroom. This recommendation carries a caveat of which art teachers must be aware. In pursuing this recommendation, visual arts teachers must be vigilant in ensuring that the content of art education remains intact. This recommendation is not intended to suggest that the content of visual arts should become subordinate in students' expressions of learning in other disciplines, but rather that it contribute to expressions of learning in other disciplines.

- **Recommendation 4: Students in visual arts programs should regularly engage in reading and studying quality printed and electronic materials.**

An examination of significant independent variables identified in the "home" factor set suggests that availability of various reading materials is related to Responding and Creating scores on the 1997 NAEP (see Table 9 and Table 10). The data do not support a correlation between availability of reading material in the home and students engagement in reading such materials. However it is possible to conclude that if students are aware that reading material is available in the home, they may choose to make use of such materials for homework or pleasure reading.

With ever-increasing attention being given to literacy in schools and the workplace, visual arts teachers should be given resources to provide reading materials for their students. Additionally, they should require their students to read and study reading materials routinely in art activities and for exhibits. The relationships between increased emphasis on reading and achievement in visual arts education and of increased reading in visual arts education and development of reading ability are unclear (Burger & Winner, 2000; Eisner, 1998; Murfee, 1995). Art educators should clearly understand the purposes of this recommendation. The intent of this recommendation is not to target the improvement of students' reading ability; instead, reading provides visual arts teachers with another vehicle through which students can learn in visual arts classrooms. Findings from this study indicate that a cluster of positive relationships between availability of reading materials and

Responding and Creating scores on the NAEP exists. Art educators should explore this option of increased reading for improving students' expressions of creating and responding learning. Further, researchers should study this relationship to determine its affect on learning in visual arts education.

In addition to reading material, another learning resource available for art teachers' use is the medium of television. Although the amount of television students usually watch each day was negatively related to Responding and Creating scores in all four regions, condemnation of the impact of television on learning may not be fully warranted. Television viewing has become an ingrained aspect of the American way of life and culture. Its impact on American society has been pervasive. It shapes attitudes, challenges or perpetuates values, informs, and entertains. Television viewing is generally a passive action. Viewers act as receptors during the viewing experience and cannot easily interact with programming provided, other than to "change the channel." Viewers may not determine the themes or content of programs. Rarely are viewers invited to critically think or problem solve. Debates continue about the merits or redeeming quality of available programming, and studies have attempted to determine the effects of television viewing on various behaviors ranging from its influence on crime rates to its impact on product consumption. Concerns about the appropriateness of television content led to creation of a program rating system to help viewers determine the acceptability of program content. In spite of these concerns, art teachers should consider use of television, video tape recordings, and other electronic technology, including computers digital cameras, and other electronic devices, capable of providing visual arts education content, as acceptable tools for improving visual arts education learning. Use of these forms of technology allows students and teachers to present, study, and review visual arts education content at a pace appropriate for ease of learning. Television programs, cds, videos, and internet websites with educationally acceptable content for art education are readily available. Visual arts teachers should use these materials regularly as a tool for meeting the goals of their art education programs.

- **Recommendation 5: Schools should build partnerships with families and the community to improve art education.**

Factor sets identified in this study, including "Home," "Arts Agencies," "Classroom Practices," "Student Attitudes," and students' "Academic Aptitude and Expectations" produced significant relationships across all regions for Responding and Creating scores. These factor sets represent an array of individuals with connections to visual arts education programming in schools.

Visual arts education programs depend upon a broad base for support. Creating such a base requires schools and art educators to inform those included in the base and to involve them in an ongoing basis with making decisions that affect art education programs. Informing students, parents, teachers, administration, school boards, businesses, colleges and universities, arts councils, state departments of education, and state legislatures and including them in the decision-making process, whenever possible, is essential for building and maintaining quality art education programs. Schools and art educators must actively engage in base building. They must encourage ongoing participation by stakeholders in the growth and development of their programs. Hasselkorn and Harris (2001) reported that greater parental involvement in their children's education was third most significant factor

in lifting student achievement after ensuring schools were safe from violence and ensuring a well-qualified teacher was placed in every classroom.

Recommendations for involving families and members of the community in the functions of schools have been made repeatedly (Dobbs, 1998; Gary & Foy, 1997; Goodwin, 2001; Hasselkorn & Harris, 2001; Longley, 1999; U. S. Department of Education, 2000; Wilson, 1997). Recommendations for involving families and members of the community included participation in educational reform initiatives, site based management programs, PTA and other support groups, advocacy programs, attendance at school meetings including open houses, parent conferences, or art exhibits, field trips, generation of art education policy, and curriculum, assessment and textbook decisions. The principal source of power families and the community possess is in their ability to network to actively promote the importance of art education and to express the importance of the visual arts in the social, civic, and cultural lives of the community. Banding together they can influence decisions by creating consensus among the school board, the school superintendent, and major segments of the community that the arts are important and an essential part of learning for all students.

Conclusion

The field of art education has experienced great changes since the previous NAEP assessments in the visual arts during the 1970s. These changes have resulted in national visual arts curriculum, art teacher certification, and preservice art teacher preparation standards, increased use of technology in the art classroom, broader focus on modes of learning in visual arts education, increased emphasis on critical thinking and problem solving, expanded interdisciplinary learning, and focus on diversity and multicultural education for art education. Each of these has contributed to altering the nature of art education in unique ways. However, the impact of assessment on art education has been profound. Art educators and art students in every classroom in America have been affected by assessments. Local, district, and state art assessments are a common part of the current art education landscape. Art education policy routinely includes emphasis on assessment. The public increasingly has come to rely on assessment results to gauge progress in all aspects of education. The 1997 NAEP is another example of this growing emphasis on assessment in art education. The design of the 1997 NAEP and its use of authentic assessment exercises that focused on Responding and Creating processes corresponds with current thinking in the field (Burton, Horowitz, & Abels, 1999; Catterall, & Waldorf, 1999; Clark, Zimmerman, & Zurmuehlen, 1987; Hausman, 1998; Sabol, 1994, 1998b, 2001; Sabol & Zimmerman, 1987; Zimmerman, 1992, 1999). Art educators can look to the NAEP as a practical model for development of assessment exercises that include knowledge, skills, and processes for measuring achievement in their classrooms or school districts. Examples of scoring criteria and procedures included in *The NAEP 1997 Report Card* (Persky et al., 1998) provide a source to which art teachers can refer in developing rubrics for assessments.

As it exists the 1997 NAEP Arts provided a glimpse of visual arts achievement in the United States. Measurement of visual arts achievement through the NAEP should be routinely done, as it is in other disciplines. The rationales for assessments in other disciplines and resulting knowledge and benefits such assessments provide appropriately apply to assessments of visual arts achievement. Limitations of the data and needs of the field suggest a broader scale for future NAEP assessments. Future NAEP assessments could be expanded to include stronger emphasis on aesthetics and art history. Exercises may be designed to include group interactions and oral responses to stimuli. Exercises designed to incorporate formative evaluations of student work by test givers and students have potential to substantially expand

understanding of students' thinking and problem solving ability. Selected test items or exercises should be restricted and incorporated in successive NAEP assessments in order to track achievement related to those items. Banks of items could be publicly released to serve as models for state and local assessment development, as was done with past NAEP arts assessments in the 1970s. Of particular interest would be assessments of elementary and high school students. Assessments at these instructional levels would provide a continuum in which achievement could be tracked. Regular periodic NAEP assessments would permit longitudinal studies of achievement while enabling assessment developers and researchers to incorporate changing knowledge and technology in those assessments. An example of this may be found in comparison of the 1997 NAEP Arts test with those from the 1970s. Stark differences in assessment strategies, content, and processes are easily identified. As part of the historical record, these assessments reflected the best thinking and practices from the periods in which they were created and used. They provided and will continue to provide direction for curriculum, instruction, and assessment development for art teachers and researchers.

The field of art education is diverse and rich in its variety. Art education varies in terms of curriculum, instruction, assessment, materials, and resources from district to district and classroom to classroom. Studies of the 1997 NAEP Arts data in this report are of value to the field in that they identified regional differences that influence Responding and Creating achievement. Art teachers, policy makers, and other stakeholders can design policy, create programming, and allocate personnel and resources based on understanding of findings specific to their region. The unique regional profiles of variables that positively influenced Responding and Creating performances on the 1997 NAEP permit art educators to focus on those variables and make use of them in improving students' visual arts education. Knowledge of variables that negatively influence Responding and Creating achievement will help art educators understand their impact on achievement and assist them in taking action to address them.

The 1997 NAEP Arts database is an invaluable resource for the field of art education. The 1997 NAEP Arts Report Card and studies such as the ones reported here are only a sampling of types of information that can be of value to the field about student achievement in art education. Research agendas suggested by Eisner (1997), the Goals 2000 Arts Education Partnership (Murfee, 1997), The National Art Education Association (National Art Education Association, 1996), and The National Endowment for the Arts (1988) include an array of topics for further research that could be conducted using the database. For example, the 1997 NAEP visual arts assessment included students who were not in art classes or who had not taken art classes. Studies of performances on the NAEP by students who were enrolled in art classes at the time of the test or who had taken art classes prior to the test would provide valuable information to those in the field concerned with the levels of achievement of students involved with visual arts education. Findings from such studies may provide significant differences in both Responding and Creating scores. Of additional interest are studies of urbanicity and its effects on test performances. Data were coded for urbanicity and samples included students representing rural, urban, and suburban locations. The 1997 NAEP Arts Report Card did not include a report of student performances in relation to urbanicity. Extensions of the regional studies previously discussed in this report could include additional studies of the relationships between regions and urbanicity or creation of national profiles of performance on the NAEP based on urbanicity. A variety of additional studies of the 1997 NAEP Arts data hold potential to provide unique insights into visual arts achievement in art education.

Assessments such as the 1997 NAEP Arts provide guideposts for the field. They provide evidence by which the public and those in the field can judge the quality of art education produced in schools and from which they may create art education policy. NAEP assessments in the visual arts can provide direction for change and guide that change by sampling its effect. As with any form of assessment, it is

important for art educators to carefully monitor the meaning of assessments, being careful to heed the messages they provide, while being aware of their power to dictate the future course of art education.

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Methodology

In the original NAEP assessment, 2,999 eighth grade students were given various blocks of tests and tasks. Some blocks required students to respond to visual material, while others involved creative, artistic tasks. This marked a notable advance in NCES' testing procedures: it was the first time they had developed and administered actual artistic tasks (Carr & Crovo, 1999).

Various questions and test results contained in the National Center for Education Statistics (NCES) data sets were coded in a number of different ways and on different scales depending on the types of responding questions asked and how the creative artwork was rated by trained evaluators, scoring artwork and responses, as shown in the illustrations on pages 61 and 62. In order to undertake the quartile analysis, different measures were needed. Two new variables, New Responding Variable and New Creating Variable, which were based on the students' responding test results and on their creative task results, respectively, were constructed as independent variables. The New Responding Variable represented student answers to all the questions that were identified as open-ended response-type questions. They were combined into a single mean score for each individual student based on their responses to the selected questions. Similarly, questions that were identified as rater evaluations of creating tasks were also selected and combined to produce a single mean score for each individual student based on the rater evaluations of their artwork. These produced the New Creating Variable. Because answers to the responding questions were coded in several different ways, and rater evaluations of the creating tasks were also coded in different ways, it was necessary to recode the data into a consistent format that could be compiled into the new variables which represented the means of the respective responding and creating variables.

Lower Quartile

Insufficient for Self-Portrait. Most self-portraits at this level were so schematic as to convey little or nothing about the artist. Like this one, they showed unspecific observation, little awareness of composition, and highly unskilled use of materials.

Explain what you hoped to communicate about yourself in your drawing

good

Discuss at least three specific things about your self-portrait that communicate your personality. In your answer, talk in detail about how you used the oil pastels and/or charcoal to create the things you talk about

Unacceptable for Self-Evaluation. This response leaves most of the question blank. Many other students at this level evaded the question by simply stating that they resembled their self-portraits.

From the CD version of the *NAEP 1997 ARTS Report Card*, p. 230.

The New Responding Variable was first weighted with the original weights (AORIGWT), and then sorted in descending order. This produced a range of mean scores from high to low. The 2,999 responding cases were thereupon partitioned into four quartiles of 749 cases each. The high quartile ranged from Case 1 to Case 749, and the low quartile ranged from Case 2,250 to Case 2,999. The middle 1500 cases were not considered as part of the quartile analysis.

The same procedure was applied to the creating cases. It should be noted that only 2,105 students engaged in the creating tasks. The New Creating Variable, based on the mean scores derived from each individual's creating scores, was first weighted with its original weight (CORIGWT), and then sorted in descending order. The result was a range of mean scores from high to low. The 2,105 creating cases were then partitioned into four quartiles of 526 cases each. The high quartile ranged from Case 1 to Case 526, and the low quartile ranged from Case 1,579 to Case 2,105. Again, the middle 1052 cases were not considered in quartile analysis.

The NAEP data sets contained literally hundreds of factors that exhaustively surveyed many aspects of the students' backgrounds, attitudes, education, schools, teachers, parents, and other general demographic factors. The author chose to concentrate on only those 108 items identified in factor analyses that could directly effect the education of the students.

Each student who participated in the NAEP assessment completed a survey related to his or her general background. In the data set, this information is located under variables with the prefix B0. Each student also filled out a survey seeking information about his or her attitudes regarding art and the amount, type and quality of art instruction they received, prefixed BV. In addition, representatives within the schools completed a school questionnaire, prefixed SQ. These three surveys constitute the variables compared to the New Responding Variable and the New Creating Variable.

At that point, high- and low quartiles for each selected variable were compared to the New Responding Variable and New Creating Variable within quartiles. Because the number of possible responses within each question varied, and both responding and creating variables were calculated for each possible answer, a total of 314 comparisons between quartiles were generated, along with margins of error.

Each low quartile was subtracted from its corresponding high quartile, yielding a percentile quantity that represents mean difference. These percentile differences are the focus of our investigation. A margin of error test was applied to each of the 314 comparisons. The margin of error formula is:

$$\sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}$$

where p_1 is the high quartile decimal, p_2 is the low quartile decimal, n_1 is the number of cases of the high quartile (749 for Responding and 526 for Creating), and n_2 is the number of cases of the low quartile (749 for Responding and 526 for Creating). Those factors that did not meet the margin of error challenge were dismissed; similarly, those factors showing less than a 10.0% difference between high- and low quartiles were dismissed as insignificant in this analysis.

Of these 314 comparisons, 101 (32.1%) were above 10%. Of these, only 13 (4.1%) showed quartile differences of 20% or more, while another 29 (9.2%) gave quartile differences between

Upper Quartile

Sufficient for Self-Portrait. The student work chosen to show the highest level of ability in this Creating task demonstrates clear and specific observation, identifying detail, purposeful use of compositional elements, sensitive use of materials, skillful use of proportion and line, and is quite fully developed and individualized. Few students were able to achieve this level of performance. The student who created this self-portrait has experimented with placement, pose, and use of charcoal reminiscent of Kollwitz's work.

Partial for Self-evaluation. Students who received scores of Partial for this exercise tended to make specific observations about their self-portraits without clearly linking those observations to what it was they wanted to convey. This student states that he likes to draw and then briefly mentions drawing well and "drawing dark when angry." While these links to the portrait merit partial credit, they are not clear or specific enough for a higher score.

Abridged from the CD version of the *NAEP 1997 ARTS Report Card*, p. 234.

15% and 19.9%. Fifty-nine (18.8%) quartile comparisons ranged between 10% and 14.9%, with 213 (67.8%) falling between 0.0% and 9.9%. Many within the 0.0% to 9.9% range did not meet the margin of error challenge. See Table 1.

The author arbitrarily designated 10.0% as the bottom limit of quartile differences. This leaves 46 variables, ranging from a maximum of 27.8% to 10.0%, for analysis. Of these 46 variables, 9 (19.5%) were derived from the background survey. (It should be noted that several items from the background survey are synthesized into DRACE, HOMEEN and PARED.) Fourteen (30.4%) came from the student survey, and 22 (47.8%) derived from the school survey.

This quartile analysis concentrates on 101 comparisons (contained within 51 variables) that demonstrate quartile differences of 10% or more. The quartile differences (HiQ – LoQ) are arranged in the descending order. Differences of less than 10%, and those that did not meet the margin of error challenge, have been excluded. In some cases, a negative number resulted, meaning the low quartile was larger than the high quartile. Almost all of the cases may be interpreted positively because they represent a negative answers or low ranks within the particular question. See Table 1.

Table 1:

Summary of Quartile Difference of Independent Variables.

Model Face and *Factor Set* refers to the Structural Model following the Executive Summary. Table # refers to the number of the table on subsequent pages. *Independent variable* refers to a single variable within the NAEP 1999 arts data set. *Category* refers to answer option within the independent variable. *Responding* and *Creating* refer to quartile differences made on responding and creating variables specifically. Plus (+) and minus (-) signs refer to the direction of the difference between the high and low quartiles; + means the high quartile is greater than the low quartile; - means the low quartile is greater than the high quartile. In some cases, the minus sign is marked with an asterisk (*). In those cases, the question may have been stated in the negative, or the answer category may be negative (no, disagree, never or hardly ever) or low (0%), resulting in a negative difference between the high and low quartiles. However, the difference may actually be *interpreted* as positive.

Model Face	Factor Set	Table #	Independent Variable	Category	Responding	Creating
Resources		5	DRACE (race/ethnicity)	white	+	+
				black	-	-
		8	HOMEEN (home environment)	4 var.	+	+
				0-2 var.	-	-
	Home	9	Is there an encyclopedia in your home?	Yes	+	+
		10	How many books are in your home?	+100		+
		11	Does your family get magazines regularly?	Yes	+	+
		13	PARED (parent education)	grad college	+	+
				grad H.S.	-	-
				not grad H.S.		-

Table 1 continued, next page.

Model Face	Factor Set	Table #	Independent Variable	Category	Responding	Creating
	Art Agencies	3	Not for school: Make art	yes	+	+
		49	Not for school: Keep an art journal or sketchbook	yes		+
		50	Not for school: Go to art museum or exhibit	yes	+	
Resources	School	6	Does your school receive Chap I/ Title I funding?	yes / no	-	- / +
		7	Percent of 8th graders repeating 8th grade	1%-2%	-	-
		14	Percent of students instructed in visual arts	61%-80%	+	
		16	Space for teaching visual arts	studio w/ equipment	+	+
		17	Characterize morale of teachers	very positive somewhat positive		+ +
		25	District or state has a visual arts curriculum	yes	-	
		31	Computers available in classroom	no	+	
		34	Is student absenteeism a problem?	not a problem	-*	
		35	Number of school days missed this month	none	+	
		36	Percentage of students absent on a given day	0%-2%	+	
		37	To what degree are physical conflicts a problem?	moderate problem minor problem	-	-
		40	What degree is teacher absenteeism a problem?	minor problem	-	
		42	To what degree is gang activity a problem?	moderate problem minor problem		- +
		45	Full-time specialist teaches 8th grade art	yes	+	
		46	Percentage of teachers who leave before the end of the school year	0%	-	
	Expanded Art Experiences	29	In the last year, any visiting artists?	yes	+	
		38	In the last year, any sponsored artists' programs?	yes	+	+
		52	How many 8th grade visual art field trips last year?	yes	-	
Opportunity to Learn	Classroom Practice	15	Do you ever illustrate your work in other subjects?	yes no	+ -*	-*
		19	Are you taking art now or in the past year?	yes	+	+
		23	Art class: Paint or draw	every day never		+ -*
		27	How often does your teacher exhibit your art?	1-2 a year never	+ -*	+ -*
		28	Does your teacher save your art in a portfolio?	yes		+

Model Face	Factor Set	Table #	Independent Variable	Category	Responding	Creating
		4	People say I am a good artist	agree	+	+
				disagree	-*	-*
		12	I like to do artwork	agree	+	+
		18	I like to show my artwork to others	disagree		-*
	Student Attitude	26	I think I have talent in art	agree		+
				disagree		-*
		41	I like to look at art	agree	+	+
		48	Art class: Talk with others about your art	never		-*
		2	Which best describes your grades since 6th grade?	mostly A's	+	+
				mostly C's		-*
		30	How often do you use a computer at home for homework?	no computer	-*	-*
				1-2 month		+
	Student Aptitude and Expectations			1-2 week	+	
		43	How much TV do you usually watch every day?	6 hrs or more		-*
		44	How much education do you expect to receive?	grad school	+	
				finish college		+
Demographics				finish H.S.		-*
		47	Students' attitude toward academic achievement	very positive	+	+
		51	How often do you read for fun on your own?	never	-*	
		21	Degree lack of parental involvement is a problem	not a problem		+
		22	Degree that parents participate in open house	51%-75%		+
				26%-50%	-	
	Family			0%-25%		-*
		24	Parents participate in teacher conferences	51%-75%	-	
				76%-100%	+	+
		32	Changed schools and moved in last 2 years?	none	+	+
		33	Changed schools but didn't move in last 2 years?	none	+	

Analysis of the Data

The purpose of quartile analysis is to compare the highest scorers of a selected variable to the lowest scorers. In this way, differences are polarized and generally become more dramatic by contrast.

In the following tables, each of the quartiles will be interpreted in turn. High quartile percentages are labeled HiQ; low quartile percentages are labeled LoQ. The percentage differences between the high- and low quartiles of the responding and creating scores are labeled HiQ – LoQ. The differences (HiQ – LoQ) have been arranged in hierarchical order, from the highest quartile difference to a minimum limit of 10.0%. The descending order is indicated in **boldface** to make it more obvious. Other (unbolded) percentages represent differences above 10.0 within the same variable. The margin of error is shown as M/E. As long as the margin of error is less than the difference between the quartiles (HiQ – LoQ), the quartile difference meets the margin of error challenge.

Table 2. BO00021   Which best describes your grades since 6th grade?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Mostly A's	43.3	16.2	27.1	2.25	43.8	16.0	**27.8**	2.25
Mostly C's					12.0	25.4	- 13.4	1.97

The greatest quartile differences in both the responding and creating scores were in the area of grades in middle school. The differences exceeded 27.0% in both cases for the rank, "Mostly A's." This suggests that those students who demonstrate high academic achievement in art (the high quartile group) also have much greater academic achievement overall than students who achieve less success in art (the low quartile). This is borne out by a – 13.4% difference for "Mostly C's" in the creating quartiles.

Table 3. BV00024   Not for school: Make art

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	67.5	50.3	17.2	2.51	70.0	45.7	**24.3**	2.47

Self-motivation is a big factor in success in art. Students (and adults) who achieve in art tend to pursue creative endeavors on their own time and for their own intrinsic rewards. "Not for School: Make Art" indicates that making art outside the school environment, and therefore, not as assignments or required by an art teacher, is a strong factor in creative activity. This factor registered with large quartile differences in both Creating scores (24.3%) and Responding scores (17.2%). Making art outside of school appears to contribute to both creative ability and to the ability to respond to and interpret art.

Table 4. BV00004   People tell me I am a good artist

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Agree	44.6	28.5	16.1	2.45	48.3	25.4	22.9	2.42
Disagree	28.4	44.0	-15.6	2.47	26.6	50.1	**-23.5**	2.91

The percentages between "Agree" and "Disagree" are virtually the same for both Responding (16.1% versus – 15.6%) and Creating (22.9% versus – 23.5%), except the sign changes between the quartiles. That is, virtually the same percentage of students in the high quartile agree with the statement as disagree with it in the low quartile. The shift is both dramatic and balanced. Self-perception as an artist may contribute greatly to one's desire to pursue art as an activity and as a school subject.

It appears the respondents were divided into equally polarized extremes. Whether their perceptions of others' opinions are valid, or simply reflections of their own esteem, cannot be interpreted here. It does suggest, however, that it is important for art teachers to actively shape and regularly cultivate how students perceive their peers' art through group discussions and critiques where the emphasis remains positive and constructive. Students need to be drawn into reflective situations in which they essentially ask themselves whether they are good artists, and then reinforced for their strengths.

Table 5. DRACE   Race/Ethnicity (derived from 2 background questions)

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
White	84.2	60.9	**23.3**	2.26	82.6	59.7	22.9	2.70
Black	6.4	22.1	-15.7	1.76	3.0	22.7	-14.7	2.09

Race/ethnicity indicates a large difference in representation for both the responding and creating quartiles. Over 80% of the high quartile and about 60% of the low quartile (both Responding and Creating) are white, while only 6.4% (Responding) and 8.0% (Creating) of the high quartile and over 22% of the low quartile are black. This results in positive differences of over 22% for white students in both the Responding and Creating variables, but a negative differences (more blacks in the low quartile) of around 15% for the black students. This indicates that a higher percentage of whites populate the high quartiles while a higher percentage of black students occupy the low quartile. Many factors are likely to contribute to this disparity, possibly lack of resources opportunities to learn.

Table 6. SQ00094   Does your school receive Chapter I/Title I funding?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	33.0	50.8	-17.8	2.40	34.0	56.9	**-22.9**	2.55
No					64.0	42.5	21.5	2.51

Many more students in the low quartile attend schools that receive Chapter I/Title I funding than students in the high quartile, as represented by the negative percentages in both Responding and Creating. Chapter I/Title I schools are more likely to be underfunded and have poorer facilities, resources, and teachers than schools that do not receive such funding. It is not surprising that this would be reflected in the overall achievement in art among their students.

Table 7. SQ00131   Percent of 8th graders repeating 8th grade

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
1% - 2%	28.4	51.2	**-22.8**	2.46	36.2	51.6	-15.4	2.53
0%	50.3	39.7	10.6	2.50				

Schools where 8th graders repeat 8th grade generally fall into two ranks: 0%, where very few repeat, and 1% - 2%, where a small percent repeat. Less than 10% have a repeat rate of 3% and more. The question indicated that students in the low quartiles in both Responding and Creating tend to attend schools where the repeat rate is 1% - 2%, while students in the high quartile go to schools where there is a negligible repeat rate. This is consistent with other questions that reflect where overall academic achievement is high, achievement in art is also high.

Table 8. HOMEEN   Home environment (articles of 4 in home)

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
4 types	58.6	36.6	**22.0**	2.51	54.2	37.4	16.8	2.71
0 - 2 types	13.6	31.1	-17.5	2.10	16.2	32.1	-15.9	2.59

Table 9. B000008   Is there an encyclopedia in your home?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	84.4	73.1	11.3	2.09				

Table 10. B000009   How many books are in your home?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Over 100 books					50.0	31.3	18.7	2.49

Table 11. B000010   Does your family get magazines regularly?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	87.2	74.6	12.6	2.00	84.5	72.0	12.5	2.10

Csikszentmihalyi, Rathunde, and Whalen observed in *Talent Teenagers* (1993), "A family that provides a teenager with a sense of support and consistency, and encourages her or his intensity and self-direction, enhances attentional capacities for finding challenges and for mastering them" (p. 174). HOMEEN: "Home environment," as shown in Table 8, is a synthesis of four questions, B000007: "Does your family get a news paper regularly," B000008: "Is there an encyclopedia in your home," B000009: "About how many books are in your home," and B000010: "Does your family get magazines regularly." In homes with a bountiful reading environment as shown by agreement with all four questions, there is a large margin between the high- and low quartiles in both Responding and Creating. This relationship reverses (low quartile greater than high quartile) in homes where only 0 – 2 answers were positive. The differences between the positive and negative percentages exaggerate the disparity even more. An intellectually stimulating and resourceful environment at home can very likely contribute to positive attitudes toward academic achievement as well as actual artistic achievement.

Specifically, three of the questions, "How many books are in your home," "Does your family get magazines regularly" and "Is there an encyclopedia in your home," as indicated in Tables 9, 10 and 11, broke the 10.0% threshold. I am including them here, in relation to the HOMEEN question. In response to the question, B000008: "Is there an encyclopedia in your home," 11.3% more of the high quartile creating students answered, "yes," than did the low quartile students. B000009, "How many books are in your home," yielded a reply of 50.0% from the high quartile creating students of "more than 100 books, " and 31.3% from the low quartile creating students, with a robust difference of 18.7%. "For the question, B000010: "Does your family get magazines regularly," they were answered in the affirmative for both responding (12.6%) and creating (12.5%).

Table 12. BV00002   I like to do artwork

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Agree	71.7	58.1	13.6	2.44	77.2	55.7	**21.5**	2.37

Positive attitude is clearly a contributing factor to achievement of any kind. Students who agree with the statement, "I like to do artwork," are likely to achieve well in their artistic endeavors. This is borne out by a positive difference of 21.5% between the high- and low quartile in Creating, and (a somewhat lower) 13.6% difference in Responding.

Table 13. PARED   Parents' education (derived from 2 background questions)

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Graduated college	56.8	40.7	16.1	2.54	57.9	37.4	**20.5**	3.01
Graduated H.S.	16.7	27.8	-11.1	2.12	15.6	28.3	-12.7	2.52
Did not finish H.S.					1.2	11.8	-10.6	1.48

"Parents' education" was derived from separate questions about the father's and mother's respective educations. There are strong differences between the quartiles in both Responding and Creating for students of parents who have graduated from college and those who have graduated from high school. However, the differences reverse between these two groups. There is a strong positive difference (high quartile over low quartile) for students who parents are college graduates, and a negative difference (low quartile over high quartile) for those whose parents only graduated from high school. Many factors can contribute to this, including positive attitudes toward academic, artistic and other forms of achievement by the parents, and higher incomes and therefore, greater resources for academic and artistic achievement.

Table 14. SQ00088   Percent of students instructed in visual arts

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
61% - 80%	26.0	06.3	**19.7**	1.73				
81% - 100%					41.9	30.6	11.3	2.51

Mac Arthur Goodwin, President of the National Art Education Association, stated emphatically, "Priority should be given to learning in the visual arts, so that all students graduate with an informed appreciation and understanding of them. Schools are the only institutions specifically responsible for ensuring that all students learn about the visual arts" (2001, p. 3). For this question, the actual percentages of 8th graders taking art, as well as the differences between the quartiles, is instructive. Typically, in middle school, students take a required art course in 6th or 7th grade. Taking art in 8th grade is generally an elective. Therefore, in schools where a large percentage of 8th graders take art, art is likely to be strong, desirable and prestigious. About two-thirds (67.9%) of the 8th graders in the high quartile take art in schools where 60% or more take art. Only about one-third (36.9%) of the 8th graders in the low quartile take art in such schools.

There is a relatively low percentage of high-quartile Responding students (26.0) taking art among schools where 61% - 80% of the students take art, but a very low percentage of low-quartile Responding students (6.3%) in similar schools. The difference between the quartiles is 19.7%. This suggests the 8th

graders taking art in these schools are generally high achievers in art, and indeed are taking art as selected electives.

Although the difference between the quartiles is not as great, many more students appear to take art in schools where almost all students (81% - 100%) take art than in schools where a somewhat lower, though still substantial, percentage (61% - 80%) take art. This suggests that in schools where art is a priority, the disparity between high- and low quartiles begins to close. Considering that relatively few 8th graders take art (see Table 16), this is an important finding.

Table 15. BV00017   Do you ever illustrate your work in other school subjects?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes					68.5	50.1	**18.4**	2.49
No	31.4	41.8	-10.4	2.47	31.0	47.4	-16.4	2.48

Over two-thirds (68.5%) of the high-quartile Creating students answered "yes" to this question, as did half (50.1%) of the low-quartile Creating students, giving a margin of 18.4%. This question conjures up issues of self-motivation and application. Does the student apply what s/he has learned in art (or his or her talent in art) in other areas? Apparently, many students in both quartiles do. Talented students may find visual methods help in other academic areas through visual thinking as well as illustrating their final products. Even less-talented students may see opportunities to apply visual methods and illustrations they have learned in art to other areas. Talented students may enhance their work with art; less-talented students may use art to compensate.

Notably, considerably more low quartile students in both Responding and Creating answered that they did not illustrate their work in other school subjects. This is perhaps the more telling interpretation. They are not applying what they have learned in art.

Table 16. SQ00072   Space for teaching visual arts

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Studio w/ equipment	58.9	45.0	13.9	2.55	57.2	39.4	**17.8**	2.54

Among the high quartile Responding and Creating students, around 60% of the spaces used for teaching visual arts are art education rooms specifically equipped for art. For low quartile students, 45% of

the Responding, and 39.4% of the Creating, have studio spaces with equipment. The resulting quartile differences are 13.9% among Responding students, and 17.8% among Creating students. This must be particularly burdensome in terms of creating art because space dedicated for art and equipped for art is so necessary. Clearly, the high quartile students are at an advantage over their low quartile peers in terms of facilities and equipment.

Table 17. SQ00124   Characterize morale of teachers

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Very positive					64.0	48.2	15.8	2.53
Somewhat positive					26.8	44.4	**-17.6**	2.43

This question is contained in the school questionnaire, and appears to apply to all the teachers in a given school, not just to the art teachers. It reflects the overall teacher morale of the school. It is particularly salient because it reverses so radically. Over 90% of the high quartile is distributed between "somewhat positive" (26.8%) and "very positive" (64.0%). Ninety-two percent of the "low quartile" are also contained in these two ranks. That is to say, the other two ranks, "somewhat negative" and "very negative," account for less than 10% of the teachers.

Low quartiles students in schools with "very positive" morale teachers and "somewhat positive" morale teachers are about the same, 48.2% and 44.4%, respectively. However, high quartile students in schools with "very positive" morale teachers shift radically from high quartile students in schools with "somewhat positive" morale teachers, from 64.0% to 26.8%, respectively. The resulting differences between the high and low quartiles from "very positive" and "somewhat positive" plummets from a positive 15.8% to a negative – 17.6%, a shift of over 33%. The shift from "very positive" to "somewhat positive" may seem relatively minor, but apparently it has major ramifications for students and teachers alike. Dedicated, conscientious, enthusiastic teachers who are willing to extend themselves in time, effort and caring can have a tremendous effect in the lives of their students. Competent teachers who "work to the contract" may instruct sufficiently but not break through to a level where their students achieve at their highest level.

Table 18. BV00005   I like to show my artwork to others

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Disagree					30.8	48.2	**-17.6**	2.48

This is an attitude question. It is an example of where a negative answer option ("Disagree") should be interpreted positively. Essentially, more (48.2%) of the low quartile students disagreed with the statement, "I like to show my artwork to others," than did high quartile students (30.8%). That is, more low quartile students than high quartile students do not like to show their art. This might be expected for both groups.

Table 19. BV00007   Taking art now or in the past year

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	55.2	39.4	15.8	2.54	55.0	37.7	**17.3**	2.53

This is perhaps the most revealing question in the entire study. Slightly over half (55%) of the high quartile students and about 38% of the low quartile students were presently taking art or had taken art in the past year. Or, to state it another way, nearly or over half of the students tested were **not** taking art now or in the past year. Students for the 1997 NAEP visual arts assessment were selected from intact classrooms, but not art classrooms. Consequently, many students who were not taking art were tested.

The differences between the Responding quartiles was 15.8%, and between the Creating quartiles, 17.3%. In both cases, the high quartile students outstripped the low quartile students, as might be expected.

Table 20. SQ00122   To what degree is student misbehavior in class a problem?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Moderate Problem					21.2	38.2	**-17.0**	2.31

A greater percentage (38.2%) of student misbehavior, resulting in a "moderate problem" level, existed among the low quartile Creating students than among the high quartile creating students (26.8%), by a negative margin of - 17.0%. There is likely to be more disruptive behavior among students who are not achieving at a high level. High achieving students tend to channel their energy toward productive ends.

Table 21. SQ00117   To what degree is the lack of parental involvement a problem?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Not a Problem					30.1	13.3	**16.8**	2.08

Parents can have a very positive influence on student achievement and success (Becher, 1986; Eccles & Harold, 1996; Henderson, 1987, Peterson, 1989; Scribner, Young, & Pedroza, 1999; Simich-Dungeon, 1986). Their involvement in school affairs, interaction with teachers and administrators, and attention to their children's academic work and attitude is very important. This question is stated negatively: it assumes a problem. But the answer option ("not a problem") obviates the negative statement. Therefore, the positive 16.8% margin between the high quartile Creating students (30.1%) and the low quartile Creating students (13.3%) should be interpreted positively: there is no problem with parental involvement among high quartile students.

Table 22. SQ00107   Parents participate in open house

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
51% - 75%					47.7	32.0	15.7	2.49
26% - 50%	23.0	39.4	**-16.4**	2.16				
0% - 25%					3.3	18.2	-14.9	1.55

This is a most interesting question. In schools where a large percentage (51% - 75%) of parents participate in open house, there is a positive difference (15.7%) between the high quartile Creating students (47.7%) relative to the low quartile Creating students (32.0%). Where a smaller percentage (26% - 50%) of parents participate, there is a negative relationship: the low quartile Responding students (39.4%) exceeds the high quartile responding students (23.0%) by 16.4%. Further, where open house is attended by a low percentage of parents (0% - 25%), the percentage of low quartile Creating students is 18.2%, while the high quartile Creating students is only 3.3%.

Therefore, a large percentage of parents participate in open house where high quartile students outnumber low quartile students. And fewer parents participate in open house where low quartile students outnumber high quartile students. Parent participation could contribute to higher achievement in several ways. It shows students their parents are interested in them and their academic achievement. It creates communication between parents, teachers and administrators. The parents have a better idea of what is going on in the schools.

Table 23. BV00008   Art Class: Paint or Draw

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Every day					39.3	23.4	**15.9**	2.36
Never or hardly ever					14.2	26.6	-13.4	2.05

"Art class: Paint or draw" offers another example of polarized opposites. Where students have frequent opportunities to paint and draw, the high quartile Creating students surpass their low quartile Creating counterparts by 15.9%. Where there is "never or hardly ever" an opportunity for studio experiences, the low quartile Creating students outnumber their high quartile peers by a margin of 13.4%. Although both low quartiles hover around 25%, the *difference* between the two high quartiles is 25.1%. The overall shift between the quartile differences is 29.3% (15.9% to – 13.4%). Frequent studio experiences obviously lead to creative experiences (and creative expression requires studio experiences). A dearth of studio experiences starves creative output.

Table 24. SQ00108   Parents participate in teacher conferences

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
51% - 75%	22.7	36.0	**-15.8**	2.33				
76% - 100%	33.9	21.5	12.4	2.28	36.7	21.1	15.6	2.30

Students benefit directly and substantially where parents take an active interest and role in their education. In this case, parent participation is high for two answer options, 51% - 75% and 76% - 100%. Where parent participation is only 51% - 75%, there is a negative disparity of –15.8% between the high- and low Responding quartiles. Where parent participation climbs to 76% - 100%, this relationship reverses to a positive 12.4%. The overall shift between the differences is 28.2%, that is, from –15.8% to 12.4%.

Table 25. SQ00021   District or state has a visual arts curriculum

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	54.7	70.6	**-15.7**	2.64				

This variable is an anomaly. It is the only instance where a negative relationship exists for a positive question and answer. The low quartile Responding percentage (70.6%) is 15.7% greater than the high quartile Responding percentage. One is lead to believe programs with access to (and presumably influenced by) district and state visual arts curricula produce lower score results among Responding students. This is not likely.

Districts without visual arts curricula are more likely to be small and located in rural areas. They may have very small art staffs and may be lacking visual arts supervisors. Conversely, district with visual arts curricula may be located in urban areas where overall academic achievement is lower. However, these speculations cannot be interpreted from this data.

Table 26. BV00003   I think I have talent in art

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Agree					39.0	24.1	14.9	2.37
Disagree					26.6	41.9	**-15.3**	2.41

"I think I have talent in art" is an attitude question. Table 27 shows the percentages reverse almost exactly from the high quartile to the low quartile. In the high quartile, 39.0% agree with the statement while 26.6% disagree. The opposite occurs in the low quartile: 24.1% agree and 41.9% disagree. The result is an overall shift of 30.2% from a positive difference between the high and low quartiles of 14.9% ("agree") to a negative difference between the quartiles of – 15.3 ("disagree").

Attitude contributes a great deal to art making. A person who believes he or she has talent is more likely to be self-motivated, believe in his or her own ability to initiate and follow through successfully on making art, and have the desire to express himself or herself artistically.

Table 27. BV00016   How often does your teacher exhibit your art?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Once or twice a year	29.5	17.6	11.9	2.17	30.3	15.7	**14.6**	2.14
Never or hardly ever	51.4	63.3	-11.9	2.53	52.2	64.9	-12.7	2.52

I consider this question to be one of the most salient in the entire study because it is an area that art teachers can readily and immediately effect. Exhibiting art "once or twice a year" is minimal. It probably reflects the perfunctory annual art show. However, it seems to have a robust effect. The high Creating quartile is 30.3%; the low Creating quartile is 15.7%. The difference between the quartiles is 14.6%, nearly *double* the low quartile. The overall shift between the Creating differences (HiQ – LoQ) is 27.3%.

Over half (52.2%) of the high quartile Creating students and nearly two-thirds of the low quartile Creating students "never or hardly ever" exhibit their art. Among the Responding students, the same pattern holds. Those who exhibit "once or twice a year" represent 29.5 of the high quartile, and 17.6% of the low quartile, giving a positive 11.9%. That percentage reverses among Responding students who "never or hardly ever" exhibit. Over half (51.4%) of the Responding high quartile rarely exhibit, and 63.3% of the Responding low quartile rarely exhibit. The overall shift between the Responding differences (HiQ – LoQ) is 23.8%.

Table 28. BV00019   Does your teacher save your artwork in a portfolio?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes					56.1	41.5	**14.6**	2.55

Over half (56.1%) of teachers' of high quartile Creating students, as opposed to 41.5% of low quartile Creating students, save their artwork in portfolios, resulting in a positive margin of 14.6%. Saving artwork in portfolios accomplishes several things: it allows both the teacher and student to follow artistic development over time, it preserves a wider variety and number of works than usually survive otherwise, it fosters interaction and opportunities for praise and instruction between the teacher and student, and it serves as a database for assessment. While time-consuming, portfolios infuse a reflective dimension into the artistic milieu. Today, portfolios contain writing, video, electronic-based media as well as works of art.

Table 29. SQ00076   In the last year, any visiting visual artists?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	39.2	25.2	**13.7**	2.39				

Walker (2001) states,

> As a pedagogical practice, arranging for students to interview local artists can be a way to help them associate art with their lived experiences, to counterbalance the stereotypes in textbooks and media images, and to learn about their local history and recognize the strength of their culture. (p. 264)

Meeting artists either as guests in the schools or in their own studios affords students opportunities to ask questions, express opinions, be exposed to contemporary thinking in aesthetics and art making, as well as seeing artists as living role models. There is a positive relation between the high- and low quartile Responding groups regarding visiting visual artists. One can readily understand how students who converse with practicing artists would have an advantage on the Responding portion of the NAEP visual arts assessment.

Table 30. B000019   How often do you use a computer at home for homework?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
No computer at home	19.7	31.6	-11.9	2.53	21.4	35.1	**-13.7**	2.29
1-2 times a month					24.2	11.8	12.4	1.95
1-2 times a week	25.1	14.1	11.0	2.02				

Technology is increasingly important in all aspects of education, including art. Art students use computers to research art history and art criticism assignments on the internet, as well as executing actual works of art. While B000019 is a general question and does not ask the student how often he or she uses a computer at home for *art* homework, it is nonetheless relevant.

When no computer was available at home, both low quartile Creating and Responding students were at a disadvantage compared to their high quartile peers. Among the students who used computers at home for schoolwork "once or twice a month," or "once or twice a week," the high quartile students reversed that negative condition and displayed a definite advantage to about the same degree.

Table 31. SQ00009   Computers available in classroom

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
No, not available	72.0	58.5	**13.5**	2.43				

In this case, the difference between the quartiles appears anomalous. While we assume the question refers to classrooms in general (and not artrooms in particular), these percentages of computers not available in the classroom seems quite high in both cases. Nearly three-quarters (72%) of the classrooms associated with high quartile Responding students, and nearly sixty percent (58.5%) of the classrooms where low quartile Responding students work do not have computers upon which to work available to them. While the resulting quartile difference is positive 13.5%, it is saying fewer computers are associated with higher responding scores. This is most curious considering the much greater (Internet) resources computers make available.

Table 32. BO00016   How many times in the last two years have you changed schools <u>and moved</u>?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
None	79.5	66.0	**13.5**	2.27	78.9	68.5	10.4	2.25

Table 33. B000017
How many times in the last two years have you changed schools without moving?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
None	82.1	70.6	11.5	2.17				

B000016 and B000017 are very related questions, and presented together here. They both ask, "How many times in the last two years have you changed schools?" The distinction between them is B000016 asks if the student *moved* to another home within or outside the school district in the process, while B000017 inquires about school changes made *without moving*.

Stability in one's life is essential for one's well being, let alone creative achievement. Regarding B000016, four-fifths (79.5) of the high quartile Responding students versus two-thirds (66.0) of the low quartile Responding students had not moved in the previous two years, resulting in a positive percentage of 13.5% for the high quartile. Among the students in the Creating quartile, the percentage was 10.4%. Both quartiles were relatively stable in migrating to new schools.

Notably B000017: "How many times in the last two year have you changed schools *but not moved,* yielded a similar result. 82.1% of high quartile Responding students versus 70.6% of the low quartile Responding students said they had changed schools but not moved, yielding a difference of 11.5%. This was repeating among the Creating students.

Table 34. SQ00112   Is student absenteeism a problem?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Not a problem	17.4	30.9	**-13.5**	2.18				
Moderate problem	34.7	23.8	10.9	2.33				

Table 35. BO00014   Number of school days missed this month

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
None	47.4	36.7	10.7	2.53				

Table 36. SQ00128   Percentage of students absent on a given day

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
0% - 2%	23.3	13.2	10.1	1.97				

Three questions referring to attendance and absenteeism, SQ000112: "Is student absenteeism a problem?," B000014: "Number of schools days missed this month," and SQ00128: "Percentage of students absent on a given day," are related, and shown here in Tables 35, 36, and 37, respectively.

Student absenteeism was apparently more of a problem among the high quartile Responding students than among the low quartile Responding students. When schools answered the question, 17.4% of the high quartile were "not a problem," whereas a greater percentage (30.9%) of the low quartile were "not a problem." In other words, the low quartile Responding students attended school more regularly and missed fewer days than high quartile Responding students. This was reiterated by a 10.9% disparity of a "moderate problem" in greater absenteeism among high quartile Responding students than among their low quartile Responding counterparts.

For BO00014: "Number of school days missed this month:" (None), nearly half (47.4%) of the high quartile Creating students reported missing no days, and over a third (36.7%) of the low quartile Creating students reported the same. The difference between these quartiles is 10.7%, in favor of the high quartile.

SQ00128: "Percentage of students absent on a given day:" (0% - 2%), indicates more high quartile responding students fall into this lowest range (23.3%) than low quartile responding students (13.2%). The difference is 10.1%. Larger percentages of students are absent on any given day but the differences between their quartiles is less than 10%.

Table 37. SQ00113   To what degree are physical conflicts a problem?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Moderate problem					16.7	28.9	-12.2	2.14
Minor problem	49.6	63.1	**-13.5**	2.55				
Not a problem	27.4	14.5	12.9	2.08				

Regrettably, physical conflicts are a normal part of middle school life. This question indicates that both low quartile Responding and Creating students engage in more physical conflicts than their high quartile peers. Among Creating students, low quartile students (28.9%) display more physical conflict than high quartile students (16.7%), a large difference of – 12.2%. This was echoed among Responding students where nearly two-thirds (63.1%) of the low quartile Responding students got into physical conflicts compared to half (49.6%) of the high quartile Responding students, a margin of – 13.5. Where physical

conflicts were "not a problem," the difference between the quartiles is 12.9%, which is consistent with – 13.5% (minor problem) and – 12.2% (moderate problem).

Table 38. SQ00083   In last year, any sponsored artists' programs?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	26.6	13.7	12.9	2.04	29.4	16.0	**13.4**	2.13

The quartile differences between both the Responding and Creating groups for sponsored artists' programs are profound. Although the percentages are relatively small, both high quartile Responding (26.6%) and Creating (29.4%) are nearly *double* low quartile Responding (13.7%) and Creating (16.0%). While sponsored artists' programs are present in less that a third of the schools, even in the best of cases, their impact on students appears to be well worth the effort and expense.

Table 39. SQ00127   Characterize regard for school property

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Very positive	26.5	39.9	**-13.4**	2.41				

The indication here is that Responding students in the low quartile have a much higher regard for school property than Responding students in the high quartile. On the school questionnaire, 39.9% of the schools associated with students in the low quartile characterized student regard for school property as "very positive," compared to only 26.5% of the schools associated with high quartile students. This is an intriguing but unexplained relationship.

Table 40. SQ00114   To what degree is teacher absenteeism a problem?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Minor problem	34.4	47.6	**-13.2**	2.54				

Teacher absenteeism, like student absenteeism, is a minor problem. About half (47.6%) of the low quartile students' teachers partake in occasional absences, although only a third (34.4%) of the high quartile students' teachers exhibit similar behavior. On the face of it, the high quartile students' teachers appear to be somewhat more conscientious.

Table 41. BV00001   I like to look at art

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Agree	65.0	52.6	12.4	2.52	64.6	51.5	**13.1**	2.52

The high- and low Responding and Creating quartiles were very similar for this variable, and yielded similar margins, 12.4% and 13.1%, respectively. The high quartiles for both Responding and Creating were in the 65% range, and the low quartile for both Responding and Creating were in around 51%. This suggests that students in both quartiles enjoy looking at art, probably in books as well as actual objects. Art teachers might capitalize on this interest by making visuals accessible through books, slides, transparencies, reproductions, over the internet, or ideally, through field trips to museums and galleries. Looking at art is the first step to talking about art.

Table 42. SQ00121   To what degree is gang activity a problem?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Moderate problem					5.4	18.3	**-12.9**	1.63
Minor problem					43.9	32.9	11.0	2.49

The scope of gang activity is relevant here. Where it is a "moderate problem," the percentages are 5.4% for schools associated with the high quartile Creating students and 18.3% for schools associated with the low quartile Creating students. The incidence of gang activity *triples* between the two quartiles.

However, where it is a "minor problem," there is more gang activity overall. A larger percentage of schools associated with high quartile Creating students (43.9%) consider gang activity a minor problem, whereas the percentage drops to 32.9% in schools associated with low quartile Creating students. In other words, there is more gang activity where it is only a "minor problem," and low quartile students are comparatively less involved. There appears to be a tradeoff here between the intensity of the problem and the magnitude of the problem.

Table 43. BO00011   How much TV do you usually watch each day?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Six hours or more					10.1	22.7	**-12.6**	1.88

Six hours or more of television a day cannot benefit a student academically or artistically. Indulging in television watching for half of one's waking hours surely detracts from every other aspect of life, including making art. Only 10.1% of the high quartile Creating students, in comparison to 22.7% of the low quartile Creating students, engaged in watching six or more hours of TV daily. This resulted in a negative difference of − 12.6% between the two quartiles. Twice as many low quartile Creating students watched six or more hours daily.

Table 44. BO00022   How much education do you expect to receive?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Finish grad school	18.6	6.1	**12.5**	1.66				
Finish college					58.4	48.0	10.4	2.56
Finish high school					1.8	12.5	-10.7	1.30

Three times as many high quartile Responding students (18.6%) expect to complete graduate school as low quartile Responding students (6.1%). A much higher percentage of both high quartile Creating students (58.4) and low quartile Creating students (48.0) expect to earn a baccalaureate degree. Very few high quartile Creating students (1.8%) and low quartile Creating students (12.5%) expected to only finish high school.

Academic ambition and attainment seem consistent with other academic indicators such as BO00021: "What best describes your grades since 6th grade," and SQ00125: "Characterize students' attitudes toward academic achievement."

Table 45. SQ00062   Full-time art specialist teaches 8th grade art

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	81.8	69.3	**12.5**	2.19				

Most art is taught by full-time art specialists. While there was a 12.5% disparity between the high- and low quartiles in this area, 81.8% of the high quartile Responding students were taught by a full-time art specialist, and 69.3% of the low quartile Responding students were as well. Well-trained, dedicated, certified full-time art teachers are essential for excellent art education.

Table 46. SQ00132   Percentage of teachers who left before the end of the school year

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
0%	53.1	65.6	**-12.4**	2.50				

There were more schools associated with lower quartile Responding students (65.5%) that had no teachers leave before the end of the school year, than schools associated with high quartile Responding students (53.1%). In this case, "teachers" undoubtedly refers to all the teachers in the school, not just the art teachers. Teachers may leave school in the middle of the year for many reasons: illness, death, relocation, etc. It is difficult to ascertain what reasons contribute to this question.

Table 47. SQ00125   Characterize students' attitudes toward academic achievement

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Very positive	39.2	28.6	10.6	2.43	41.1	28.9	**12.2**	2.44

On the school questionnaire, 41.1% of the high quartile Creating students were characterized as "very positive" attitudes towards academic achievement, as opposed to 28.9% of the low quartile Creating students. The difference between the quartiles is 12.2%, a large margin over the low quartile.

Nearly the same percentages appear for the Responding students. 39.2% of the high quartile Responding students were described as having "very positive" attitudes toward academic achievement, versus 28.6% for the low quartile Responding students. This produces a difference between the quartiles of 10.6%. Very positive attitudes toward academic achievement may be expected among high achievers.

Table 48. BV00012   Art class: Talk with others about your art

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Never or hardly ever					44.8	56.8	**-12.0**	2.56

A comprehensive art education requires regular opportunities to participate in discussion of art criticism, art history and aesthetics. Talking about one's own art, the art of one's peers, and famous works of art are important functions of art education. Over half (56.8%) of the low quartile Creating students were "never or rarely ever" able to discuss their art with others, while only 44.8% of the high quartile creating students were limited in this way. The result was a negative disparity of – 12.0%. While this

remains a very large percentage for both groups, those who were less hindered presumably had more opportunities to talk about art.

Table 49. BV00032   Not for school: Keep an art journal or sketchbook

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes					34.2	23.3	**11.9**	2.30

Journals and sketchbooks are a traditional mainstay of artists. They record visual notes and ideas in a continuous and spontaneous fashion. They place value in their visual journaling. Over a third (34.2%) of the high quartile Creating students maintained an art journal or sketchbook outside of school, while less than a quarter (23.3%) of low quartile Creating student pursued a similar habit. Art teachers can do much to encourage art journaling and sketching by expressing interest in the students' sketches, role-modeling the use of sketchbooks in their own artistic lives, and setting provocative sketching assignments.

Table 50. BV00022   Not for school: go to an art museum or exhibit

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	30.7	19.0	**11.7**	2.21				

30.7% of the high quartile Responding students indicated they go to art museums and exhibits on their own time, in comparison to 19.0% of the low quartile Responding students. The difference between these quartiles is 11.7%, a more than 50% increase over the low quartile. This activity is bound to pay off in one's ability to respond to art in sensitive, perceptive and articulate ways.

Table 51. BO00013   How often do you read for fun on your own?

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Never or hardly ever	20.9	32.1	**-11.2**	2.26				

One of the saddest findings in the 1997 NAEP visual art assessment is how many students "never or hardly ever" read for fun on their own. Over a fifth (20.5%) of the high quartile Responding students, and nearly a third (32.1%) of the low quartile Responding students, neglect this fundamental activity. The

negative difference between the quartiles (-11.2%) indicates more low quartile students read less than their high quartile peers, but both quartiles are far too high.

Table 52. SQ00026   8th grade visual art field trip last year

	RESPONDING				CREATING			
	HiQ	LoQ	HiQ – LoQ	M/E	HiQ	LoQ	HiQ – LoQ	M/E
Yes	30.9	41.1	**-10.2**	2.46				

Over thirty percent (30.9%) of the high quartile Responding students and over forty percent of the low quartile Responding students (41.1%) were able to go on at least one visual arts field trip in the previous year. This is a curious anomaly where a greater percentage of low quartile students received a special opportunity. Why this relation resulted is not apparent.

Interpretation of the Data

Quartile analysis dramatizes data by comparing the highest quartile to the lowest. Where the differences between the quartiles are greatest, the most salient features of the data are likely to be found. In this quartile analysis, 108 variables were analyzed in relation to student scores on responding tests and creating tasks. Twenty-five variables were taken from the background survey, 32 from the student survey, and 51 from the school survey.

Several answer options or evaluative ranks were usually available within each of the variables, producing a total of 314 factors, and when low quartiles were subtracted from their corresponding high quartiles, 314 differences (HiQ – LoQ), to be analyzed.

The overall question to be addressed is, "What factors contribute to student achievement in the visual arts, and to what degree?" "How" and "why" are obvious correlaries to the basic question.

Some factors are extrinsic to student achievement. They obviously contribute to achievement, but they are beyond the influence of the school and the teacher. These include race, home environment, family background, stability and security, and other socioeconomic factors. Other factors are intrinsic to the student himself. These include attitude, motivation, and expectations. Teachers and schools may affect intrinsic factors to some degree but, ultimately, they are up to the student. There are just a few factors left to teachers and schools by which they may mold students into productive (and artistic) citizens.

Variables Related to Students

Judith Burton (2000) eloquently discusses the student's attitude in relation to achievement in art:

> We have treated young people as the objects of education rather than the
> participants in a shared experience, involving exchanges between young
> and old, experienced and inexperienced. In losing sight of the needs of
> the learner, we may also have lost sight of the significance of learning in
> and through the arts. For the kinds of visual narratives youngsters
> construct not only make meaningful their own sense of self, but also

establish a continuity between their personal lives and the experiences
they share with others. It could be, thus, that in losing sight of the learner
we have also abandoned the belief that the construction of meaning in
visual form is a fundamental feature of being human and that art itself is a
normative function of the human mind. (pp. 330-331)

Seventeen (36.9%) of the variables under consideration are directly related to individual students. They range from academic achievement to attitude to behavior. The variable that showed the greatest disparity between the high- and low quartiles was "Grades since 6th grade." The high quartile averaged 27.8% more A-averages than the low quartile. This is echoed by "Attitude toward academic achievement," where a small (12.2%) but positive inclination surfaced. The high quartile students also indicated a greater expectation of graduating from college than their low quartile peers. Few of the high quartile students were repeating 8th grade, compared to the low quartile, as reflected in SQ00131.

Several variables related directed to a positive attitude toward art. Three of the highest factors, "Not for school," "I like to make art" (24.3%), "People say I am a good artist" (-23.5/disagree), "I like to do artwork" (21.5%), and "I like to look at art" (13.1%), show quartile differences of more than 20%. Clearly, a healthy self-esteem toward one's own artistic ability and interest in art undergirds the motivation to make art, talk about art, and seek it out. Moreover, fewer high quartile students disagreed with the statement, "I like to show my art" (-17.6%), or the statement, "I think I have talent in art" (-15.3%), which can therefore be interpreted positively.

The high quartile students' attitudes seem to have borne fruit. More of them illustrate their work in other subjects with art (18.4%), go to museums and art exhibitions on their own (11.7%), watch less TV (-12.6%), and read more (-11.2%). In addition, the high quartile students' seem to have better behavior. Their "Misbehavior in school" is less than their low quartile friends by -17.0%. They have "Less absences from school" (-13.5%), "Less physical conflicts" (-13.5%), and "Less serious involvement in gang activity" (-12.9).

Art can motivate, build self-esteem, elicit praise from others, give purpose to personal time, and of course, create beauty. Positive, productive attitudes toward art and academic achievement should be a fundamental goal in art education.

Variables Related to Teachers

Several factors that teachers can readily apply in their teaching presented themselves. Teachers can consciously and consistently try to develop their students' self-esteem (cited above) in art through interesting assignments, conversations, praise, and venues where their work may be seen by others. Ryan and Patrick (2001) concluded in their study on middle school social environment and motivation and engagement,

When students believe that are encouraged to know, interact with, and
help classmates during lessons; when they view their classroom as one
where students and their ideas are respected and not belittled; when
students perceive their teacher as understanding and supportive; and when
they feel their teacher does not publicly identify students' relative

performance, they tend to engage in more adaptive patterns of learning
than would have been predicted from their reports the previous year.
(p. 456)

Having regular opportunities to make art is very important. The high quartile students reported 15.9% greater access to "Making art every day than the low quartile students."

Some instructional methods are immediately available to teachers. They can "Save student work in a portfolio" (and talk about it with the student on a regular basis), "Encourage students to keep an art journal or sketchbook" (and talk with them about it on a regular basis), and "Discuss student art in class."

Some instruction requires elaborate preparation but is well worth it. Students in the high quartile have more "Visiting artists" (13.7%), "Sponsored artists" (13.4%), "Access to technology" (13.5%), and "Field trips" than their low quartile counterparts.

Teachers can encourage administrators to offer art to more students, and to increase the percent of the school population who are required to take art. Teachers should lobby for a well-equipped, well-stocked specifically-designed art room with electronic technology available to them and their students. Art teachers should be well-trained, certified art specialists.

Teacher morale is an important factor. Where teacher morale was "very positive," 64.0% of the students were in the high quartile. Where teachers morale was merely "somewhat positive," the percentage of high quartile students dropped to 26.8%. The low quartile students remained about the same (in the mid-40% range) for both groups. Absenteeism among teachers is less of a problem where high quartile students are present.

Parents have an enormous influence on their children. Working with them can reinforce the teacher's instruction and the school's goals. Among high quartile students, parent involvement was 16.8% greater than with low quartile students' parents, and 15.6% greater when parents were actively involved in parent/teacher conferences. When parents attend open house, there is a positive effect as well. Teachers should cultivate relationships with parents in which parents support the art program and the students within it, thereby contributing to the students' self-esteem and motivation in art.

Shirley Brice Heath (2001) points out,

> Art exhibitions offer excellent opportunities to invigorate so many of the attitude factors that pervade all students involved in art. They reinforce the students who are already strong, and build up students who need to become stronger. (p. 12)

Variables Related to Parents

Educational literature frequently indicates that parents are the biggest influence in the academic achievement of their children (Coleman, 1975; Coleman et al, 1966; Suter, 2001,). They pass along their attitudes about school and learning, and their expectations about future education, employment and life style. One way or another, students who excel academically probably have been influenced by role models including their parents, and the values professed from their parents. Feuerstein (2000) stated that "while it may be difficult to stimulate parent involvement in their children's education, it is not impossible" (p. 37). He enumerates important parental involvement indicators such as talking with the child about school, volunteering at the school, parental expectation, working with the PTO, and helping the child make school-related decisions.

Parental involves often requires an activist approach initiated and maintained by the school. With respect to migrant families, who children have a high dropout rate and frequently change schools, Lopez,

Scribner and Mahitivanichcha (2001, p. 279) concluded that migrant schools serve as social settings for the parents as well as the children.

This analysis found five strong factors dealing with parents and home environment. Home environment synthesized four factors involving reading material in the home. Home environment showed a 22.0% difference between the high- and low quartiles. Parent education brings together two factors, father's education and mother's education. Parent education is equally robust in its difference between the quartiles (20.5%). While parent education cannot be changed in most cases, the quality and quantity of reading material in the home (as indicated by home environment) might be ameliorated.

Three other factors showed decided importance. Parent involvement in school was a positive 16.8% between the quartiles, while participation in teacher conferences was nearly as strong at 15.6%. Parent participation in open house was about strongest among the low quartile where fewer parents (26%-50%) attended (-16.4), but shifted markedly to a positive percentage (15.7%) where a higher percentage (51%-75%) of parents attended.

When parents show a supportive, helpful attitude toward their children's interests, children respond positively. Parents can get involved with their school's art programs, just as they do with band and sports. They can help with museum field trips, and raising funds to bring in visiting artists and sponsored artists. They can take their children to museums. They can encourage reading and discourage excessive television watching. Most of all, they can encourage their children to make art.

Variables Related to Administrators

Administrators set the tone of their schools. Their policies regarding student conduct, appearance, demeanor do much to shape the character of the school as well as the character of those attending it. Several variables over which administrators have jurisdiction (if not control) appeared among the 51 variables.

There was a -22.9% difference between the quartiles regarding Chapter I/Title I. That is to say, 56.9% students in the low quartile were in schools receiving Chapter I/ Title I funding as compared to 34.0% of students in the high quartile.

Several other negatively weighted variables, in which the low quartile was considerably greater the high quartile, manifested themselves. They related to student behavior, about which school administrators usually prescribe clear policies. Student misbehavior was -17.0%, physical conflicts were -13.5%, and gang activity was -12.9%.

Administrators also make choices about funding. Whether the art teacher has a well-equipped, well-stocked room designed and devoted to art, or has computer technology available in her artroom, is within the purview of the school's administrator. In addition, the percentage of students who are enrolled in art class can be an administrator's decision. Administrators can make or break art programs through their active support or their apathetic indifference.

Variables Related to Decision Makers and Policy Makers

Decision makers and policy makers need to be aware of all the foregoing constituencies, students, teachers, parents and administrators, as they consider their strategic goals and decisions. Funding schools so they are able to offer viable programs, paying teachers what they are worth, and involving parents more deeply in their children's education, all contribute to students who wish to learn. Supporting technology in

the art room is wise. Policy makers need to realize the visual arts play an important and necessary part in the comprehensive academic curriculum. In this respect, they need to support and advocate it.

Support of schools and art programs is particularly helpful to raising the morale of teachers. High quartile performance is associated with "very positive" morale among teachers. Support for programs, such as visiting artists, sponsored artists, and field trips would demonstrate commitment and vision regarding the visual arts.

Recommendations

On the basis of the analyses of the high and low quartiles related to the New Responding Variable and the New Creating Variable, and the interpretation of those analyses, I offer six recommendations:

- **Recommendation 1: Recognize academic achievement in the arts.**

  High academic achievement is among the most prominent factors revealed in this quartile analysis. Comparisons of the quartiles indicate strong academic students also achieve highly in art. Art should be recognized and prized for its academic value. It should be valued on student transcripts and calculated as part of the college and university admission process. The strong relation of academic achievement to achievement in art can be seen in students' grades since 6th grade, parents' education, what further education students expect for themselves, and their own attitudes toward academic achievement. Policy makers, in particular, have an obligation to recognize that the role of the visual arts is integral to the overall academic curriculum, and support and advocate it as such.

- **Recommendation 2: Make positive attitudes toward participation and creation in art a priority of art education.**

  Students with very positive attitudes about themselves and their ability and interest in art tend to fulfill their own prophecy for achievement in art. Hidi and Harackiewicz (2000, pp. 151-179) argue that internal interests must be cultivated in order to push beyond immediate, externally-motivated performance goals to intrinsically-motivated mastery goals. We may need to consider to what degree a studio emphasis concentrates on performance goals but does not create sufficient intrinsic motivation to break through to mastery goals. Variables related to positive attitude include, Not for school: make art, "People say I am a good artist," "I like to make art," "I illustrate other subjects with my art," "I like to show my art," "I think I have talent in art," "I like to look at art," "I like to talk about art," and "Not for school: I go to museums." Teachers and school administrators should recognize the essential role personal motivation plays in the artistic process, and make every effort to bolster student self-esteem and positive attitudes regarding their artistic efforts. Parents need to understand how positive attitude and self-esteem function in relation to artistic expression, and be encouraged to support their children's interests in art.

- **Recommendation 3: Encourage students to exhibit their own art.**

  Exhibition offers a largely unexplored but immediate and potentially significant instructional strategy for teachers, schools and parents to bolster students' attitudes involving art, as well as academic achievement. Art teachers spend a great deal of their own time putting up and taking down student artwork (Burton, 2001, p. 144). However, students are rarely included in the exhibition process, and therefore do not benefit cognitively from

it. When students learn to exhibit their own art, their self-esteem and attitude toward art improves because they, their peers and their teachers take their art more seriously. Moreover, exhibition offers an excellent opportunity to involve their parents in their art, the art program, and the school in general.

Several variables in the 1999 NAEP Visual Arts Assessment, including "My art teacher exhibits my art," "I like to talk about art," and "I like to show my art,"point to exhibition as a means for bolstering student self-esteem and positive attitudes about art. Moreover, exhibition is a vehicle that can draw the approbation of peers, other teachers and school administrators, and most importantly, parents. It provides an effective means for parents to see their children's work in the most positive light, understand their interests, and offer their support and praise.

- **Recommendation 4: Actively promote parental involvement in school arts programs and exhibitions.**

   Parental influence is one of the most important factors bearing on student attitudes and achievement. Three variables, "Percentage of parents who attend open house," "Percentage of parents who participate in teacher conferences," and "To what degree is lack of parental involvement a problem" stood out prominently among the variables. Art teachers and school administrators need to cultivate, collaborate and communicate with parents in supporting students' involvement in art. Parents can contribute a great deal to art programs in terms of time for special projects, involvement and providing venues for exhibitions, developing resources such as visiting artists and sponsored artists programs.

- **Recommendation 5: Develop learning and aesthetic experiences beyond the core art program.**

   Programs that extend beyond the traditional boundaries of the art curriculum provide students with the unique experiences they need to really achieve. Meeting and working with practicing artists, going to museums and exhibitions, and experimenting with new media such as computer technology, challenge their creative imaginations and spark their artistic initiatives. Several variables, including "Visiting artists," "Sponsored artists programs," "Field trips" and "Access to technology," were associated considerably more with high achievers in art than with low achievers. Schools and school districts, parents and art teachers, should strive to provide experiences beyond the ordinary and traditional to inspire and challenge their students.

- **Recommendation 6: Bolster teacher morale.**

   Several factors pointed to the importance of teacher morale in the success of students. Very positive teacher morale (versus somewhat positive teacher morale) appears to be a very important factor in student achievement. Teachers who are well-trained and well-prepared to teach, who have the environment and resources necessary to teach to a high level, who have the time and energy to go beyond the conventional expectations, can spur students to very high achievement. However, they need the vision and financial support of school administrators, financial decision makers, and policy makers to bring this to realization.

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Implications for Policies Concerning Artistic Development in Schools

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Issues Related to Educational Partnerships

Patterns of support, identified in all three investigative strands with the 1997 NAEP visual arts data, indicate that student achievement in the arts stems from the interests and resources of the family, from opportunity to learn in art class at school, and extends with structured and unstructured activities made available through arts and community agencies. The web of support necessary to arts learning is strengthened in a full partnership environment, as the student perceives universal merit along with individual value in artistic learning.

The web of influence is crucial; we observed with the NAEP data that students operate in multiple settings, and thus assume multiple identities. They are defined by self, peers, family, community, ethnicity, regionality, and nationality. At home, in art classrooms, out in community settings, and as citizens of a united country, students can explore personal heritages and gain creative outlets while learning about the contributions, values and expressive needs of other people. From artistic involvement students can continue to expand in potential, they can become lifelong learners, and as Cushman (2000) hoped, develop understanding of "our nation's expressive life that accurately conveys the complexity and diversity of America's human and material artistic resources to the world" (p. 9).

The NAEP data did not illuminate a role for business in development of a "creative workforce, one that can think originally, operate collectively, and is better trained to solve complex problems" (The Getty Center for Education in the Arts, 1995, p.3), though the 1997 assessment queried perception of the state of mutual support among parents, schools and arts agencies. In support of the arts, the U.S. Department of Education (DOE) and the National Endowment for the Arts (NEA) have joined forces to foster an even more extended partnerships that include the business sector.

Leadership must continue from the national level. Funds for arts partnerships, distributed through government sources and national arts organizations, ought to be continued in the future with the insights and findings of those projects used to direct policy. As a nation united in a commitment to education for all, the arts provide symbolic, expressive, and cultural manifestations of the importance of each citizen to the whole.

Issues Related to Student Motivation

Student attitudes, gleaned from the art background questionnaire, provide some indication of perception of self as artistically inclined. Information about active engagement in arts activities, also reported by students, provides documented reciprocation with artistic achievement when both perception and engagement are present. Attitude and engagement indicators factored in the secondary analysis of 1997 NAEP visual arts data were

> *"Education in the arts is often more sensitive to the child's immediate interests, emotions, and motivations. Instruction is thus child-centered, and parents, teachers, and so on...encourage the free expression of feelings. In contrast, an emphasis on disciplined work...can be well ordered and arranged to progress in measured and logical steps. Parents, teachers, and the wider community encourage less the playful expression of the student and more the pursuit of long-range goals."*
>
> (Csikszentmihalyi, 1993, pp. 107-108)

significantly related to achievement and each factor provided modest explanations for variance in performance for 8th graders. Hidi and Harackiewicz (2000) describe an interactive relationship among individuals which implicates disposition, field and ideas; they postulate (as have Gardner and Csikszentmihalyi, separately, on a number of occasions) that while interest may be a key to early learning, continued development of proficiency may be reciprocal between situational motivators and personal interest. While intrinsic motivation is known to be a strong impetus in art-making; now opportunity abounds for students to employ artistic gifts in careers. With the burgeoning of technology in the workplace, and with artistic production continuing at an all-time high, the economic feasibility of artistic careers has been greatly enhanced for artistic teens. Moreover, the NAEP locates engagement in all ethnic groups, though some groups experience greater difficulty at the point of entry into artistic activities. When at risk and diverse adolescents take advantage of resources and opportunities, and as they continue to participate in the arts, their general achievement increases over time (see Fiske, 1999).

For 8th grade students with high interest in art and habits of engagement established, the structure of disciplined arts knowledge may be providing deep context for further development in related fields. In addition, placing instructional emphasis on artistic contexts may enhance the utility of students' motivation in art, and make learning more relevant. For students less intrinsically motivated to the visual arts initially, highly engaging/artistically-oriented situations may develop the senses and hone the mind, and enhance expertise in other domains. Our work with the NAEP showed that students did not have to "define" themselves as artists to achieve with arts tasks. For some students, it must have been the NAEP task characteristics that provided engagement–particularly, the vividness, novelty, and self-referential components of creative tasks. Students who engage in reading on their own may also have been advantaged in the assessment.

Student reports of aptitude for school and expectations for college explained over 20% of variance on the NAEP arts assessment. With visual arts achievement, correlations are about one-half of the usual subject area achievement to grades values for 8th graders (see Suter, 2000). NAEP tasks were cognitively demanding and reflected both the visual and verbal literacy of students. Moreover, a comparison of visual arts findings for arts achievement parallels those found in reading and other core subjects. Proponents within the visual arts want to continue high standards for assessments of visual literacy; at the same time, they want to provide equitable opportunities for students to learn about the arts. The sophistication of the NAEP testing may allow both provisions to stand. Investigative work at the task level in the Seigesmund, Diket, and McColloch (2001) NAEP replication study indicates that initiatives such as magnet schools, with strong art foci, reduces the explanatory power of racial and economic indicators on performance as students move through the program. Arts infused schools report "an arts advantage" in demonstrated strategic skills, improved communication and manipulation with complex symbol systems, developed fluency in artistic expression, evidenced multi-model technical expertise, and evidenced imaginative leaps (President's Committee on the Arts and the Humanities and Arts Education Partnership, 1999).

"My own guess is that mechanisms of motivation and attention will turn out to have applicability across the several intellectual spheres. Yet it should be evident...that commitment in one or another intellectual spheres may entail high degrees of motivation or attention, without similar investments being evident in other areas....Thus, even if a general theory of attention or motivation should be forthcoming, it would still have to account for evident differences in the extent to which these vaunted capacities are mobilized in activities representing different intellectual realms."

(Gardner, 1983, p. 286)

Issues Related to the Structure and Process of Education

Classroom Practices

The secondary analysis of the visual arts section of the1997 NAEP Arts Report Card (1999) addresses several issues related to the structure and process of education. First and foremost is supporting visual arts education by providing art teachers with well-equipped, specialized facilities and sufficient material resources to educate their students properly. Enrollment in their classes limited to a reasonable number of students, and teachers' schedules allowing for adequate class preparation time, optimizes effective teaching and learning. Like classrooms of other academic subjects, art facilities equipped with adequate electronic technology, including hardware, software, and infrastructure, make teaching and learning through technology a reasonable possibility and feasible expectation. Likewise, art teachers who receive regular and sufficient training and inservice updates can more fully and effectively utilize the electronic technology available to them.

Coupled with the proactive support of their administration (Colbert, 1994), teachers who work in an environment conducive to creative, artistic work, and who continue to grow as educators themselves, are likely to possess high morale. The secondary analysis of the visual arts section of the *1997 NAEP Arts Report Card* indicated that a "very positive" (versus a merely "somewhat positive") teacher morale is associated with high academic and creative achievement among students. Creating art demands so much more than "right answers" from students; it requires personal initiative, intrinsic motivation, long-term commitment, as well as imagination and creativity. The milieu which makes creative achievement possible requires teachers with robust morale as much as adequate facilities and resources.

Findings from the secondary analysis of the visual arts section of the *1997 NAEP Arts Report Card* suggest that high achievement is facilitated when art programs extend beyond the immediate boundaries of the art room. When art programs provide students with rich, personal experiences, such as first-hand contacts with practicing artists, opportunities to work with visiting artists, and field trips to museums and exhibitions, both the programs and the students flourish. Experiences such as these infuse students with artistic ideas and creative ambition.

Students who performed very well on the tests and tasks prescribed by the visual arts section of the1997 NAEP Arts Assessment generally demonstrated high overall academic achievement as well. Moreover, the assessment showed that consistently positive attitudes of high achievers in the arts bespeaks motivation and task commitment.What students learn in art they are able to apply in other academic areas, and vice versa. When art teachers intentionally make connections to other academic subjects through content and skills, the unique learning strategies found in art can enhance learning in those areas, as well as widen the horizons of art learning.

Academic achievement is strongly associated with increased parental involvement in education (Becher, 1986; Eccles, & Harold, 1996; Epstein, 1986; Henderson, 1987; Hoover-Dempsey, Bassler, & Burrow, 1995; Hobbs et al., 1984; Peterson, 1989, Simich-Dudgeon, 1986). When students perceive their ideas, interests and art are looked upon with interest and approval, their motivation is likely to soar. Parents constitute a powerful, but often underutilized, force with enormous potential to benefit both their own children and the art program. When art teachers regularly communicate their students' artistic achievements to their parents, and actively enlist parents' support in encouraging their children's artistic ambitions and pursuits, the overall likely effect extends the influence and prestige of the art programs, as well as underwrites the achievement of the students.

Working with community organizations, corporate sponsors, and parents, creates cultural capital (Bourdieu, 1990; Ivey, 2001; Putnam, 2001) by strategically expanding the art program beyond the immediate aegis of the art room. Increased appreciation by the wider community may well draw positive recognition and additional support from the school administration. Exhibitions provide an excellent means for communicating the achievements of students as well as of the art program. When students themselves undertake the exhibiting process, they extend their knowledge into wider venue. Moreover, they receive recognition for their work and appreciation of their art which, in turn, contributes directly to their self-esteem and motivation toward art.

"I believe that in response to what we know, we must assert, on behalf of our citizens, a moral claim to art, art-making, heritage and creativity; in other words, we must advance a moral claim to a cultural agenda in order to enhance the lives of young citizens, strengthen communities, bridge the spiritual divide."

(Cushman, 2000, p. 8)

Teachers' Education

In the past decade standards for student learning in all academic areas has received intense attention at the national, state and district levels. Teachers, students, school administrators, parents and policy makers alike are anxiously caught up in the maelstrom of assessments qua accountability.

The quality of a teacher's own education often adumbrates their success as a teacher. The National Art Education Association (1999) has published guidelines for teacher education in the visual arts. The federal government has developed national assessment standards. Many state departments of education have crafted standards to guide art teachers. In just the last decade, the National Board for Professional Teaching Standards (see http://www.nbpts.org) has instituted an initiative to board certify thousands of teachers, including art teachers. When he was president, Bill Clinton called for 100,000 teachers to become board-certified. We are experiencing a period of intense policy change at many levels that directly bears on teacher education, requirements for certification, and expectations for professional development and professional performance.

The primary goal of accountability is to improve the quality of learning. policy makers need to support coherent and reasonable policies regarding standards, assessment and accountability. However, the policies must be genuine, giving to teachers the training, professional development, resources, time and space to do their jobs effectively. It is ingenuous to expect any teacher to teach well, to meet specified standards, to be accountable, if classes are overcrowded or if there is not enough time, facilities, resources and administrative support to teach effectively. Teacher assessment should seek to ameliorate instruction; teacher accountability should emphasize merit. policy makers must be certain their policies are feasible and genuine. Funding for implementation must match expectations of achievement.

"I think it worthwhile to translate research, or rather to organize it into a source of greater understanding for teachers and the larger community, as that would move knowledge and expertise in more directions than otherwise."

(Willinsky, 2001, p. 8)

The findings of our secondary analysis of the NAEP 1999 arts assessment reinforce the position that policy makers should expect instruction in art to be taught by certified specialists, just as they are in other academic fields. A plethora of regulations, tests, academic and legal requirements ensure prospective art teachers are well trained, skilled in both content and pedagogy, and have good character. Prospective art teachers are required to meet many academic and professional criteria to become certified to teach. Such policies are intended to maintain high quality among art teachers, and generally, do.

Like teachers in other subject areas, art teachers are expected to continue their professional development through inservices and training provided by their school districts, or to continue graduate work in their chosen teaching area, in order to maintain their certification.

Access to Arts Education

Perhaps the most pressing policy issue in arts education is access to arts education. While national policy, articulated by Goals 2000 and national art organizations, strongly advocate the arts for every child, the reality, as shown in the NAEP arts data, is that at present too few children receive regular instruction in the visual arts, music, drama or dance. Entrenched policies and traditions as well as patently false notions, such as arts are only for the artistically-interested or talented, still persist at the policy level. Such policies allow the arts to be relegated to the academic periphery, conveniently cutting school expense in the process. policy makers at all levels, national, state and local, must recognize the value of the arts in the lives of all children, and support viable arts education programs at all levels in all schools.

In many states and school districts, at the elementary level, the arts continue to be taught by classroom teachers, not by certified arts specialists. Children produce projects requiring marginal aesthetic thought, little artistic creativity, or questionable problem-solving ability. Such band-aid approaches to the arts miss the fundamental point: the arts provide genuine academic learning in their own right, and should be pursued with as much commitment to children's education as is evidenced in mathematics, reading or science.

Typically at the middle school level, students receive only nine to eighteen weeks of visual art instruction. NAEP school characteristics indicate that art-rich schools are associated with higher achievement. Art education needs knowledgeable advocates among policy makers who can articulate the value and need for the visual arts in the core to their political, budgetary and educational colleagues.

Status of Technology and the Arts

Many art teachers embrace electronic technology whole-heartedly while others view technology with considerable trepidation. Technology has enormous educational potential in the visual arts, just as it does with other subjects. The Internet allows each student access to a virtually unlimited cornucopia of text, sounds and images. A wide variety of age-appropriate software capable of producing visual art in many ersatz media already exists, and more software appears on the market daily. Vendors offer computers each year with exponentially-increasing memories capable of greater artistic sophistication and new peripherals capable of executing art in various media.

> *"The incorporation of interactive hypermedia into the art classroom provides students with greater access to imagery, content and experiences that form those (aesthetic) beliefs.".*
>
> (Prater, 2001, p. 47)

Children often begin school with formidable computer skills, in many cases, exceeding their teachers' computer literacy. Moreover, many children have been raised with computers in their homes. They experience no reticence toward technology and are very receptive to computers as an artistic medium, and the number of technology credits is steadily increasing on high school transcripts (Holloway, 2001, p. 84).

Computers offer teachers great promise for internet research in preparing lessons, new methods of delivering instruction, keeping better records and documentation, and exploring greater artistic expression in art classrooms. On the other hand, many art teachers feel threatened by the new technology. Their own technical knowledge and facility may be limited (Burton, 2000). Within art programs, relatively cheap

technology threatens to eventually displace the more expensive studio art programs which traditionally-trained artist/teachers find exciting and vital. Moreover, non-art technology (such as keyboarding or programming courses) often vies directly with the arts for credits, time, and students.

Of particular note is the potential of electronic technology to significantly increase teacher efficiency. Even this is seen by many as a double-edged sword. While technology could potentially help teachers do more with less and assuage the potential two-million-teacher shortfall looming on the national horizon in the next decade, it could also lead to larger, more narrowly-structured classes with less artistic expression, less creative individuality, and less pedagogical flexibility. Art teachers, who put great store in personal contact with students and (literally) hands-on studio experiences, may find such progress counterproductive and unacceptable.

In the last decade educational technology has made remarkable strides. The International Society for Technology in Education (ISTE) (Thomas, 1998) has established national educational technology standards for students, though notably none of these standards pertain specifically to learning in the arts. Several states have followed suit in establishing technology standards for their schools. Federal, state, and corporate policy and funding have significantly raised the numbers, quality and percentages of electronic technology (primarily computers) available per student, have substantially integrated electronic infrastructure in most schools through the e-rate initiative, and have generally raised the quality of software that is currently available and in use.

The NAEP arts assessment data suggest art teachers and art rooms are under-equipped for technology. The major area lagging behind appears to be teacher training (Burton, 2000; Wirt, 2001). Many school systems are reticent about committing large portions of their budgets to technology that can quickly become obsolete until most teachers have sufficiently mastered technological skills and are willing to use them consistently in their regular instruction. Many school systems currently do not provide sufficient technology inservices and training courses (compared to technology training required in corporations and industry) to bring teachers up to standard (Burton, 2000). Clearly, policy makers must commit many more resources to teacher training in technology and offer incentives if they expect teachers to function beyond a minimal level and embrace technology with fervor.

Issues Related to the Core of Teaching and Learning

Many current school reform initiatives attend to specific aspects at the core of teaching and learning. The foci of some initiatives include achievement standards, curriculum, instruction, assessment, professional development, and program necessities. Each foci represents unique components of the art education milieu. Policies that relate to these components require development or revision in light of the current state of visual arts education.

Achievement Standards

Creation of the national visual arts achievement standards (Music Educators National Conference, 1994) was accomplished concurrently with development of the 1997 Arts Education Assessment Framework (National Assessment Governing Board, 1994). These achievement standards touched off an explosion of curriculum reform at state and local levels. The 1997 NAEP in visual arts was developed shortly after publication of the national achievement standards and the assessment framework. The 1997 NAEP visual arts assessment was designed to be consistent with both of these documents. Student achievement in visual arts, as measured on the 1997 NAEP, thus represented the interlude for publication

of these documents and implementation of the 1997 NAEP in visual arts. Revision of state and local curriculum standards and assessments followed after 1997, and implementation of new standards are still occurring in visual arts classrooms. The state of art education in the United States today has been radically transformed by these changes, and the rippling effects of the national achievement standards and assessment are more ingrained today than in 1997. Policy makers must continue to be vigilant in monitoring curriculum development and assessments. They should promote art education policies that support continuing curriculum and assessment development. They should foster policies that enable visual arts educators to engage in professional development that provides knowledge and skills needed for continuing curriculum and assessment development. Professional organizations and state Departments of Education need to prioritize policies that provide resources needed to achieve these ends. Collaboration among all stakeholders to create polices designed to enhance student learning is essential to future success.

Curriculum Sources

National visual arts achievement standards were designed to reflect the core of learning in the visual arts. They provided theoretical and conceptual structure for learning through the visual arts. Art teachers have reported that local curriculum is aligned with national visual arts standards (Burton, Horowitz, & Abeles, 1999; National Art Education Association, 2001; Sabol, 1998, 1999, 2001). Translating these standards into curriculum content in the form of lesson plans with activities and experiences designed to promote learning in this structure is the role of the local art teacher. However, art teachers in middle schools continue to depend to a high degree upon "their own ideas" for lesson plan content (Sabol, 1998, 1999, 2001). Policies designed to provide teacher access to curriculum design and models, combined with training in use of these models, should be explored. Policies that monitor curriculum development and include support for routine curriculum development and revision should be in place at the state level and in local school districts. Policies that emphasize expansion of the curriculum to include a broader array of methods through which students can learn in the art classroom should be fostered; for example, a need for greater emphasis on reading and writing is supported by findings in The 1997 NAEP Arts Report Card and in studies related to this report.

Assessment

Without question the current interest in assessment has changed the face of education. Designing, implementing, and interpreting results of assessment are ongoing challenges visual arts educators must continue to meet. Understanding the fundamental principles and procedures of assessment is essential in accomplishing this task (Boughton, 1996). Actively seeking new information about assessment procedures and practices can provide direction to development and expansion of assessment efforts. Building assessment programs that are fair and consistent is contingent upon this knowledge (Fairtest Principles and Indicators for Student Assessment Systems, 2000). Visual arts teachers must be given encouragement and support to overcome obstacles to comprehensive assessment of learning in visual arts education. The NAEP arts assessment data indicates that teacher morale is a key component at schools where students are achieving in the arts.

"Quality assessment must rest on strong educational foundations.
These foundations include
1) understanding how students learn;
2) organizing schools to meet the learning needs of all their students;
3) establishing high standards for student learning; and
4) providing equitable and adequate opportunity to learn."

(Fairtest, 2000, p. 6)

Policy makers should evaluate existing assessment policies to determine their relevance and act to revise them or to develop policies that are compatible with current knowledge and practices of assessment. Clear goals for visual arts assessments must be established nationally. These goals must be reflected in visual arts education policies. Formation of assessment goals should be the product of the collaborative efforts of students, art teachers, administrators, parents, school boards, and members of the community. Policy makers must be cautious in interpreting assessment results. They should monitor assessment results and evaluate the meaning of those results as they relate to goals they establish for assessments and alter those goals as the need arises. Policies that promote assessment training for visual arts educators and development of local and state visual arts assessment programs need to be put in place. Policies should be enacted that enable visual arts teachers to use assessment as a broad measure of student achievement rather than using assessments as a road map for charting the future course of visual arts education. Assessment should be viewed as a tool capable of assisting visual arts educators in measuring student achievement and the impact of visual arts education programs, and not as the purpose of visual arts education.

Educational Necessities

Fundamental necessities of education must be met before learning can take place. Visual arts education programs include numerous general and specialized needs. If visual arts teachers and visual arts programs are to be held accountable for achievement of students, these needs must be met. Such necessities may be tangible, including things like facilities, materials, equipment, and supplies. Other necessities may seem less tangible, but these are of equal importance. Administrative support for art education programs, funding, manageable scheduling, and other necessities contribute to providing opportunities for students to learn.

"It is unfair to expect students to meet achievement standards in any discipline unless they are given reasonable opportunities to learn the skills and knowledge specified.
They must be provided with the necessary support by the school, including sufficient courses, staffing, materials, equipment, and facilities."

(Goodwin, 2001, p. 5)

Policies must be established that provide for these educational necessities. Policies that include school and community resources will contribute to providing high quality learning experiences that enable students to develop their visual arts knowledge and skills to the maximum. For those necessities linked to the availability of funds, policies must be developed that include temporary means to overcome financial limitations while instituting sustained funding. Providing human resources necessary to implement quality visual arts education is an essential concern policy makers must address. The NAEP arts assessment data suggest that well-trained and licensed visual arts teachers are essential as providers of quality visual arts education. In light of the anticipated teacher shortage in the coming decade, policy makers must be wary of policies that permit the hiring of underqualified or incompetent individuals to meet staffing needs. Policy makers must be mindful of the role of educational necessities in visual arts education and they must meet the challenge of seeking new and alternative means of providing essentials.

Professional Development

Visual arts teachers not only facilitate learning, they must be engaged in active learning as well. The field of art education is constantly changing. Visual arts teachers must continuously engage in their professional development to keep pace with change. Seeking new information necessary to improve their teaching is of critical importance. Learning about new developments in the general field of education or those specific to visual arts education and how they impact learning can directly affect students'

achievement in the visual arts classroom (Gary, 1997). Indeed, many state Departments of Education now require professional development plans for teacher licensure and certification. The Interstate New Teacher Assessment and Support Consortium (INTASC) (Council of Chief State School Officers, 1995) places emphasis on seeking opportunities to grow professionally. The National Board for Professional Teaching Standards (1996, 2000) requires evidence of ongoing professional development for certification. Progress is being made; the U. S. Department of Education (Carey, Sikes, Foy, & Carpenter, 1995) reported that about half of all public schools or school districts during the 1993-94 school year had offered teachers inservice training or other professional development activities in the arts. In addition, the U. S. Department of Education (2000) stated that as many as 81 percent of full-time public school teachers participated in professional development activities.

> *"...it is unfair to hold teachers accountable for their students' meeting the standards unless they are ensured adequate teaching and preparation time, scheduling, and other necessary conditions for teaching.*
>
> (Goodwin, 2001, p. 5)

Visual arts education policies that encourage and require art teachers' participation in professional development activities should be implemented. These policies should provide support for such activity and include provisions for funding art teachers' participation in them. Efforts should be made by policy makers to identify and provide professional development activities that include appropriate content and that are of interest for visual arts teachers. Rigorous programs like National Board for Professional Teaching Standards certification in visual arts have gained wide acceptance recently and provide an exemplary professional development experience. Some states fund national board certification by salary stipends or certification reimbursement. Policy makers should involve visual arts teachers in creating and selecting professional development opportunities. Policies that provide incentives and recognition for ongoing engagement in professional development will encourage art teachers to participate in professional development and to share professional development experiences with colleagues. Future NAEP assessments could reveal more of teachers' professional development experiences through teacher level questionnaires.

Issues from a National Research Agenda

Research in art education has traditionally been conducted by higher education faculty, and their graduate students, in art education departments at various universities across the nation. In 1995, the National Art Education Association (NAEA) heeded the long-recognized need for a cohesive research policy and established a commission on research in art education (Zimmerman, 1996). The intent of the commission was to take stock of research in art education and to help focus the research pursuits of art educators in higher education, their graduate students, and art teachers interested in research on a few (rather than many) areas for research. These seven areas are demographics, conceptual issues, curriculum, instruction, contextual issues, student learning, and evaluation. Committees were formed, chairs were appointed, briefing papers were published. NAEA announced research foci (such as secondary education, and technology) for specific years, and committed considerable amounts of money to support research in these areas. In the past six years, the research committees have published histories of art educators, built special interest groups (SIGs), and developed presentations at NAEA conventions. Some research projects have been funded and begun.

Recently, Mac Arthur Goodwin, the president of the NAEA, called for a national research strategy in art education. The subtitle of his strategy, "setting an agenda for improving student learning," is telling.

Goodwin (2001) calls upon the NAEA Board of Directors and its constituency groups to commit to, "1) use this organization's (NAEA's) vast resources and intellectual capital to inform arts education practices and policy decisions, and 2) work within and beyond the NAEA infrastructure to improve student learning" (p. 1). With NAEA's leadership and vision, arts education researchers can temper their research in a more systemic fashion, so each individual research project contributes to a more coherent vision of our whole field and its practices. This direction should be complemented by policy at the national and state levels, as well as by more immediate decision makers at the district and school levels.

Issues Related to the Broader Context

The NAEP visual arts assessment revealed the bedrock, rather than the mature accomplishments, of the standards movement within art education. This is exactly what the 1997 NAEP Arts was designed to do; and its designers without doubt must consider this as a report card on a "work in progress." As part of a 1995 international publication on trends and issues in art education, Diket observed the increasing elaboration of art content and purposes and the institutionalization of the arts as part of educational reform (Kauppinen & Diket, 1995). Some colleagues initially resisted the cohesion national assessment represents, believing that performance evaluation relied primarily on the judgment of art teachers and that special needs students could be disadvantaged (National Art Education Association, 1994). Questions were raised about consequences, fairness, generalizability, content, subject area coverage, meaningfulness, costs and efficiency of national assessment. Now, with a second look at the NAEP visual arts, there appears to be growing consensus that nation's report card allows unique reflection upon the impact of artistic experience at a more abstract level of existence and influence. Such reflections inform dialogue about policy within the larger venues of education. Still, the worries of colleagues must be heeded in regards to congruence with local curricula and on matters of inclusion, especially if assessment assumes punitive dimensions for participating schools.

"While we all can agree that the state of the educational health of the nation is important to know, what constitutes such a state of health...is no trivial matter. The domains to be assessed, the way parameters are defined, the kind of information sought, and the manner in which it is sought determine for all practical purposes what will be taken into account in making the diagnosis."

(Eisner, p. 1)

In addition to the 1997 NAEP Arts, arts data has been gathered as part of high school transcript study, forms a component of the early childhood longitudinal study, and can be found embedded in the assessment tasks of other core subjects. These data are available for study under restricted license. Additionally, funding for secondary analysis attracts subject area researchers, demographers, and statisticians into the process. Our findings with the NAEP, far from being contentious, affirm the strength and value of the visual arts as part of the core of subjects the nation's children should learn. However, as is the case in reading, math, science, and other core subjects, student learning in the arts can be improved dramatically as we work with our findings and complete policy initiatives. Through the NAEP lens, we can study long-term trends at the national level, in problem areas such as school violence and as evidence of growing artistic competence which may impact career choices in the workplace.

Standards-based assessments derive from a community of consensus–operating at the national level and tested in local volunteer schools. The broadest appeal is to view assessment as a investigative tool for educational improvement; we look forward to the 2007 arts assessment as it affords longitudinal study of the infusion of national standards and its impact on student learning. The 2007 visual arts assessment

would benefit from the addition of teacher questionnaires so as to study the high turnover expected in teaching staff, along with differences in professional development and pedagogy.

Recent events in our country, horrible in the toll on life and property, tapped deeply the artistic and interpretive potential in America's population. Pattern recognition capability, symbolic awareness, and identity construction undergirded creative responses to the terrorist crisis. Professional arts communities joined in the effort, raising funds and advocating American ideals, even adjusting the timbre and tone of productions away from violence and cruel humor. As artistic sensibility in America awakened to new heights; our citizenry enlarged in its vision and understanding of place within a world culture. The gains will fall away if arts partners do not continue to value diversity as exemplified in the arts and if the learning partners do not actively teach and advocate for cultural understanding.

"Without these tools our children are going to be at sea in a storm of media images without the critical skills they need to digest, deconstruct, analyze and to make final judgments about how image experiences are relevant to their own lives."

(Cecily Truett, quoted by The Getty Center for Education in the Arts, 1995, p. 4)

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Appendix A

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Project Officer
Lead Investigator

Dr. Read Diket is professor of art and education at William Carey College, Hattiesburg, Mississippi. She directs the honors program and Center for Creative Scholars; both programs advocate research as a professional "habit of mind" for participants in the various majors. As a professor with administrative responsibilities in two departments (AHS and Education), she designs and teaches courses in the arts, educational research, and gifted education. Her research interests include the study of and appropriate application of research methods, statistical reasoning, semiotics, neurological findings, and theories of intelligence and creativity to work in the arts and in gifted education. She has received national grants for work with educational technology, statistical analyses in the arts, and developmental trajectories in writing about art. Publications include *Trends in Art Education from Diverse Cultures*, co-authored with Heta Kauppenin and published in 1995, edited journals, book chapters and numerous articles in scholarly journals.

Dr. Diket graduated from the University of Mississippi in 1964 (BAE), from the University of Southern Mississippi in 1987 (MAE), and the University of Georgia in 1991 (Ph.D.). While at the University of Georgia, she was recognized by the university housing authority for outstanding contributions to campus life in providing Saturday arts for the children of international students. Beginning in graduate school, she has maintained an active presence in the National Art Education Association (NAEA), recently serving as president of the Seminar for Research in Art Education (SRAE) and as a member of the NAEA Research Commission. She is a director-elect for the NAEA Southeastern Region, higher education division. As a member of the American Educational Research Association (AERA), Diket has served as chair of Arts and Learning and as incoming chair and current program chair for Neurosciences and Education, both special interest groups. She has presented over 50 papers at national and international conferences, including the International Society for Education Through Art (INSEA), AERA and NAEA, the National Association of Gifted Children (NAGC) and the Council of Exceptional Children (CEC). In work at the state level, she has served on the board of the Mississippi Association for Gifted Children (MAGC) and authored program materials with the Mississippi's Department of Education (MDE). At the college, she has been a leader in accreditation incentives, and been recognized as outstanding faculty in the Humanities and by the Mississippi legislature.

Robert Sabol
Principal Investigator

Dr. Robert Sabol is an associate professor of art and design at Purdue University in West Lafayette, Indiana. He teaches graduate and undergraduate art education courses containing content related to curriculum development and theory, instruction, assessment, gifted and talented education, special needs learners, art appreciation, multiculturalism, and the history of art education. His research interests include curriculum studies, assessment, diversity and multicultural education, urban and rural art education, and education of the gifted and talented in visual arts. He has received grants from local, state, and national agencies in support of his research, and his publication record includes book chapters and articles in scholarly journals.

Before coming to Purdue University, Dr. Sabol was a public school elementary art teacher for 23 years. He completed the doctoral program at Indiana University in 1994. His doctoral research was supported by a Getty Education Institute for the Arts Doctoral Research Fellowship. He was the vice chair of the National Board for Professional Teaching Standards Early Childhood through Middle Childhood/Art Standards Committee, a member of the Indiana Visual Arts Proficiency Guide and Assessment Development committees for the Indiana Department of Education, and a member of the Museum Education Council of the Indianapolis Museum of Art. He was a member of the 1997 National Assessment of Educational Progress Visual Arts Exercise Development Team, Fine Arts Standards Committee of the Indiana Professional Standards Board, and delegate in the Art Education Association of Indiana's Cultural Exchange Program with the University of Joetsu in Joetsu, Japan. He has been the Western Region Elementary Division director of the National Art Education Association and NAEA Delegates Assembly representative from Indiana. He has been president of the Art Education Association of Indiana, a district representative, membership chairperson, and parliamentarian. He serves on other art education related advisory boards and committees and he has given numerous presentations at state and national art education conferences and workshops. Dr. Sabol received the NAEA Western Region Higher Education Division Art Educator of the Year Award in 1999 and previously the Art Education Association of Indiana's Art Educator of the Year, Higher Education Division Art Educator of the Year, and Elementary Art Educator of the Year awards. In recognition of his research and teaching, Dr. Sabol has twice received the Purdue University Department of Visual and Performing Arts Excellence in Education Award.

David Burton
Principal Investigator

Dr. David Burton is an associate professor in the Department of Art Education, School of the Arts, at Virginia Commonwealth University. His education includes a BFA in painting from Syracuse University (1967), a M.A. in art education from New York University (1969), and a Ph.D. in art education from the Pennsylvania State University (1973).

Among the honors he has received, Dr. Burton has been recognized as the National Art Education Association (NAEA) Higher Education Art Educator of the Year (2000-2001), NAEA Southeastern Art Educator of the Year (1998), Virginia Art Education Association (VAEA) Art Educator of the Year (2000-2001), VAEA Higher Education Art Educator of the Year (1997-1998), and Virginia Commonwealth University School of the Arts Distinguished Achievement in Service Award recipient (1997).

Dr. Burton has conducted five demographic surveys since 1991: "How Do We Teach? Results of a National Survey of Instruction in Secondary Education" (*Studies in Art Education*, 2001), "A Survey of Computer and Electronic Technology Used by K-12 Teachers of Art" (*International Journal of Educational Policy, Research & Practice*, 2000), "A Survey of Current Research in Art Education" (*Studies in Art Education*, 1998), "A Survey of Assessment and Evaluation Among U.S. K-12 Teachers of Art" (*Studies in Art Education*, 1998), and "A Survey of Research Interests Among Art Education Researchers" (*Studies in Art Education*, 1991). He has also published chapters on demographics in the *NAEA Briefing Papers* (1996) and the *NAEA Research Status Reports* (1998).

Dr. Burton has presented papers in Sweden (1999), Finland (1994), and Canada (1977). He has presented over 40 papers at national education conventions, and 30 papers at state art education conferences.

Dr. Burton chaired the NAEA Research Task Force for Demographics from 1994 to 1999, and served as the secretary-treasurer of the Seminar for Research in Art Education from 1986 to 1995. He was recently appointed as NAEA Southeastern Region Higher Eduction Director-Elect (2001-2003).

Pamela K. Thorpe
Statistical Consultant

Dr. Pamela K. Thorpe is an assistant professor in the Department of Educational and Counseling Psychology at the University of Missouri-Columbia. Her education includes a B.S. in mathematics from Wichita State University (1987), a M.A. in psychology from the University of Notre Dame (1995), and a Ph.D. in psychology from the University of Notre Dame (1998).

Dr. Thorpe has co-authored an article on motivation in the Journal of Educational Psychology (1998): "Relating students' reports of motivation and negative affect: A theoretical and empirical analysis," and an article on self-regulation and motivation in D. H. Shunk and B. J. Zimmerman (1994): "Self-regulation and motivation: A life-span perspective on underachievement." Dr. Thorpe has presented papers on a hierarchical linear modeling approach toward dynamic assessment of mathematical conceptual learning and a multilevel examination of an emerging university-wide distance education program.