Volume 15, No. 2 Spring 2002

MID-WESTERN EDUCATIONAL RESEARCHER

• Official Publication of the Mid-Western Educational Research Association •

Columbus, Ohio

About the Cover

Located in central Ohio on the banks of the Scioto River, Columbus has grown to become the 15th largest city in the United States. Its vibrant downtown features a variety of entertainment districts, restaurants and hotels. The Arena District, located adjacent to the Greater Columbus Convention Center, is built around the Nationwide Arena, home of the Columbus Blue Jackets, concerts and family events. The Arena District ofers restaurants, nightclubs, the PromoWest Pavilion music house and the Arena Grand Theater movie house. Other downtown districts and neighborhoods include the Short North Arts District, German Village and the Brewery District. The Short North features art galleries, restaurants and pubs, while German Village is the nation's largest privately restored historic nieghborhood. The Brewery District is one of the city's top entertainment districts and features restaurants and several nightclubs that routinely have live music. The downtown is also home to the Ohio Statehouse, which recently underwent an extensive restoration project. For more information about Columbus visit www.SurpriseItsColumbus.com.

Photo courtesy of Rod Berry

Information for Contributors to the Mid-Western Educational Researcher

The *Mid-Western Educational Researcher* accepts research-based manuscripts that would appeal to a wide range of readers. All materials submitted for publication must conform to the language, style, and format of the *Publication Manual of the American Psychological Association*, 4th ed., 1994 (available from Order Department, American Psychological Association, P.O. Box 2710, Hyattsville, MD 20784).

Four copies of the manuscript should be submitted typed double-spaced (including quotations and references) on 8 1/2 x 11 paper. Only words to be italicized should be underlined. Abbreviations and acronyms should be spelled out when first mentioned. Pages should be numbered consecutively, beginning with the page after the title page. Manuscripts should be less than 20 pages long. An abstract of less than 100 words should accompany the manuscript.

The manuscript will receive blind review from at least two professionals with expertise in the area of the manuscript. The author's name, affiliation, mailing address, telephone number, e-mail address (if available), should appear on the title page only. Efforts will be made to keep the review process to less than four months. The editors reserve the right to make minor changes in order to produce a concise and clear article. The authors will be consulted if any major changes are necessary.

Manuscripts should be sent with a cover letter to:

Mary K. Bendixen-Noe, *MWER* Co-Editor
1179 University Dr., The Ohio State University at Newark, Newark, OH 43055

The *Mid-Western Educational Researcher* (ISSN 1056-3997) is published quarterly by the MidWestern Educational Research Association through The Ohio State University. The Summer issue serves as the annual meeting program. Non-profit postage paid at Columbus, Ohio, with permission of the College of Education, Daryl Siedentop, Interim Dean.
POSTMASTER: Send address change to Jean W. Pierce, Dept. EPCSE, Northern Illinois University, DeKalb, IL 60115.

MID-WESTERN EDUCATIONAL RESEARCHER

Volume 15, Number 2 Spring 2002 ISSN 1056-3997

MWER Publication Address

Mary K. Bendixen-Noe
The Ohio State University, Newark
1179 University Dr.
Newark, OH 43055
Phone: (740) 366-9469
Fax: (740) 366-5047
email: bendixen-noe.1@osu.edu

MWER Subscription & MWERA Membership Information

Jean W. Pierce
Dept. EPCSE
Northern Illinois University
DeKalb, IL 60115
Phone: (815) 753-8470
Fax: (815) 753-9250
email: jeanpierce@aol.com

Wanted: MWERA WebMaster

The Mid-Western Educational Research Association (MWERA) is seeking a qualified individual to take over the duties of WebMaster. Currently the association operates an informational web site (http://etra.cedu.niu.edu/MWERA) That serves as a primary point of information concerning the annual meeting. Prospective presenters are able to obtain information about the meeting-in-planning, and to submit presentation proposals electronically over the web. This same system is used by Division Chairs and reviewers in considering submitted proposals, and by the Program Chair in planning the entire program. Once the meeting program is complete the web site is updated to present a complete and searchable program, including information about invited speakers and the host city, to prospective attendees. In addition, the association web site provides basic information about the association, its officers, and other goings on. Year-round functionality is expected, with peak work times occurring in late Spring and early Summer (as submissions for the program are reviewed and program is planned), then again in mid-to late-Summer (as the program is finalized).

The WebMaster is responsible for operating and maintaining the web site, including adding new features and functionality as desired by the Board, Council and membership. Qualifications would include a good knowledge of HTML and web server operation, including the use of dynamic pages driven by a back-end database, on a dedicated Dell computer with 196Mb of RAM, 9 Gb of fast SCSI hard disk, and a 10Mbit Ethernet connection to the Internet. The current web site operates on a Windows XP Professional operating system computer running Microsoft's IIS web server software. The pages were designed in Microsoft FrontPage XP, with additional coding done in VBScript and Jscript. The back end database is a Microsoft Access XP database. Knowledge of Microsoft Word and Word-Access merge functionality is also desired since the final, printed program is merge produced from the on-line Access database.

Year-round functionality is expected, with peak work times occurring in late Spring and early Summer (as submissions for the program are reviewed and the program is planned), then again in mid- to late-Summer (as the program is finalized). Individuals will receive an honorarium.

Interested individuals should contact:

Dr. Carmen Giebelhaus
9500 Lehr Ct.
Manassas, VA 20110
(703) 392-1312
e-mail: drgieb@aol.com

A Comparative Study of the Angoff and Nedelsky Methods: Implications for Validity

Michael J. Subkoviak
Michael T. Kane
Patrick H. Duncan
University of Wisconsin-Madison

Abstract

The Angoff and Nedelsky methods are two well-known procedures for setting passing scores on tests. Previous comparative studies indicate that the Nedelsky method tends to consistently set the lowest passing score relative to the Angoff and other methods. However, it cannot be concluded that the lower Nedelsky estimates are less accurate, because previous studies have not included a criterion of the "correct" passing score against which Nedelsky and other passing scores could be validated. The present paper describes an experiment in which criterion measures of the "correct" passing scores were generated and were compared for accuracy to Angoff and Nedelsky estimates.

Background

The Angoff (1971) and Nedelsky (1954) methods for setting passing scores on tests are two prominent examples of test-centered methods (Jaeger, 1989; Plake, 1998) in which judges examine the items of a test and determine the level of performance expected of a hypothetical individual who just meets the performance standard.

The basic form of the Angoff procedure asks judges to envision a minimally competent examinee and to estimate the probability that this borderline examinee will answer each item correctly. This probability is called a **minimum pass level**, or MPL. To make things easier, the judges are sometimes told to imagine a group of 100 minimally competent individuals and to estimate the number or proportion of these individuals who would answer the item correctly. In either case, the MPLs are averaged over judges to get the item MPL, and the item MPLs are summed over the items in the test to get a passing score. There are many variations on the Angoff procedure; Berk (1986) lists eight variations.

The Nedelsky method also obtains the judged probability of correct response to a multiple-choice item for a hypothetical examinee who just meets the performance standard, but in a different way. The Nedelsky method was specifically designed for multiple-choice questions. For a given item, the judge determines the number of options that the examinee could **not** eliminate as incorrect. The reciprocal of this number is taken as the probability of correct response, and the sum of these probabilities across items is the desired passing score. The Nedelsky method has been questioned (Brennan and Lockwood, 1980) because it permits only a discrete set of probabilities to be specified for an m-option item: 1/m, 1/(m-1), ..., 1/2, 1; and it also involves the unrealistic assumption that an examinee guesses at random among the options not recognized as incorrect.

The Angoff procedure, and to a lesser extent, the other test-centered methods, have been criticized for requiring judges to perform cognitive tasks that are much too difficult (Shepard, Glaser, Linn and Bohrnstedt, 1993; Shepard, 1995). However, Zieky (1995, p.30) has suggested that Angoff judges are not actually estimating *p*-values for hypothetical minimally competent examinees, but are instead using their ratings to specify what they mean by minimal competence. And a number of studies (e.g., Impara and Plake, 1989) have indicated that judges are not very accurate in estimating empirically derived *p*-values.

Furthermore, Shepard, et al., (1993) and Shepard (1995) present data suggesting that Angoff judges tend to underestimate the difficulty of more difficult items and to overestimate the difficulty of easier items. In other words, the scale of Angoff probabilities is compressed in comparison to the scale of empirical *p*-values. McLaughlin (1993), also found that the passing scores on NAEP tests seemed to be biased by a tendency of the judges to avoid extreme MPLs. As Shepard, et al., (1993, p.58) put it, "while judges estimated higher *p*-values for easy items than for hard items (as evidenced by correlations between judges' ratings and real-data *p*-values), judges failed to adjust sufficiently for differences in item difficulty." Jaeger (1989) suggests that the Angoff MPLs tend to have higher correlations with *p*-values than the other test-centered methods. Nevertheless, the results reported by McLaughlin (1993) and Shepard, et al., (1993) suggest that Angoff judges may avoid very high or low MPLs; and a compression effect if it were linear, would not necessarily diminish the correlation.

Adjustments for task difficulty are an integral, although perhaps implicit, part of estimating the MPL (Kane and Wilson, 1984). A tendency of the judges to avoid extreme MPLs would be a potential source of bias in the passing scores. If a test had a substantial number of very easy items (and no balancing set of very difficult items), the passing score would tend to be set too low, and if a test had a preponderance of very difficult items, the passing score would tend to be set too high, relative to what it would otherwise be.

In studies comparing passing scores that result from different methods, the Nedelsky method tends to consistently set the lowest passing score when compared to the Angoff and other methods (Jaeger, 1989; Mehrens, 1995). However, it cannot be concluded from these studies that the lower Nedelsky passing scores are necessarily less accurate, because previous studies have not included a criterion or measure of the "correct" passing score against which the Nedelsky or other passing scores could be validated. Kane (1994, pp. 438-39) refers to this as the "criterion problem", which he summarizes as follows: "...although many studies have found substantial differences in passing scores and passing rates for different methods, the lack of external criteria indicating what the passing score should be has made it impossible to decide which of the passing scores should be preferred..." In response, some recent studies have begun to examine the test-centered methods in contexts in which it is possible to identify a criterion that can be used to evaluate the accuracy of the estimation procedure used in the standard setting method. For example, Chang (1999) compared Angoff and Nedelsky probability estimates in terms of their accuracy in predicting empirically derived *p*-values (external criteria) for a set of test items; Mauer, Alexander, Callahan, Bailey and Dambrot (1991) compared Angoff probability estimates to empirical *p*-values for a group of minimally competent examinees; and Subkoviak and Franke (1988) compared Angoff and Nedlesky estimated scores to actual, observed scores.

The present paper describes an experiment in which external criterion measures of the "correct" passing score were generated and were then compared for accuracy to Angoff and Nedelsky passing scores. The context of the study, involving university students estimating their own performance on a test, is very different from that in most standard setting applications and therefore extrapolations of the results to actual standard setting applications must be tentative. However, the experimental design does make it possible to examine the accuracy of the estimates resulting from the Angoff and Nedelsky procedures, as a function of item difficulty, and therefore makes it possible to examine the relative accuracy of the Angoff and Nedelsky methods, at least, in this context.

Method

Subjects and Standard Setting Techniques

Eighty-four students at the University of Wisconsin-Madison served as subjects. In this experiment an individual subject was taught to use either the Angoff or the Nedelsky method to specify the probability he or she would correctly respond to each of twenty items selected from the verbal section of the SAT. The sum of these probabilities represents an **estimated** test score for this subject, derived by whichever of the two methods, (the Angoff or Nedelsky method) the student used. Note that the students are not being asked to estimate the performance of some hypothetical "minimally competent examinee," as would usually be the case in standard setting contexts, but rather to predict their own performance.

In applying the Nedelsky procedure, which involves making decisions about which item options can be eliminated as distractors, subjects sometimes mistakenly eliminate the keyed (correct) option. When this happens, one of at least three different methods can be used to estimate the item's Nedelsky probability: (1) ignore the mistake and count all distractors correctly eliminated (Brennan and Lockwood, 1980); (2) subtract one from the number of distractors correctly eliminated as a penalty for guessing, in accordance with the usual correction for guessing formula (Subkoviak and Franke, 1988); or (3) assume a purely random guessing model and assign a probability of 1/m, or 1/5 in this case (Duncan, 1997). All three methods were applied in the present study; and the results were essentially the same, regardless of which correction method was used. The results reported here are based on the Subkoviak and Franke correction, and results based on the other two methods are reported elsewhere (Duncan, 1997).

After applying either the Angoff or Nedelsky method to the items, the subject was next asked to select the best answer to each of the same twenty items, thereby generating an **actual** test score (external criterion) against which the Angoff or Nedelsky estimates could be validated. The absolute difference between a subject's estimated and actual test score was taken as the dependent measure of interest, smaller differences indicative of greater accuracy. The bias, or tendency to over- or underestimate actual test scores was also examined.

Instruments

Two tests of twenty SAT vocabulary items were constructed for use in the experiment. The average item difficulty (*p*-value) for the easier of the two tests was .89 for a national norm group, while the average item difficulty for the other test was .59; thus, the terms "easy test" and "medium-difficulty test", respectively, are used to distinguish the two tests. Logic suggests that the appropriateness of a particular standard setting technique may vary as a function of item difficulty. For example, Nedelsky probabilities for a five-option SAT item assume the following discrete values: .20, .25, .33, .50, 1. If a judge wishes to specify probability values within the range .50 to 1 for items on the easy test, the Nedelsky method will not accommodate such specification. On the other hand, if a judge wishes to specify probability values within the range 0 to .50 for items on the medium-difficulty test, the Nedelsky method is more accommodating. Thus, the Nedelsky method may prove more appropriate for the medium-difficulty test than the easy test. The Angoff method is flexible enough to accommodate both easy and medium-difficulty tests, since a continuous range of probability values from 0 to 1 can be specified.

Procedure

The Angoff and Nedelsky methods were completely crossed with the easy and medium-difficulty test instruments to produce four experimental conditions. A total of 84 students were randomly assigned in equal numbers to the four conditions, resulting in 21 subjects per condition. As previously indicated, each subject was taught to use either the Angoff or Nedelsky method to **estimate** his or her own score on either the easy or medium-difficulty test. Subsequently, the subject generated an **actual** score on the same test. The absolute difference between actual and estimated score, referred to as **error** score, was computed as the dependent variable in a two-way, fixed-effects ANOVA.

The procedures used in the present study are similar to those employed by Subkoviak and Franke (1988) in a sequence of two independent experiments. In the first experiment, the Angoff and Nedelsky methods produced similar levels of error score when applied to a medium-difficulty test. In the second experiment, involving an independent sample of subjects, the Nedelsky method produced higher levels of error than the Angoff method when applied to an easy test. However, since independent samples of subjects were employed, the results of the two experiments could not be directly compared by Subkoviak and Franke; and the interaction of standard setting method and test difficulty level could not be directly analyzed.

Results

Table 1 reports the means and standard deviations of absolute error scores, expressed as a percentage of the maximum possible test score, which was 20.

Table 1
Means and Standard Deviations of Error Scores (Actual-Estimated) Expressed as Percentages*

	Angoff	Nedelsky	Average
Easy Test	22.3 (16.7)	37.3 (16.5)	29.8 (16.6)
Med.-Diff. Test	14.6 (10.3)	12.8 (10.2)	13.7 (10.2)
Average	18.5 (14.2)	25.1 (18.4)	

*Standard deviations in parentheses.

The results of the ANOVA indicated that all effects were significant at the =.05 level. Specifically, there was significantly (F=4.85) less error associated with the Angoff method (18.5%) than with the Nedelsky method (25.1%), suggesting that the restricted range of Nedelsky probability values had a detrimental effect on the accuracy of derived estimates. There was significantly (F=28.98) less error on the medium-difficulty test (13.7%) than on the easy test (29.8%), due primarily to the substantial error (37.3%) arising from use of the Nedelsky method with easy test items, as anticipated. Finally, the interaction between method of estimation and difficulty of test was significant (F=6.27), reflecting the fact that the difference between the Angoff and Nedelsky methods was much larger on the easy test (22.3% vs 37.3%) than on the medium-difficulty test (14.6% vs 12.8%). This interaction is attributable to the fact that Nedelsky probabilities cannot assume values between .50 and 1 as required for easy test items, but can assume values between 0 and .50 as needed for medium-difficulty test items. Thus, the level of error associated with the Angoff and Nedelsky methods is not comparable on the easy test, but is comparable on the medium-difficulty test.

The results also suggest that judges tend to underestimate their own performance on both kinds of items, but mainly on the easy items. A total of 69 of the 84 subjects underestimated their score. As indicated in Table 2, on the easy test, all 21 of the Nedelsky judges underestimated their scores (median underestimate 8.1 points out of 20), and 19 of the 21 Angoff judges underestimated their scores (median underestimate 3.4 points out of 20); and these outcomes were statistically significant for both methods. For the Nedelsky method, the tendency to underestimate scores on the easy test can be explained both by the restricted range of the Nedelsky probability scale and by the questionable assumption that examinees guess **randomly** among the options that could not be eliminated, rather than making educated guesses based on partial knowledge, as is likely to occur on an actual test administration. For the Angoff method, the tendency to underestimate scores on the easy test can be explained by the tendency of Angoff judges to avoid specifying extreme probability values, i.e., the compression effect noted previously.

On the medium-difficulty test, both groups appeared to underestimate their scores but the sign test was not significant in either case. However, logic and the analysis presented in Figure 1 below suggest that the random guessing assumption of the Nedelsky method would tend to produce underestimates of observed scores on medium-difficulty tests, the degree of underestimation decreasing as items become more difficult. Conversely, logic and the analyses presented in Figure 2 below suggest that the compression effect of the Angoff method would tend to produce overestimates of observed scores as items become more difficult.

Table 2
Sign Test Results and Median Error for Each Condition

		Angoff	Nedelsky
Easy Test	No. Positive Errors	19 of 21*	21 of 21*
	Median Error	3.4	8.1
Med.-Diff. Test	No. Positive Errors	14 of 21	15 of 21
	Median Error	1.3	1.3

*Significant at =.05 level.

Implications

As noted earlier, the results reported here cannot be directly applied to actual standard setting applications, because the procedures employed differ from the standard setting methods used in most high stakes testing procedures in

several ways. First, the raters were estimating their own performance on the items, rather than the performance of hypothetical, minimally competent examinees. Second, the raters were not necessarily expert on the content being covered. Third, the raters did not engage in a lengthy process of review, involving several iterations in which the judgements being made are reviewed in light of various kinds of data as is usually done in actual, high-stakes standard setting. The advantage of this kind of study is that it was possible to employ an experimental design, in which raters were randomly assigned, and the "true" value of the variable being estimated in the standard setting could be determined independently of the standard setting process being used.

The first conclusion to be drawn from the study is that under certain conditions, in particular when the probabilities to be estimated are greater than .50, estimates derived using the Nedelsky method may be significantly less accurate than estimates derived using the Angoff method. As such, the study provides concrete evidence of the fact that "the restricted nature of the Nedelsky (inferred) probability scale may constitute a basis for seriously questioning the applicability of this procedure in certain contexts" (Brennan and Lockwood, 1980, p.219). Figure 1 illustrates this limitation as well as the potential of the Nedelsky method. Each of the 40 items used in the present study is plotted on the basis of its empirical *p*-value and the average ($\overline{p}_N$) of the Nedelsky probabilities specified for that item. In other words, p is the proportion of subjects that gave the correct answer to a given item; and $\overline{p}_N$ is the mean of the Nedelsky probabilities specified for that item.

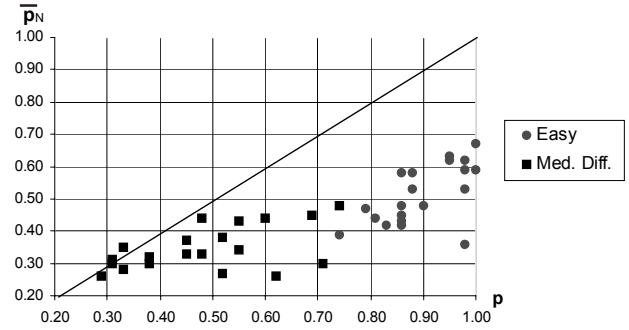

Figure 1. Scatter Plot of Empirical (p) and Nedelsky ($\overline{p}_n$) Probabilities

Furthermore, p and $\overline{p}_N$ are comparable in the sense that both are estimates of the probability of a correct item response, p being an empirical estimate and $\overline{p}_N$ being a subjective estimate of the same parameter. Thus, under certain conditions, p and $\overline{p}_N$ may be equal; and the corresponding point will lie along the diagonal line of Figure 1. Under other conditions, p and $\overline{p}_N$ may be quite different and the corresponding point will be some distance from the diagonal line. Since almost all points in Figure 1 fall below the diagonal, it is quite clear that Nedelsky $\overline{p}_N$ values tend to underestimate corresponding empirical *p*-values. Furthermore, for *p*-values between .50 and 1.00, the degree of underestimation is more substantial than for *p*-values between 0 and .50. Thus, Figure 1 illustrates the effect which the restricted Nedelsky probability scale has on the accuracy of resulting $\overline{p}_N$ estimates.

Secondly, the results of Table 2 indicate that underestimation of scores (and therefore of *p*-values) was substantial for the easy items for **both** the Nedelsky and Angoff methods. However, the relationship of Angoff probabilities to empirical *p*-values is different than that depicted in Figure 1 for Nedelsky probabilities. In Figure 2, each of the 40 items is plotted according to its empirical *p*-value and the average ($\overline{p}_A$) of the Angoff probabilities specified for the item. Note the tendency in Figure 2 of Angoff $\overline{p}_A$ values to overestimate empirical *p*-values at the lower end of the probability scale (.20 p .60) and to underestimate *p*-values at the upper end of the scale (.60 p 1.00). This is consistent with the results reported for the Angoff method by McLaughlin (1993) and by Shepard, et al., (1993). Mauer, et al., (1991) illustrate methods that can be used to enhance the accuracy of Angoff cutoff scores, such as eliminating or correcting data from idiosyncratic judges; and potential users would be well advised to consider such methods. However, it is not clear that such methods would totally eliminate systematic compression of the Angoff probability scale illustrated in Figure 2.

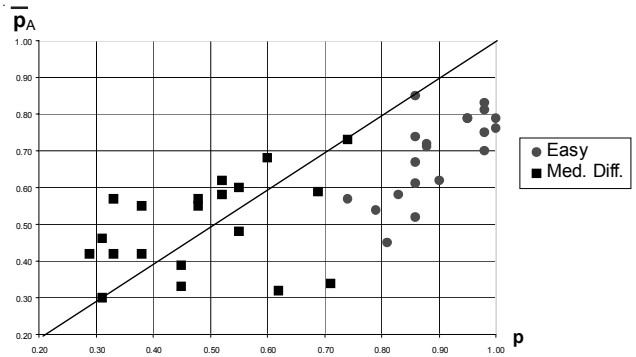

Figure 2. Scatter Plot of Empirical (p) and Angoff ($\overline{p}_a$) Probabilities

Thus, the present study represents another pebble on the pile of concerns that have been raised about test-centered methods, such as Nedelsky and Angoff. Consequently, as Kane (1998) notes, increased attention is currently being paid to examinee-centered methods in which judges make decisions about actual examinees rather than test items (Clauser and Clyman, 1994; Cohen, Kane and Crooks, 1999; Jaeger and Mills, 1998). Examinee-centered methods may be particularly appropriate for applications in which judges evaluate an examinee's holistic performance, as in the arts or sports. On the other hand, test-centered methods are specifically designed for use with objective tests in which judges analytically rate individual items; but, to quote Kane (1998, p. 141): "It is certainly possible to question whether the results mean what we think they mean."

References

Angoff, W. H. (1971). Scales, norms, and equivalent scores. In R. L. Thorndike (Ed.), *Educational measurement* (2nd ed., pp. 508-600). Washington, DC: American Council on Education.

Berk, R. A. (1986). A consumer's guide to setting performance standards on criterion-references tests. *Review of Educational Research*, *56*, 137-172.

Brennan, R. D., and Lockwood, R. E. (1980). A comparison of the Nedelsky and Angoff cutting score procedures using generalizability theory. *Applied Psychological Measurement*, *4*, 219-240.

Chang, L. (1999). Judgmental item analysis of the Nedelsky and Angoff standard setting methods. *Applied Measurement in Education*, *12*, 151-165.

Clauser, B., and Clyman, S. (1994). A contrasting groups approach to standard setting for performance assessments of clinical skills. *Academic Medicine, RIME Supplement*, *69*, 42-44.

Cohen, A. S., Kane, M. T., and Crooks, T. J. (1999). A generalized examinee-centered method for setting standards on achievement tests. *Applied Measurement in Education*, *12*, 343-366.

Duncan, P. H. (1997). *Comparing cutoff scores: A replication of "A note on the accuracy of passing scores set by the Angoff and Nedelsky methods"*. Unpublished M.S. thesis, University of Wisconsin-Madison.

Impara, J. C. and Plake, B. S. (1998). Teacher's ability to estimate item difficulty: A test of the assumptions in the Angoff standard-setting method. *Journal of Educational Measurement*, *35*, 69-81.

Jaeger, R. M. (1989). Certification of student competence. In R. L. Linn (Ed.), *Educational Measurement* (3rd ed., pp. 485-514). New York: American Council on Education and Macmillan.

Jaeger, R. M., and Mills, C. N. (1998, April). *An integrated judgement procedure for setting standards on complex large-scale assessments*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Kane, M. (1994). Validating the performance standards associated with passing scores. *Review of Educational Research*, *64*, 425-461.

Kane, M. (1998). Choosing between examinee-centered and test-centered standard-setting methods. *Educational Assessments*, *5*, 129-145.

Kane, M., and Wilson, J. (1984). Errors of measurement and standard setting in mastery testing. *Applied Psychological Measurement*, *8*, 107-115.

Mauer, T. J., Alexander, R. A., Callahan, C. M., Bailey, J. J., and Dambrot F. H. (1991). Methodological and psychometric issues in setting cutoff scores using the Angoff method. *Personal Psychology*, *44*, 235-262.

McLaughlin, D. H. (1993). Validity of the 1992 NAEP achievement-level-setting process. *Setting performance standards for student achievement: Background studies*. Stanford, CA: The National Academy of Education.

Mehrens, W. (1995). Methodological issues in standard setting for educational exams. *Proceedings of the joint conference on standard setting for large-scale assessment: Vol. II*, 221-263. Washington, D.C.: National Assessment Governing Board (NAGB) and the National Center for Educational Statistics (NCES).

Nedelsky, L. (1954). Absolute grading standards for objective tests. *Educational and Psychological Measurement*, *14*, 3-19.

Plake, B. (1998). Setting performance standards for professional licensure and certification. *Applied Measurement in Education*, *11*, 65-80.

Shepard, L., (1995). Implications for standard setting of the National Academy of Education evaluation of the national assessment of educational progress achievement levels. *Proceedings of the joint conference on standard setting for large-scale assessment: Vol. II*, 143-160. Washington, D.C.: National Assessment Governing Board (NAGB) and the National Center for Educational Statistics (NCES).

Shepard, L., Glaser, R., Linn, R., and Bohrnstedt, G. (1993). Setting performance standards for student achievement. *A Report of the National Academy of Education Panel on the Evaluation of the NAEP Trial State Assessment: An Assessment of the 1992 Achievement Levels*. National Academy of Education, Stanford University, Stanford, CA.

Subkoviak, M. J., and Franke, T. (1988). *A note on the accuracy of passing scores set by the Angoff and Nedelsky methods*. Paper presented at the annual meeting of the National Council on Measurement in Education, New Orleans, LA.

Zieky, M. J. (1995). A historical perspective on setting standards. *Proceedings of the Joint Conference on Standard Setting for Large Scale Assessment: Vol. II*, 1-38. Washington, D.C.: National Assessment Governing Board (NAGB) and the National Center for Educational Statistics (NCES).

Examining the Cost-Outcome Relationship of a Fortified Class-Size Reduction Program

Derick M. Kiger
Northern Illinois University

Abstract

Class-size reduction initiatives have been criticized for producing modest achievement gains for the resources they consume. Wisconsin's Student Achievement Guarantee in Education (SAGE) was designed to amplify the achievement benefits of smaller classes by requiring complementary changes in the teaching and learning environment and accountability for results. This study examined SAGE in an urban school district. The achievement benefits realized by the evaluand were marginalized by high per-student costs and similar performance of comparison groups on a state-mandated reading test. Suggestions for improving the cost-outcome relationship were presented.

Introduction

The heightened interest in class size reduction (CSR) as a way to improve student achievement has been stimulated by several factors including increasing enrollments, a perceived achievement crisis, and a quest for programming to reduce educational inequities among advantaged and disadvantaged students. Post-WWII efforts to make public education more accessible combined with the "baby boom" population explosion to increase enrollments in U.S. public schools. According to the National Center for Education Statistics (1999), enrollment increased from 25.1 million in 1950 to 46.7 million in 1998. It is during this enrollment growth period that educational researchers focused their collective attention on the relationship between class size and achievement (Mitchell and Beach, 1990).

The "echo" of the baby boom promises to sustain experimentation with CSR programming. According to a special report issued by the U.S. Department of Education (1999, August 19), the public and private school enrollments are projected to increase each school year from 1999 to 2006. The number of births is also expected to increase slightly during the first part of the 21st century.

Many stakeholders of U.S. public schools have perceived a prolonged crisis in student achievement. The crisis has roots in the 1980s when politicians used declining domestic test scores and poor performance on international achievement tests to promote reform agendas (Berliner and Biddle, 1995). Business and industry contributed to the perceived crisis by claiming graduates of public schools were ill prepared for the emerging high-tech work force. Crisis response has embodied many educational reforms including school choice, continuous school improvement, standards-based accountability, and class size reduction.

Besides record enrollments and the achievement crisis, the quest for educational equity stimulated interest in targeted interventions. The gap between advantaged and disadvantaged students widened during a transitioning post-WWII economy (Mirel and Angus, 1994). Economic disparity coupled with sobering descriptions of failing and deteriorating schools motivated stakeholders' demands for equitable access to educational resources and opportunity (Kozol, 1991).

The federal government instituted a series of legislation and programming to improve the educational resources and opportunities of disadvantaged student populations. The Elementary and Secondary Education Act (1965) authorized grants for elementary and secondary school programs for children of low-income families. Similarly, the Education for All Handicapped Children Act (1975) provided free and appropriate public education to all handicapped students and the Childhood Education and Development Act (1989) authorized the expansion of the Head Start preschool program for disadvantaged families.

The federal Class-Size Reduction Program (1999) divided 1.2 billion dollars among the states to improve achievement of economically disadvantaged schools. The federal government proposed an initial 21st-century CSR investment exceeding 20 million dollars to hire more teachers. The goal was to reduce the national average class size in grades 1, 2, and 3 to 18 students (Brewer, Krop, Gill, and Reichardt, 1999).

Many states preceded the federal CSR program by committing significant resources to reduce class sizes. Indiana and Tennessee were forerunners in the development and use of CSR programming. During the decade of 1980, these states sought to affect student achievement by providing grants to reduce K-3 class size to 20 students or less in volunteer schools. California and Wisconsin followed suit in the 1990s by introducing early-grade CSR programs. Wisconsin's program named the Student Achievement Guarantee in Education (SAGE) linked class-size reduction to complementary changes in the teaching and learning environment and accountability for results. The purpose of the fortified design strategy was to amplify the achievement benefits of smaller classes.

The CSR Achievement Impact

The literature base providing evidence of a CSR achievement impact consists largely of evaluation findings from state class-size reduction programs. These initiatives have generally reduced K-3 class sizes to 20 students or less. The evidence shows significant achievement effects that are most powerful for economically disadvantaged and minority students at kindergarten and grade 1 (Bohrnstedt and Stecher, 1999; Finn and Achilles, 1999; Molnar, Smith, Zahorik, Palmer, Halbach, and Ehrle, 1999).

The initial CSR achievement benefits continue through middle school and high school according to some follow-up studies (Nye, Hedges and Konstantopoulos, 1999). CSR students may be less likely to fail a grade level or be suspended compared with students attending regular-sized classes in grades K-3 (Pate-Bain, Boyd-Zaharias, Cain, Word, and Binkley, 1997). Early-grade CSR may also result in a greater percent of students completing advanced course work in high school (Pate-Bain, Fulton, and Boyd-Zaharias, 1999) and taking college-entrance exams (Krueger and Whitmore, 1999).

Explanations of the CSR Achievement Impact

An emerging segment of research seeks to explain how CSR influences achievement. Several explanations have been provided (Anderson, 2000; Mitchell, Beach, and Badarak, 1989; Molnar, Smith, Zahorik, Halbach, Ehrle, Hoffman, and Cross, 2001; Pong and Pallas, 2001). A common theme is that smaller classes affect student achievement indirectly by individualizing the teaching and learning process. Fewer students provide teachers an opportunity to deepen curriculum and increase coverage, and vary instructional and assessment practices. Teachers are also afforded an opportunity to know students better and attend to their needs more effectively.

Criticisms of CSR

Despite the enhanced teaching and learning opportunity created by reduced class size, researchers have not observed corresponding changes in curriculum or instructional practices (Betts and Shkolnik, 1999; Pong and Pallas, 2001; Stasz and Stecher, 2000; Varble, 1990). Analysis of smaller classes has shown a focus on reading and basic skills and a reliance upon teacher-centered instructional techniques (Odden, 1990).

The viability and effectiveness of CSR have also been jeopardized by high programming and opportunity costs, limited classroom space, and a diminishing supply of qualified teachers (Brewer, Krop, Gill, and Reichardt, 1999; Hanushek, 1999). The focus of CSR research has also been criticized for overlooking the cost-outcome relationship of smaller classes (Hruz, 2000)

The relevant question to policy makers is not simply if class size reductions—of the nature currently proposed—increase student achievement. Despite the answer to the question, there remains the often overlooked corollary issue of whether these increases are acceptable relative to the costs needed to achieve them. In addition, there is a definite need to see if other educational programs do so at a substantial cost savings to the government and the taxpayers who underwrite public education. (p. 34)

Purpose

This study examined the cost-outcome relationship of Wisconsin's SAGE program in an urban school district. The following question guided the research:

> Is SAGE cost-effective for improving reading comprehension scores given budget constraints, alternative programs, and minimally acceptable achievement outcomes for students?

Context

The evaluand is a south-central Wisconsin city school district with a resident population of approximately 35,000. The city's residents are racially and economically diverse, as approximately 30 percent are minority and economically disadvantaged. The city has experienced an increase in its Hispanic and bilingual population.

The city school district comprises 12 elementary schools, 2 middle schools, and 1 high school and serves approximately 6,775 students (School District, 1999a). Approximately 62 percent of students are white, 28 percent African American, 9 percent Hispanic, and 1 percent Asian/Pacific Islander or Native American. Approximately 40 percent of K-12 students qualify for free or reduced lunches per federal guidelines. Eighteen percent (18%) present special education needs. Student mobility approaches 40 percent at some elementary schools. The average number of elementary students per classroom teacher is 21.

Program Participants

There were 330 students who persisted at an elementary school (grades 1 to 3, 1996-1999) offering one of four educational programs (SAGE, N=30; P-5, N=111; Title I, N=26; and Nonprogram, N=163) and received valid scores on the 1999 Wisconsin Reading Comprehension Test. Table 1 presents the demographics of each group's "three-year persisters."

Student Achievement Guarantee in Education (SAGE)

One of the district's 12 elementary schools implemented Wisconsin's SAGE program from 1996 to 1999. The program goal is to improve academic achievement of students in kindergarten through third grade in schools serving high percentages of low-income children. SAGE schools receive $2,000 per low-income student in the eligible grades to (1)

Table 1
Three-year Persisters (grades 1-3, 1996-1999)

	SAGE[a]		P-5[b]		Title I		Nonprogram[d]	
Student Characteristics	N	%	N	%	N	%	N	%
Male	14	46.7	52	46.8	13	50.0	76	46.6
Female	16	53.3	59	53.2	13	50.0	87	53.4
Asian	1	3.3	0	0.0	0	0.0	0	0.0
African American	5	16.7	56	50.5	3	11.5	15	9.2
Hispanic	1	3.3	11	9.9	6	23.1	7	4.3
White	23	76.7	44	39.6	17	65.4	141	86.5
Economically Disadvantaged	5	16.7	72	64.9	15	57.7	39	23.9
Exceptional Education Needs	3	10.0	15	13.5	2	7.7	21	12.9
Limited English Proficiency	2	6.7	3	2.7	3	11.5	0	0.0

[a]N = 30; [b]N = 111; [c]N = 26; [d]N = 163.

reduce K-3 class sizes to 15 students, (2) offer education and human services before school, after school, on weekends, and during the summer, (3) develop and implement a curriculum based on rigorous content and performance standards, and (4) develop and implement a program-focused staff development system. Staff members are also accountable for student achievement and may be dismissed or transferred from the program if they do not meet performance standards.

Any Board of Education may enter a five-year program contract with the Wisconsin Department of Public Instruction for a school with a low-income enrollment of 30 percent or greater. However, schools participating in the state's Preschool-to-Grade 5 program (P-5) are not eligible to participate. The P-5 program preceded SAGE and provides low-income schools state aid to improve student achievement via innovative programming and class size reduction.

Preschool-to-Grade 5 (P-5)

Five of the district's 12 elementary schools implemented Wisconsin's P-5 program from 1996 to 1999. The program goal is to improve academic achievement of students in preschool through fifth grade in select inner-city schools serving high percentages of low-income students. P-5 schools receive state aid to (1) reduce PK-5 class sizes to 25 students or less, (2) provide preschool programming, (3) provide busing for purposes of mobility reduction, and (4) provide program-related inservice training to instructional staff. There was an average of 19 to 23 students per classroom teacher for the district's P-5 schools in 1999 (School District, 1999a).

Title I Program

One of the district's 12 elementary schools participated in the federal Title I program from 1996 to 1999. The program goal is to improve the schoolwide teaching and learning of children in high-poverty schools. Schools with high percentages of low-income students qualify for federal aid to help meet challenging academic standards and promote continuous improvement of educational programs. There was an average of 24 students per classroom teacher for the district's Title I school in 1999 (School District, 1999a).

Nonprogram

Five of the district's 12 elementary schools did not implement SAGE, P-5, or Title I programming from 1996 to 1999. Nonprogram schools relied upon the standard allocation of state revenue per student and miscellaneous grants to support program initiatives. There was an average of 21 to 25 students per classroom teacher for the district's Nonprogram schools in 1999 (School District, 1999a).

Data Sources

The 1999 Wisconsin Reading Comprehension Test (WRCT) was used to compare group reading achievement. All third-grade students of Wisconsin public schools are required to take the reading test each spring. The results identify the reading proficiency of individual students and give districts information that will help in evaluation of primary reading programming (Wisconsin Department of Public Instruction, 1999). The WRCT is developed under the supervision of the Department of Public Instruction and the State Superintendent's Advisory Committee. The annual test development process includes passage selection, item development, field testing, analysis of field test results, test revision, bias review, and preparation of the final test.

The 1999 WRCT was administered in three sessions and consisted of three reading passages, two narrative stories of about 1,200 words each and one expository report of about 700 words (Wisconsin Department of Public Instruction, 1999). A set of questions followed each passage that measured reading comprehension, reading strategy, and prior knowledge. Reading comprehension scores from each passage were combined to yield a total comprehension score (points possible = 67). The WRCT contained 61 multiple-

choice reading comprehension questions (1 point each) and two short-answer reading comprehension questions (0-3 points each). Total comprehension scores were categorized as Advanced (62-67 points), Proficient (49 - 61 points), Basic (32 - 48 points) or Minimal (< 32 points).

Program Cost Analysis

A 1999 per-student cost for each program was used with test performance to estimate cost effectiveness. The cost analysis included grants received from federal and state funding sources. A summary of the analysis (see Table 2) shows the reallocation of program development and school improvement aid financed a significant portion of SAGE. The "extra" revenue was needed for additional classroom teachers and assistants, curriculum development, and busing routes on program-specific staff development days (School District, 1999b). The per-student cost for each program follows: SAGE, $2,136.99; P-5, $1,415.57; Title I, $1,275.79; and Nonprogram, $328.59.

Data Collection

All data were collected from the district's Administrative Offices. Enrollment records were gathered to identify each group's three-year persisters. The 1999 WRCT test scores were obtained in SPSS file format and included student identification numbers, student demographic information, and program codes. The researcher was also provided the program cost analysis from the district's Business Services Department.

Data Analysis

Statistics such as means and standard deviations were used to describe reading test performance. ANCOVA was used to test for differences in adjusted mean reading comprehension scores. Confidence intervals, effect sizes and cost-effectiveness ratios were calculated to characterize between-group differences. SPSS for Windows 10.0 was used to analyze the data.

Table 2
Per-Student Cost

	Students	Grant					Cost
Program	N	P-5	Title I	SAGE	Other[a]	Total	Per Student
SAGE	K-3						
School I	180	$0	$0	$106,000	$278,659	$384,659	$2,136.99
Total	180	$0	$0	$106,000	$278,659	$384,659	$2,136.99
P-5	K-5						
School I	209	$75,101	$167,633	$0	$91,679	$334,413	$1,600.06
School II	356	$134,965	$318,919	$0	$47,442	$501,326	$1,408.22
School III	236	$79,455	$108,659	$0	$29,929	$218,043	$923.91
School IV	336	$119,707	$388,636	$0	$44,687	$553,030	$1,645.92
School V	267	$98,321	$249,533	$0	$32,800	$380,654	$1,425.67
Total	1,404	$507,549	$1,233,380	$0	$246,537	$1,987,466	$1,415.57
Title I	K-5						
School I	279	$0	$245,534	$0	$110,411	$355,945	$1,275.79
Total	279	$0	$245,534	$0	$110,411	$355,945	$1,275.79
Nonprogram	K-5						
School I	322	$0	$0	$0	$60,680	$60,680	$188.45
School II[b]	284	$0	$50,000	$0	$88,290	$138,290	$486.94
School III[b]	320	$0	$50,000	$0	$101,894	$151,894	$474.67
School IV	244	$0	$0	$0	$68,565	$68,565	$281.00
School V	273	$0	$0	$0	$54,732	$54,732	$200.48
Total	1,443	$0	$100,000	$0	$374,161	$474,161	$328.59
Grand Total	3,306	$507,549	$1,578,914	$106,000	$1,009,768	$3,202,231	$968.61

[a] Includes district program development allocations, Title II, Title VI, & Comprehensive School Reform grants, and miscellaneous grants.
[b] Planning year for Title I. Most funds were not available for direct instruction.

Analysis of Covariance (ANCOVA)

ANCOVA was used to assess differences in mean reading comprehension scores controlling for prior knowledge, reading strategy, and student demographic variables. Pairwise comparisons using the Bonferroni technique were made to detect which means differed following a statistically significant ANCOVA. The technique adjusts the observed significance level by the number of comparisons made. A 0.05 alpha level was used to indicate statistical significance.

Covariates

The 1999 WRCT included questions that measured students' existing knowledge about the subjects covered in the passages and reading strategies they used to help them understand what they read (Wisconsin Department of Public Instruction, 1999). There were 6 to 8 prior knowledge questions and 4 to 6 reading strategy questions for each passage.

Several student variables were also included as covariates. The variables were "Dummy" coded 1 or 0: Gender status (Female=1, Male=0); African-American status (Black, Not Hispanic origin=1, Not=0); Hispanic status (Hispanic=1, Not=0); Economically Disadvantaged status (Qualify for Free or Reduced Lunch=1, Not=0), Exceptional Education Need status (Special Education=1, Not=0); and Limited English Proficient status (Limited English Proficient=1, Not=0).

Effect Size

An indicator of effect size (d-index) was used to qualify differences in reading scores. Effect sizes are interpreted as group differences in standard deviation units. The d-index for this study was calculated by dividing the difference between program and Nonprogram adjusted mean reading comprehension scores by their averaged standard deviations. Effect sizes of 0.20 to 0.49, 0.50 to 0.80, and 0.80 plus are considered small, medium, and large (Cohen, 1988).

Cost-effectiveness

Estimating cost-effectiveness provides important contextual evidence for judging the relative merit of different programs (Cooper and Lindsay, 1998). The following prerequisites should be considered before adding cost-effectiveness to an impact analysis (Rossi, Freeman, and Lipsey, 1999):

1. Programs should have separable funding sources.
2. Programs should be mature.
3. The magnitude of program impact can be determined.
4. Program benefits can be converted to monetary terms.
5. Decision makers are considering alternative programming.

The prerequisites were met. Cost-effectiveness ratios were calculated by dividing the per-student cost of each program by the adjusted mean reading score differences between the program and Nonprogram groups (Popham, 1993).

Results

The WRCT is a state-mandated reading test administered to Wisconsin third-grade students each spring. The SAGE group earned the highest unadjusted reading comprehension score (M= 56.93, SD=10.04). The score was Proficient according to state reading performance standards. The P-5 group (M= 50.37, SD=11.80) and the Nonprogram group also earned unadjusted reading comprehension scores in the Proficient category (M= 50.18, SD=12.20). The Title I group earned unadjusted reading comprehension scores in the Basic category (M=44.88, SD=15.68). The mean reading score for all Wisconsin test takers was 53.20 (SD=11.00).

ANCOVA was employed to adjust each group's reading scores for preexisting differences. The test for violation of homogeneity of regression slopes was significant for the Exceptional Education Need (EEN) covariate. The covariate was removed and the test was repeated. The assumption for the remaining covariates was tenable.

Table 3
Tests of Between-Subjects Effects: Reading Comprehension Scores

Source	SS	df	MS	F	p
Prior Knowledge	3132.583	1	3132.583	44.010	.000
Reading Strategy	4095.878	1	4095.878	57.543	.000
African American	12.008	1	12.008	.169	.682
Hispanic	54.894	1	54.894	.771	.381
Economically Disadvantaged	19.739	1	19.739	.277	.599
Female	754.287	1	754.287	10.597	.001
Limited English Proficiency	1.426	1	1.426	.000	.996
Program	668.472	3	222.824	3.130	.026
Error	22706.289	319	71.180		

Note: Computed using alpha = .05. R Squared = .551 (Adjusted R Squared = .537)

The adjusted reading scores with 95% confidence intervals are depicted in Figure 1. The ANCOVA revealed a statistically significant difference F(3,330)=3.130, p=.026 for the main effect of group (see Table 3). Pair-wise comparisons showed a significant reading advantage for SAGE students (M=53.90) over Title I students (M=47.67) at the 0.05 alpha level.

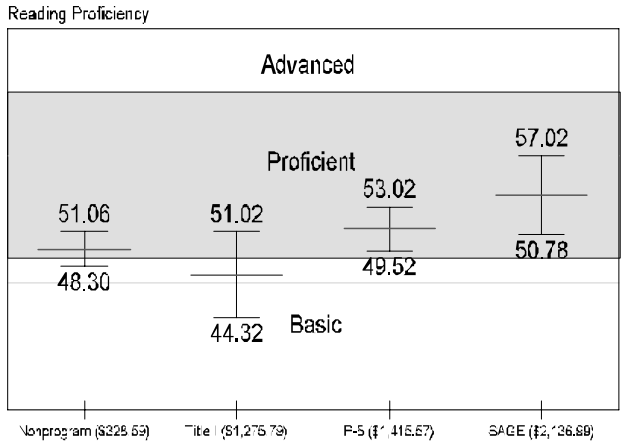

Figure 1. 95% confidence intervals for the adjusted reading comprehension scores (per-student cost).

Effect size was calculated by dividing the adjusted mean reading comprehension score difference between each program group and the Nonprogram group by the averaged standard deviation of the groups (see Table 4). The SAGE effect size (+0.47) is small by Cohen's (1988) guidelines.

Table 4
Adjusted Reading Comprehension Scores

	M	SD	ES	WI Proficiency Standard
SAGE	53.90	8.99	+0.47	Proficient
P-5	51.27	9.36	+0.18	Proficient
Title I	47.67	8.68	-0.22	Basic
Nonprogram	49.68	8.99	-------	Proficient

Note: ES= Effect Size

SAGE was the most cost-effective program for affecting performance on the WRCT. However, the similar performance of the P-5 and Nonprogram groups reduces the practical significance of this finding. The cost for students to improve one point as the consequence of SAGE was $506.40. The cost to improve one point because of P-5 was $890.30. Title I was the least cost-effective program ($1,273.78) for improving performance on the WRCT.

Discussion

Wisconsin's SAGE program was designed to improve student achievement by connecting smaller classes to supporting reform initiatives. High per-student costs and similar performance of comparison groups marginalized the achievement benefits realized by the SAGE school. The district also incurred an opportunity cost associated with the reallocation of non-SAGE revenue to help pay for smaller classes, curriculum development, and staff development.

Improving the Cost-Outcome Relationship of SAGE

Policy makers could adjust program design to improve the cost-outcome relationship of SAGE. Implementation could be reserved for high-needs schools and class-size caps at grades 2 and 3 could be expanded from 15 students to 20-25 students. Such adjustments would likely reduce program costs without causing appreciable decreases in student achievement. These recommendations are also aligned with CSR research that shows smaller classes produce the greatest achievement benefits for low-income and minority students at grades K-1.

Certifying the supporting components may also improve the cost-outcome relationship. A statewide survey of SAGE schools showed that class-size reduction requirements were met while limited attention was given to the rigorous academic curriculum and staff development components (Molnar, Smith, Zahorik, Ehrle, Halbach, Palmer, and Schoeller, 1999). Simply reducing class size does little to affect curriculum and instructional practices. Complete implementation of the fortifying components is necessary to maximize the teaching and learning opportunities created by smaller classes.

Lastly, a reemphasis of the "Achievement Guarantee" may focus attention on the whole SAGE concept. A higher-stakes environment created by stakeholder accountability may also produce more teamwork, efficient use of classroom time, and ownership of outcomes. An evaluation team comprising peer and external members may be formed to review performance, suggest improvements, and make accountability-based judgements about program participation.

Future Research

Continued experimentation is necessary to decide whether systematic fortification of reduced class size can boost achievement benefits to cost-effective levels. A statewide comparison of SAGE schools (certified vs. noncertified) and alternative programs would provide value-added evidence of CSR fortification. Such a study should include analysis of costs, individual- and classroom-level achievement data, teacher quality, and persisting and nonpersisting students. The study could also explore how smaller classes combine with supporting components and contextual factors to affect student achievement.

References

Anderson, L. W. (2000). Why should reduced class size lead to increased student achievement? *The CEIC Review*, *9* (2), 6-7.

Berliner, D. C., and Biddle, B. J. (1995). *The manufactured crisis: Myths, fraud, and the attack on America's public schools*. White Plains, NY: Longman.

Betts, J. R., and Shkolnik, J. L. (1999). The behavioral effects of variations in class size: The case of math teachers. *Educational Evaluation and Policy Analysis*, *21* (2), 193-213.

Bohrnstedt, G. W., and Stecher, B. M. (Eds.). (1999). *Class size reduction in California: Early evaluation findings, 1996-1998*. Palo Alto, CA: American Institutes for Research.

Brewer, D., Krop, C., Gill, B. P., and Reichardt, R. (1999). Estimating the cost of national class size reductions under different policy alternatives. *Educational Evaluation and Policy Analysis*, *21* (2), 179-192.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cooper, H. M. and Lindsay, J. J. (1998). Research synthesis and meta-analysis. In L. Bickman and D. J. Rog (Eds.), *Handbook of applied social research methods* (pp. 315-338). Thousand Oaks, CA: Sage.

Finn, J. D., and Achilles, C. M. (1999). Tennessee's class size study: Findings, implications, misconceptions. *Educational Evaluation and Policy Analysis*, *21* (2), 97-109.

Hanushek, E. A. (1999). Some findings from an independent investigation of the Tennessee STAR experiment and from other investigations of class size effects. *Educational Evaluation and Policy Analysis*, *21* (2), 143-163.

Hruz, T. (2000). *The costs and benefits of smaller classes in Wisconsin: A further evaluation of The SAGE Program*, *13* (6). Thiensville, WI:Wisconsin Policy Research Institute, Inc.

Kozol, J. (1991). *Savage inequalities: Children in America's schools*. New York, NY: Harper Collins.

Krueger, A. B., and Whitmore, D. M. (1999, April). *The effect of attending a small class in the early grades on college attendance plans*. Princeton, NJ: Princeton University.

Mirel, J., and Angus, D. (1994). High standards for all: The struggle for equality in the American high school curriculum, 1890-1990. *American Educator*, *18* (2), 4-9.

Mitchell, D. E., and Beach, S. A. (1990). How changing class size affects classrooms and students. *Policy Briefs: Far West Laboratory*, *12*, 1-4.

Mitchell, D. E., Beach, S. A., and Badarak, G. (1989). Modeling the relationship between achievement and class size: A re-analysis of the Tennessee Project STAR data. *Peabody Journal of Education*, *67* (1), 34-74.

Molnar, A., Smith, P., Zahorik, J., Ehrle, K., Halbach, A., Palmer, A., and Schoeller, B. (1999, December). *1998-99 Evaluation Results of the Student Achievement Guarantee in Education (SAGE) Program*. Milwaukee, WI: University of Wisconsin - Milwaukee, School of Education.

Molnar, A., Smith, P., Zahorik, J., Palmer, A., Halbach, A., and Ehrle, K. (1999). Evaluating the SAGE program: A pilot program in targeted pupil-teacher reduction in Wisconsin. *Educational Evaluation and Policy Analysis*, *21* (2), 165-177.

Molnar, A., Smith, P., Zahorik, J., Halbach, A., and Ehrle, K., Hoffman, L.M., and Cross, B. (2001, December). *2000-01 Evaluation Results of the Student Achievement Guarantee in Education (SAGE) Program*. Milwaukee, WI: University of Wisconsin - Milwaukee, School of Education.

National Center for Education Statistics. (1999). *Digest of education statistics, 1998* (NCES 1999-032). Washington, DC: U.S. Government Printing Office.

Nye, B., Hedges, L. V., and Konstantopoulos, S. (1999). The long-term effects of small classes: A five-year follow-up of the Tennessee class size experiment. *Educational Evaluation and Policy Analysis*, *21* (2), 127-142.

Odden, A. (1990, Summer). Class size and student achievement: Research-based policy alternatives. *Educational Evaluation and Policy Analysis*, 213-227.

Pate-Bain, H., Boyd-Zaharias, J., Cain, V. A., Word, E.,& Binkley, M. E. (1997). *The student/teacher achievement ratio (STAR) project: STAR follow-up studies*. Lebanon, TN: Health and Education Research Operative Services.

Pate-Bain, H., Fulton, B. D., and Boyd-Zaharias, J., (1999). *Effects of class-size reduction in the early grades (K-3) on high school performance*. Lebanon, TN: Health and Education Research Operative Services.

Pong, S., and Pallas, A. (2001). Class size and eighth-grade math achievement in the United States and abroad. *Educational Evaluation and Policy Analysis*, *23* (3), 251-273.

Popham, J.W. (1993). *Educational evaluation* (3rd ed.). Needham Heights, MA: Allyn and Bacon.

Rossi, P. H., Freeman, H. E., and Lipsey, M. W. (1999). *Evaluation: A systematic approach* (6th ed.). Thousand Oaks, CA: Sage.

School District. (1999a). *Performance report, 1998-99*. Beloit, WI: Author.

School District. (1999b). *SAGE cost analysis, 1998-99*. Beloit, WI: Author.

Stasz, C. and Stecher, B. (2000). Teaching mathematics and language arts in reduced size and non-reduced size classrooms. *Educational Evaluation and Policy Analysis*, *22* (4), 313-330.

U.S. Department of Education. (1999, August 19). *Highlights from the baby boom echo: No end in sight*. Washington, D.C.: Author.

Varble, M. E. (1990). Smaller class size = higher achievement scores? *Contemporary Education*, *62* (1), 38-45.

Wisconsin Department of Public Instruction. (1999). *Wisconsin reading comprehension test: Test results interpretive guide*. Madison, WI: Author.

General Information

The 2002 MWERA Annual Meeting will be held **Wednesday, October 16 through Saturday, October 19,** at the Westin Great Southern in Columbus Ohio. The program will consist primarily of presentations, selected through a peer review process, by divisional program chairpersons. In addition, there will be invited speakers and symposia, panel discussions, special sessions for graduate students and new faculty, a luncheon and other social events open to all attendees.

Proposals may be submitted either on paper or electronically over the World Wide Web. Any proposal submitted on paper must be submitted to the Program Chair, but must indicate by which Division it should be reviewed. Proposals must follow the *Guidelines for Submitting a Proposal* in this booklet. Questions about a proposal or the meeting, whether submitted on paper or electronically, should be directed to the Program Chair:

Dr. A. William Place
MWERA-2002 Program Chair
300 College Park
University of Dayton
Dayton, OH 45469-0534

Office: (937) 229-2640 or 835-5691
e-mail: jfhswplace@mdeca.org

Electronic proposals must be submitted using the form available on the meeting Web site. Proposals e-mailed to the Division Chairs or Program Chair will not be processed. Further, each proposal should only be submitted once in one format, electronic or paper. While, no advantage is given in selection, electronic submissions are easier for all and are preferred. Specific instructions for electronic submission can be found at the meeting web site:

http://etra.cedu.niu.edu/mwera/

Any educational professional may submit a proposal for MWERA-2002, whether or not that person is currently a member of MWERA. *All Annual Meeting presenters must be members in good standing of MWERA (non-members must join MWERA upon notification of proposal acceptance).* To promote broader participation in the program no one person should appear as a presenter on more than three proposals.

All proposals, regardless of submission format (electronic or paper), must be received by the Program Chair no later than the deadline of **May 1, 2002**. Submissions will then be sent to Division Chairs and each Division Chair will coordinate a number of volunteers in a system of blind (without author identification) review. Appropriate criteria, depending on the format and type of scholarly work being presented, have been developed and are used for the review process. These criteria include: (a) topic (originality, choice of problem, importance of issues); (b) relevance of topic to the Division and MWERA membership; (c) contribution to research and education; (d) framework (theoretical/conceptual/practical, rationale, literature review, grounding); (e) analyses and interpretations (significance, implications, relationship of conclusions to findings, generalizability or usefulness); and (f) overall written proposal quality (clarity of writing, logic, and organization).

Papers presented at MWERA are expected to present original scholarship, conducted by the author(s), which has not been previously presented at any other meeting or published in any journal. Further, it is a violation of MWERA policy to promote commercially available products or services (except as Exhibits) which go beyond the limits of appropriate scholarly/scientific communication. Individuals who wish to display educationally related products or services are encouraged to contact Dr. Sharon McNeely, Assistant Program Chair for Exhibits, P. O. Box 34421, Chicago, Illinois 60634, (913) 794-2788.

All persons presenting at the 2002 Annual Meeting are expected to register for the full meeting. All sessions listed in the program will be open to any registered meeting participant; however, enrollment may be limited, and a small additional fee required, for some Workshop sessions. Tickets for the Friday luncheon and speaker are available to all pre-registrants. *Ticket availability is not guaranteed for late and on-site registrants*. Registration materials for the 2002 Annual Meeting will be published in the *Mid-Western Educational Researcher*, on the Web site, and can be obtained by contacting the Program Chair.

Presenters whose papers have been accepted to a session with a Session Chair and/or Session Discussant are responsible for submitting a completed version of their conference paper to the Session Chair and Discussant no later than September 20, 2002. *Papers not available to the Session Chair and Session Discussant may be dropped from the program.* Presenters must also provide complete copies of their papers (or detailed handouts) to attendees at their sessions. Overhead projectors and screens will be provided by MWERA in most presentation rooms. Presenters needing additional A/V equipment are responsible for arranging such with the hotel at the presenter's own additional expense.

MWERA reserves the right to reproduce and distribute summaries and abstracts of all accepted proposals, including making such works available in a printed Program Abstract, through the meeting's World Wide Web site, and in press releases promoting the Annual Meeting and the organization. *As a condition of acceptance all authors of papers accepted to the 2002 Annual Meeting explicitly grant MWERA the right to reproduce their work's summary and/or abstract in these ways.* Such limited distribution does not preclude any subsequent publication of the work by the author(s).

Authors of accepted proposals assume the ethical and professional responsibility to appear at the Annual Meeting and to participate in their presentation or assigned session. When circumstances preclude the author(s) from doing so, it is the responsibility of the author to arrange a suitable substitute and to notify the Program Chair in advance.

Divisions*

A - Administration and Leadership
This division is concerned with research, theory, development, and the improvement of practice in the organization and administration of education.

B - Curriculum Studies
This division is concerned with curriculum and instructional practice, theory, and research.

C - Learning and Instruction
This division is concerned with theory and research on human abilities, learning styles, individual differences, problem solving, and other cognitive factors.

D - Measurement and Research Methodology
This division is concerned with measurement, statistical methods, and research design applied to educational research.

E - Counseling and Development
This division is concerned with the understanding of human development, special education, and the application and improvement of counseling theories, techniques, and training strategies.

F - History and Philosophy
This division is concerned with the findings and methodologies of historical research in education.

G - Social Context of Education
This division is concerned with theory, practice, and research on social, moral, affective, and motivational characteristics and development, especially multicultural perspectives.

H - School Evaluation and Program Development
This division is concerned with research and evaluation to improve school practice, including program planning and implementation.

I - Education in the Professions
This division is concerned with educational practice, research, and evaluation in the professions (e.g., medicine, nursing, public health, business, law, and engineering).

J - Postsecondary Education
This division is concerned with a broad range of issues related to two-year, four-year, and graduate education.

K - Teaching and Teacher Education
This division is concerned with theory, practice, and research related to teaching at all levels and in-service and pre-service teacher education, including field experience supervision and mentoring.

* Division Chairs will be announced after the 2001 meeting.

Important Dates

Proposal Submission Deadline	**May 1, 2002**
Notification of Acceptance	July 15, 2002
Papers to Session Chairs/Discussants	September 20, 2002
Meeting Registration and Hotel Reservations	September 24, 2002
MWERA 2002 Annual Meeting	October 16-19, 2002

Guidelines for Submitting a Proposal

Session Format Descriptions

Paper Presentation

Paper sessions are intended to allow presenters the opportunity to make short, relatively formal presentations in which they overview their papers to an audience. Three to five individual papers dealing with related topics are grouped into a single session running from 1.5 to 2 hours. The presenter(s) of each paper is(are) allowed approximately 15 minutes to present the highlights of the paper. A single Session Discussant is allowed approximately 15 minutes, following all papers, for comments and critical review. A Session Chair moderates the entire session. Presenters are expected to provide complete copies of their papers to all interested audience members.

Roundtable Discussion/Poster

Roundtable Discussion/Poster sessions are intended to provide opportunities for interested individuals to participate in a dialogue with other interested individuals and the presenter(s) of the paper. Presenters are provided a small table around which interested individuals can meet to discuss the paper. Presenters may elect to provide small, table-top poster-type displays, ancillary handouts, or other table-top A/V materials to augment their discussions. Interested individuals are free to move into and out of these discussions/posters as they wish. Presenters are expected to make available complete copies of the paper on which the roundtable discussion/poster was focused.

Symposium

A symposium is intended to provide an opportunity for examination of specific problems or topics from a variety of perspectives. Symposium organizers are expected to identify the topic or issue, identify and ensure the participation of individual speakers who will participate in the session, prepare any necessary materials for the symposium, and Chair the session. It is suggested, though not required, that the speakers or symposium organizer will provide interested individuals with one (or more) papers relevant to, reflective of, or drawn from the symposium.

Workshop

Workshops are intended to provide an extended period of time during which the workshop leader helps participants develop or improve their ability to perform some process (e.g. how to provide clinical supervision, using the latest features of the Internet, or conduct an advanced statistical analysis). Organizers may request from 1.5 to 3 hours, and are responsible for providing all necessary materials for participants. Many workshops are scheduled for Wednesday afternoon, although others may be scheduled throughout the conference. Organizers may, if they wish, receive an honorarium based upon the number of paid participants in their workshop and the fee schedule.

Alternative Session

The form, topics, and format of alternative sessions are limited only by the imagination and creativity of the organizer. These options are intended to afford the most effective method or approach to disseminating scholarly work of a variety of types. Proposals for alternative sessions will be evaluated on their appropriateness to the topic and audience, their suitability to meet the limitations of time, space, and expense for MWERA, and the basic quality or value of the topic. The organizer of alternative sessions is responsible for all major participants or speakers, developing and providing any necessary materials, and conducting or mediating the session. Because a variety of approaches may be proposed within this category, alternative session proposals should include a brief rationale for the alternative being proposed.

Best Practices Forum

The "Best Practices" sessions are intended to provide opportunities for individuals or groups to present "best" or "promising" practices impacting both K-12 and higher education. These sessions highlight unique and innovative programs that have demonstrated promise for improving and enhancing educational practice. Presenters will be grouped by similar topics to facilitate discussion between and among the groups and audience. Presenters are expected to make available complete copies of the paper on which the "Best Practices" session focused.

Materials to be Submitted

The following materials list applies to proposals submitted on paper. Separate guidelines exist for electronically submitted proposals (see the Web site for details).

Proposal Cover Sheet

Six (6) copies typewritten with all items completed. Session descriptors must be chosen from the list of descriptors provided (see table to the right).

Summary

Six (6) copies of a two to three page summary for use in judging the merits of the proposal. Summaries can be single-spaced, but must be typed on 8.5" x 11" paper in no smaller than 10-point type using 1" margins. All copies of the summary should include the title of the proposed session in the upper left-hand corner of the first page. On three of the summaries only include the name of the presenter, with his or her complete mailing address, telephone and FAX, and e-mail, in the upper right hand corner of the first page. Proposals, which do not meet these criteria, may be refused by the Program Chair without review.

Summaries for **Paper** and **Roundtable Discussion/Poster** proposals should explicitly address as many of the following as appropriate, preferably in this order: (1) Objectives, goals, or purposes; (2) Perspective(s) and/or theoretical framework; (3) 0Methods and/or techniques (data source, instruments, procedures); (4) Results and conclusions; and (5) Educational and/or scientific importance of the work.

Summaries for **Symposium, Workshop, and Alternative Session and Best Practices Forum** proposals should explicitly address as many of the following as appropriate, preferably in this order: [1] Descriptive title of the session; [2] Objective, goals and purposes of the session; [3] Importance of the topic, issue, or problem; [4] Explanation of the basic format or structure of the session; [5] Listing of the Presenter and Co-Presenter(s), with an explanation of each person's relevant background and role in the session; [6] Anticipated audience and kind of audience involvement.

Abstract

Three (3) copies of a 100 - 150 word narrative abstract. The abstracts of accepted papers will be published the *MWERA 2002 Annual Meeting Abstracts* book, and will be available on the World Wide Web site. Abstracts must be typewritten, single-spaced, using a 12 point Arial or Times Roman font. Use clear, precise language, which can be understood by readers outside your discipline. In the upper left hand corner of each abstract page type the title of the paper, and the name and institutional affiliations of each author.

Envelopes

Four (4) stamped, self-addressed, business size (#10) envelopes. These will be used to inform you of: (a) receipt of the proposal by the Program Chair; (b) the decision about your paper's acceptance; (c) your scheduled session time, Session Chair, and Session Discussant, and; (d) meeting registration and hotel reservation information.

Session Descriptors

Ability Grouping
Accountability
Accreditation
Achievement
Action Research
Adaptive Testing
Administration
Admissions
Adolescence
Adult Education/Development
Affective Education
Aging
Anthropology
Aptitude
Artificial Intelligence
Arts Education
Asian Education
Assessment
At-Risk Students
Attitude
Attribution
Bilingual/Bicultural
Black Education
Business Education
Career Development
Case Studies
Certification/Licensure
Child Development
Classroom Management
Classroom Research
Clinical Education
Cognition
Cognitive Processes/Develop
Collaboration
Community Colleges
Comparative Education
Compensatory Education
Comprehension
Computer Applications
Computerized Testing
Computers and Learning
Conceptual Change
Constructivism
Continuing Education
Cooperative Learning
Counseling
Counselor Training/Supervision
Critical Theory
Critical Thinking
Cross-Cultural Studies
Curriculum
Data Analysis
Decision Making
Demography
Desegregation
Differential Item Functioning
Dimensionality
Dropouts
Early Childhood
Economics of Education
Educational Policy
Educational Reform
Elementary Schools
Equating
Equity
Ethics
Ethnicity
Evaluation
Experimental Design
Facilities
Factor Analysis
Faculty Development
Family/Home Education
Finance
Gay/Lesbian Studies
Gender Studies
Generalizability Theory
Gifted Education
Governance
High Schools
Hispanic Education
History
Indian Education
Indicators/Information Systems
Individual Differences
Information Processing
Instructional Design/Development
Instructional Practices
Instructional Technology
Intelligence
International Education/Studies
Item Response Theory (IRT)
Language Comprehension/Devel
Language Processes
Law/Legal
Leadership
Learning Environments
Learning Processes/Strategies
Life-Span Development
Literacy
Literature
Mainstreaming
Mathematics Education
Measurement
Media
Medical Education
Memory
Mentoring
Meta-Analysis
Metacognition
Middle Schools
Military Education
Minorities
Moral Education/Development
Motivation
Museum Education
NAEP
Networking
Organization Theory/Change
Peer Interaction/Friendship
Performance Assessment
Philosophy
Physical Education
Planning
Politics
Postsecondary Education
Principals
Private Education
Problem Solving
Professional Development
Program Evaluation
Psychometrics
Qualitative Research
Race
Reading
Research Methodology
Research Utilization
Restructuring
Retention
Rural Education
School/Teacher Effectiveness
Science Education
Self-Concept
Social Class
Social Context
Social Processes/Development
Social Studies Education
Sociology
Special Education
Staff Development
Standard Setting
Statistics
Stress/Coping
Structural Modeling
Student Behavior/Attitude
Student Cognition
Student Knowledge
Student Teaching
Studying
Supervision
Survey Research
Teacher Assessment
Teacher Characteristics
Teacher Cognition
Teacher Education/Development
Teacher Knowledge
Teacher Research
Teaching Context
Technology
Testing
Test Theory/Development
Textbooks
Tutoring
Urban Education
Validity/Reliability
Vocabulary
Vocational Education
Women's Issues
Work
Writing

Proposal Submission Cover Sheet (All Session Types)
Mid-Western Educational Research Association 2002 Annual Meeting
October 16-19, 2002 Columbus, Ohio

Presenter's Name: _____
(First Name) (Middle Initial) (Last Name)

Affiliation: _____

Mailing Address: _____

_____

Telephone: ( ) _____ FAX: ( ) _____

E-mail: _____

Are you a member of MWERA? ❑ Yes ❑ No *(Reminder: If your proposal is accepted and you are not a member, you will need to join!)*

Are you a graduate student? ❑ Yes ❑ No *(Student presentations are automatically entered in the annual competition/prize contest!)*

Co-Presenter(s)/Co-Author(s) Name	Affiliation

Title of Submission: _____

_____

Division	**Desired Session Type** 1st Choice	2nd Choice	**Workshop Detail** (Workshop Proposals Only)	**Session Descriptors** (From Prior Page Only)
❑ A ❑ E ❑ I	❑ Paper	❑ Paper	❑ 1 Hour Maximum	_____
❑ B ❑ F ❑ J	❑ Roundtable	❑ Roundtable	❑ 1.5 Hours enrollment of	
❑ C ❑ G ❑ K	❑ Symposium	❑ Symposium	❑ 2 Hours _____	_____
❑ D ❑ H	❑ Workshop	❑ Workshop	❑ 2.5 Hours persons at	
❑ Cross-List (indicate):	❑ Alternative Session	❑ Alternative Session	❑ 3 Hours $_____ per	_____
❑ Best Practices Forum				

By submitting this proposal I hereby certify that: (1) this proposal is original scholarship written and conducted by the author(s); (2) this proposal has not been previously submitted to MWERA either on paper or in electronic form; (3) this submission has not been previously published or presented at any other professional meeting; and (4) if this submission is accepted and placed on the program I will register for the full MWERA-2002 meeting, attend the conference, and deliver this presentation at the assigned date & time.

Signature: _____

Six (6) copies of this Proposal Submission Cover Sheet, typewritten, with all items completed
Six (6) copies of a two to three page Summary: three (3) copies with author information, three (3) copies without author information

Three (3) copies of a 100 - 150 work narrative Abstract, typewritten, in 12 point Arial or Times Roman font
Four (4) stamped, self-addressed, business size (#10) Envelopes

THE COMPLETE PROPOSAL SUBMISSION MUST BE RECEIVED BY THE PROGRAM CHAIR NO LATER THAN MAY1, 2002!

Broadening and Changing Horizons: Still Pursuing Diversity

MWERA 2002
CALL FOR PROPOSALS
Broadening and Changing Horizons: Still Pursuing Diversity
October 16-19, 2002 Columbus, Ohio

The Mid-Western Educational Research Association is broadening and changing our horizons—moving to Columbus, Ohio for the 2002 meeting.

We hope to reduce expenses for members and still provide graduate students and new faculty a quality forum to interact with the best and the brightest in our field. Come to Columbus and together we can maintain and improve MWERA as the best regional research association in AERA. Diversity of all kinds has always been a goal of MWERA and this year's theme reminds us that it is and will continue to be important to our organization.

The Great Southern Hotel—Columbus, Ohio

The Mid-Western Educational Research Association's

Annual Meeting

October 16-19, 2002

The Great Southern Hotel – Columbus, Ohio

Broadening and Changing Horizons : Still Pursuing Diversity

The 2002 Annual Meeting of Mid-Western Educational Research Association has planned an exciting program of invited speakers, focused workshops, and paper presentations intended to generate discussion concerning education and educational research as we begin making a difference in the 21st century. Please join us and . . .

Look for us on the World Wide Web!

http://etra.cedu.niu.edu/mwera/

This WWW site provides conference information, including registration information, hotel reservations, information about invited speakers, and abstracts of accepted presentations, along with links to the many highlights that the city of Columbus has to offer.

Featured Speakers

Dr. Maria Luisa Gonzalez

Dr. María Luisa González is full professor and academic department head of educational administration in the College of Education at New Mexico State University (NMSU). Prior to joining the faculty at NMSU, she held various positions in the public schools: teacher, bilingual teacher leader, bilingual statewide teacher trainer and coordinator, curriculum specialist, research evaluator, and inner city school principal in Dallas, Texas. The last school in which she served received congressional recognition for its work with homeless students. She has also consulted for the New Mexico Department of Education, conducted a validation study of the Spanish/English High School Competency Exam, coordinated the Leadership Academy for Region XIX Educational Service Center in Texas, and evaluated federal programs for districts in New Mexico.

González has been active in national and state organizations. She is immediate past president of the University Council of Educational Administration (UCEA), has been a State of New Mexico Commissioner, Executive Director for New Mexico Association of Supervision and Curriculum Development (ASCD), and director of the NMSU Principals' Center. She has served on the National Board for the Education of Homeless and Runaway Youth, an appointment made by the U.S. Department of Education. She was also appointed to the International Board of Directors for ASCD and was selected to serve as part of its nominating committee in 1999. She served two terms as a board examiner for the National Council for the Accreditation of Teacher Education (NCATE) and is a member of the editorial boards for the *Journal of School Leadership Educational Administration Quarterly* and *Journal of Cases in Educational Administration.*

Her research has focused on the education of marginalized groups, including homeless children, children of undocumented workers, children for whom English is a second language, and administrators working with minority populations. Her work has been widely published in education journals and she has written chapters and monographs for edited books in English and Spanish. Her research has also sought to raise an awareness of administrators' roles in supporting bilingual programs. She co-edited a book published in 1997 in response to the need for K-12 educators, who are not prepared in bilingual education, to understand their roles in addressing the needs of the growing numbers of Latino students and their families.

González has received the New Mexico State University Donald C. Roush Excellence in Teaching Award, the College of Education Dean's Service Award, as well as the Excellence in Education Award from the New Mexico ASCD. In 1994, the Governor's Commission on the Status of Women selected her as one of the Outstanding New Mexico Women.

Dr. Cynthia A. Tyson

Dr. Cynthia A. Tyson is Assistant Professor of Language, Literacy, and Culture at The Ohio State University, where she is currently teaching social studies, global education, and literacy courses to pre-service and in-service teachers. Her research interests fall within a social-justice framework. She is exploring using children's literature about contemporary events to increase engagement, literate behaviors, and simultaneously move readers toward personal, civic, and communal socio-political awareness and action. She received her master's degree in reading from The Ohio State University in 1991 and her bachelor of science in elementary education. For seven years, she has worked in multicultural staff development and is a community social activist. She has published articles in *Education Researcher* and *Theory Into Practice*.

"From Hegemony to Liberation: Educational Research in the 21st Century"

Special Highlights

** Division Meetings with Invited ** Speakers

Many MWERA Divisions will feature an invited speaker as part of the annual Division meetings.

** Fireside "Chat" with ** Maria Luisa Gonzalez, Ph.D.

Join Dr. Gonzalez for wine, cheese, and conversation.

** A Workshop on the **
"100 Languages of Children"

This workshop will present a brief overview of the Reggio Emilia approach to early childhood education. A visit to C.O.S.I. to view the "100 Languages of Children" will be part of this workshop. Participants will learn about the innovative early childhood programs of Reggio Emilia, Italy, cited as the best preschools in the world by experts from all branches of education. Reggio sees children as powerful beings who have independent ideas and abilities. The program supports all the "hundred languages" of children – the expressive, the metaphorical, the symbolic, the cognitive, the logical and the imaginative. This workshop is for educators at all levels interested in exploring the ways children (and ultimately adults) learn.

Graduate Students – Special Topics

A series of informal sessions will be provided for the expressed purpose of developing knowledge and skills in special interest areas for graduate students and new faculty members. Topics may include publish or perish, grant writing, and finding and securing that first faculty position.

Collegiate Connection: A Program to Encourage the Success of Student Participation in High School/University Dual Enrollment

Beverly Parke
Joe Nichols
Ann Souligny Brown
Indiana University—Purdue University

Abstract

This project is a comparative exploration of academic success rates for high school students enrolled in a high school/university dual enrollment program. Four-hundred-eighty-four high school student grades in university courses were compared to grades of the general university population and university freshmen (n = 4,552) in specific courses. In several specific courses, the earned grades of high school students participating in the program were found to be significantly greater than the grades of university freshmen in matching courses. The Collegiate Connection dual enrollment program is explained in detail and suggestions for additional future research are also included.

Introduction

One of the primary challenges facing educators today is the development of flexible programs geared to specific characteristics of student populations. Students often differ from their age-peers with regards to the pace at which they learn, the ability to process information, and the interests they hold. Assembling programs that correspond to these characteristics in a manner that is comprehensive and meaningful has occupied a great deal of discussion in the field of education for many years.

For high school students, there is growing evidence that dual and/or concurrent college enrollment may improve both high school graduation rates and college continuation rates (Puyear, 1998). Although the concept of dual enrollment (in which high school students are simultaneously taking college courses at a local university) is not new, few programs target the high school population using a dual enrollment model. Costs, transportation, potential state revenue loss, and the rigors of advanced level course offerings are among the factors that deter such partnerships.

This longitudinal study was undertaken to determine if a dual enrollment program can lead to a successful experience for the students and university. To this end, data were collected on a number of factors deemed potentially enlightening to the analysis of success in the high school/university dual enrollment model.

This study sought to determine the effectiveness of the dual enrollment model as interpreted in the Collegiate Connection (CC) program at Indiana University—Purdue University Fort Wayne (IPFW) and if there were certain factors that predicted student success. Specifically, the study explored the academic achievement of Collegiate Connection students as compared to the success/failure rates of traditional university freshmen and the general university population. Future analysis of additional data will explore the relationship of the success of Collegiate Connection students to other factors unique to the university population. As we continue this longitudinal exploration, we plan to investigate additional factors including: student gender, SAT scores, class percentile rank, use of IPFW student resources, on campus vs. in high school course location, post-secondary education selection, participation in high school activities, and hours worked in employment situations.

Understanding the connection between dual enrollment programs, future collegiate success, and program support structures will likely enhance the possibility of student success in such programs across the educational spectrum. The result may be a much-needed structure through which students of high ability, talent, and/or motivation can find educational experiences appropriate to their learning needs.

Literature Review

Clayton (1999) has stated that more high school students will be attending college part time in coming years. Their lack of motivation is often due to their home school's failure or inability to offer enrichment programs targeted to their academic needs. Early admission to college or dual enrollment is not a new idea. Some programs have been in existence for more than 25 years (Olszewski-Kubilius, 1995), while others are still in the process of being developed and refined. McCarthy (1999) reported that twenty-two states offer dual enrollment options to high school students according to a 1998 Education Commission of the States report. Twelve states have comprehensive programs in which students pay little or no tuition, credits count toward both college and high school graduation, and there are few admission restrictions.

Program Structures

Dual enrollment programs can take on a variety of forms. In each of the models below, students may earn only high school credit, only college credit, or both high school and college credit. The awarding of credit varies from state to state, and school district to school district. Models include:

1. A university credentialed high school teacher using a college syllabus teaches the college course at the high school during the school day (Puyear, 1998);

2. The college course taught at the high school by a university professor/instructor who is not a high school teacher (Puyear, 1998);

3. The college course taught at the university where high school students are mixed with other university students (Cullen and Moed, 1988; Crossland, 1996; Greenberg, 1991; Katz and Fisher, 1991; Puyear, 1998);

4. The college course taught by a university professor/ instructor at the college, but only high school students are in the class (American Association of Community Junior Colleges, 1991; Puyear, 1998); and

5. University personnel teach the college course via a distance education medium such as via Internet, television, video, correspondence, etc. (McCarthy, 1999).

Student and Program Success

Henry (1997) cited a 1997 study by the Statewide Higher Education Executive Officers' Association that reported 41 of the 44 states responding to their study approved of and promoted high school students participating in post secondary education course work through a concurrent or dual enrollment model. It is surprising, then, that limited quantitative research exists to suggest that dual enrollment students experience similar amounts of success when compared to traditional college students. Several researchers (Chiang, 1998; Clayton, 1999; Galloway, 1994; Evelyn, 1998; and Windham, 1997) have suggested that dual enrollment students can experience success in college course, while others (Koelling, 1997; Smith, 1999) suggest caution in allowing students these opportunities.

Data available from a variety of programs across the nation support the premise that students in dual enrollment programs can be successful. At the University of Minnesota–Twin Cities campus, dual-enrolled students earned an average GPA of 3.1 while the college average was 2.7 (McCarthy, 1999). In Oregon, a 1993 study, conducted by the Oregon Department of Education, revealed that the mean GPA of college freshmen who had participated in dual-enrollment programs was 3.53 as compared with other first-time, first-year students of 3.21 (Smith, 1999). The average GPA of the University of Washington's *Running Start* students was approximately 2.8, nearly the same as the average of regular college freshmen (Crossland, 1994). University of Washington research data also showed that *Running Start* students, who transfer to the university, continue to be very successful when compared to regular entering freshmen students. They earn higher grade point averages and take higher credit hour loads than regular entering freshmen or other transferring students (Crossland, 1994).

Motivation and Benefits

Students, their parents, and college administrators who participate in dual credit programs report many benefits. Among these are: (a) reduced amount of time students spent in college; (b) college costs saved by the family; (c) lines of communication opened between high schools and colleges (Crossland, 1996; Greenberg, 1988, 1991); (d) colleges able to add sections of existing classes (AACJC, 1991; Crossland 1996); (e) a cure for senior boredom; (f) parents who might have doubted the ability or motivation of their child to successfully cope with college-level study have a chance to learn how prepared their children really are (Greenberg, 1988, 1991); and (g) challenging students while still allowing them to participate in their high school activities and socialize with their peers (Reiss and Follo, 1993).

Dual enrollment programs also provide high school students with the opportunity to compare their capabilities and talents with those of regular college students. Students experience the process of negotiating normal college routines and procedures, such as registration, buying textbooks and becoming familiar with a college vocabulary (electives, credits, concentration), thus increasing their knowledge of the college organization, services and academic requirements. Although these are secondary aspects of a dual enrollment program, they provide a solid foundation for future success in college (Katz and Fisher, 1991).

Students report (Crossland, 1991) very particular reasons for seeking out and enrolling in dual enrollment programs. The most frequently cited reasons high school students gave for selecting dual credit were:

a. earning credits to apply to their college educations;

b. saving costs for college courses; and

c. learning dual credits by getting high school credit for college courses.

These practical reasons for considering dual enrollment programs correspond neatly with those reported by parents and sponsoring post-secondary educational institutes (Chiang, 1998; Clayton, 1999; Crossland, 1991; Reiss and Follo, 1993). This meshing of purposes is one fundamental reason suggesting the potential for program success.

Enrollee High School Achievement

While many dual enrollment programs are targeted at academically high achieving students, two of New York's programs work with a different student base. *Bridge* is aimed at moderate-achieving students and *Middle College High School* works with low-achieving students. These programs have demonstrated that low- or moderate-achieving students can also be successful in college. Students in both programs

averaged college GPAs of C+ (Greenberg, 1988). Additional data available through the Minnesota Department of Education indicates that dual-enrollment participants do not have to be in the top 10% of their class. Sixty percent were B, C, and D students in high school, yet more than half of those participating received a grade of A or B in their college courses (McCarthy, 1999).

Cautions

Although preliminary research supports dual enrollment, even supporters suggest caution in allowing some students these opportunities. Others question the removing of barriers between high school and college experiences. Koelling (1997) was concerned that dual credit programs will devalue education and that blurring the lines between high school and college will be an injustice to both organizations. He specifically was concerned about the dual enrollment model in which the high school teacher is credentialed by the local college and teaches the course. Koelling pointed out that credentialing high school teachers may be a way for the universities to raise the number of students attending their institutions and increase revenues through more tuition dollars. Another concern expressed was a fear that colleges will lower placement standards in order to qualify more students for courses.

Some institutions such as Brigham Young, Notre Dame, Rice, Colorado College, and the University of Southern California do not accept dual credit, particularly if the program is held at the high school and taught by a high school teacher serving as an adjunct college instructor. Such dual enrollment programs may not be closely supervised and do not provide college level instruction (Schwalm, 1991). These unsupervised programs have weakened the transferability of credits to some institutions. Other colleges have dealt with this problem by revamping their dual credit program (Vivion, 1991).

Lieb (1999) reported that Arkansas legislators have recently expressed concern about the quality of college-credit courses taught in high schools and the practice of providing state funding to both high schools and colleges for the same course. This practice of funding both institutions, "double-dipping," has several states examining the funding aspects of these programs (Koeling, 1997; Lieb, 1999).

Other difficulties may result due to the complexity of educational organizations. For example, a three-credit and a five-credit college science course might be taken by two different students, yet both students might receive the same high school credit (McCarthy, 1999). The displacement of adult students in college courses was another concern expressed by some college administrators (Crossland, 1991). Teachers are also concerned that the best students are leaving high school classrooms. Additionally, some school districts view dual enrollment as a loss of control over both budget and curricular decisions, and a potential loss of revenue (McCarthy, 1999).

Potential social and emotional difficulties for students in early dual enrollment programs must also be examined. Students may miss the extracurricular activities and social experiences of high school such as attending a prom or participating in athletics (McCarthy, 1999; Sayler, 1992). In a rush to help talented children perform academically, and save on college costs, parents might push their children into social environments beyond their years (Clayton, 1999). In addition, early entrants need to be prepared to take more responsibility for their learning and may be unaware of the amount of reading, the level of detail and analysis expected, and the amount of time outside the classroom needed to prepare for university-level course work. Students who have problems managing their time, lack personal organizational skills, or are unmotivated may not succeed in the college arena (Sayler, 1992; Schumacker and Sayler, 1995).

Summary

Overall, the literature supports dual enrollment structures for high school students. Studies of such programs universally show these students do as well or better than students entering at the traditional college age (Crossland, 1991). Early entrance to college, whether it is through early admission, dual credit, or dual enrollment, provides academically advanced students with a viable educational choice. Students are provided with an intellectual challenge and stimulating environment (Sayler, 1992). At present, the majority of the programs only admit the top third of a high school class or students who have been identified as gifted. Most of these students have exhausted or will soon exhaust the advanced course work available at their sending high school.

Dual enrollment programs provide exceptionally able, well-motivated high school students the academic acceleration and enhanced social development they need. Many go on to graduate or professional schools and for those whose career paths lead to them to becoming physicians or majoring in more than one area, saving a year or two can be especially helpful. Even more important, however, is that accelerated programs prevent boredom and strengthen academic motivation (Boothe, Sethna, Stanley and Colgate, 1999).

The Collegiate Connection Program, sponsored by Indiana University—Purdue University Fort Wayne and neighboring local school agencies is one program that approaches this challenge with success. Over the past four academic years, IPFW has worked in coordination with area school district personnel to build a dual enrollment program through which high achieving students attend university classes and receive college credit while concurrently enrolled at their local high schools. To date, over 400 students from 27 different public and private high schools in the Fort Wayne metropolitan area have completed course work in ninety three different IPFW courses alongside traditional university students.

Purpose for the Study

The central purpose of this initial segment of the longitudinal study focused on the academic achievement of the Collegiate Connection Program participants. Academic achievement of Collegiate Connection students, as measured by grade point average (GPA), was analyzed and compared to the success/failure rates of traditional university freshmen and to the general university population.

Method

Program Description

Indiana University—Purdue University Fort Wayne (IPFW) piloted the Collegiate Connection, a dual enrollment program, with a single high school in the spring semester of 1997. The program was designed to meet the needs of a growing population of students who were completing their high school requirements early and needing additional challenges. Collegiate Connection was also aimed at first generation college students, many of whom are from minority backgrounds, and who may not have considered it feasible or necessary to attend college.

Collegiate Connection students are conditionally admitted to IPFW and attend university courses on campus. For admission into the program, eleventh and twelfth grade students must be in the top third of their high school class academically, or in the top half with a letter of recommendation from their guidance counselor. Occasionally exceptions have been made for younger students in need of accelerated course options. Students may attend a special orientation session designed to assist them in making the transition from high school to university life. The orientation emphasizes college survival skills, what professors expect, and the special university services available to them. Midway through the semester a form and note of explanation is sent to each student's instructor checking on academic progress. This is usually the first time the instructor learns there are high school students in the class. If the student is performing at less than a C level, the IPFW program coordinator contacts the student and options such as tutoring, talking with the instructor, peer study groups or possible withdrawal are discussed.

Students in need of financial assistance can receive special private funding obtained through a local foundation. Any student who qualifies for free and/or reduced textbooks or lunches may take up to two classes per semester tuition-free. The student is responsible for transportation and books only.

Students are then dually enrolled in both high school and college and receive university credit while they complete their high school requirements. As of fall 2001, students were enrolled from nine northeastern Indiana counties and enrolled in classes ranging from English composition, psychology, and speech courses to advanced third-year foreign language courses, linear algebra and graduate statistics.

The University Setting

Indiana University—Purdue University Fort Wayne (IN) is an urban state-assisted institution serving Indiana's second largest city and the surrounding region. It is the only comprehensive university in northeastern Indiana and offers 170 diverse academic programs resulting in certificate, associate, baccalaureate, and master's level degrees. The total undergraduate and graduate student population is traditionally around 10,000 students for the fall and spring semesters. Typically half of these students are full time. The average student's age at IPFW is 27 years old. IPFW is a commuter campus with no on-campus student housing.

Student Participants

High school students entering the program tend to live within a one hour driving distance from the campus. The majority of Collegiate Connection students are enrolled in the Fort Wayne Community Schools, an urban school district. Other students attend a wide variety of public, private, and parochial schools located in rural, suburban, and urban settings. While most students are ranked in the top third of their high school class, some students have been ranked as low as the eleventh percentile of their graduation class. Composite SAT scores also represent a wide spectrum ranging from a low of 710 to a high of 1,560 (out of 1600 possible) with the majority reporting composite scores above 1,000.

For this study, 484 course-grade data points were analyzed from those earned by (male participants = 212, female participants = 272) Collegiate Connection students over the past 5 semesters. These course grades were compared to grades matching course grades from university freshmen and non-freshmen (registered sophomores through seniors) completing the most recent university semester (Spring, 2000; n = 4,552). University instructors were not aware of specific students attending their classes under the Collegiate Connection dual enrollment program until the midterm grade checks were sent out.

Results

In an effort to determine how successful the Collegiate Connection (CC) students were in comparison to the college level students taking the same course, average grades in the course for CC students were compared to average grades of IPFW freshmen and non-freshmen. Table 1 offers descriptive statistics of mean grades earned for Collegiate Connection, university freshmen, and university non-freshmen students. In this table, the data has been collapsed into general content categories for comparative purposes. Notes following this table indicate individual courses that constitute the collapsed content areas.

Due to the small overall Collegiate Connection student enrollment in some courses, it was decided to include only the courses where Collegiate Connection enrollment totaled

Table 1

Descriptive Statistics for Collegiate Connection Students, University Freshmen, and General University Population by Collapsed Content Courses

	Collegiate Connection			University Freshmen			University Non-Freshmen		
	x	sd	n	x	sd	n	x	sd	n
English	3.94	1.08	49	3.53	1.24	617	4.00	1.07	115
History	3.68	1.04	22	2.84	1.26	347	3.30	1.23	277
Math	4.09	1.17	58	3.19	1.33	387	3.34	1.22	151
Science	3.82	1.78	11	3.07	1.23	229	3.41	1.03	242
Political Science	3.94	1.11	18	2.89	1.30	192	3.38	1.24	149
Foreign Language	4.52	0.59	25	na	–	–	na	–	–
Computer Science	4.23	0.73	13	na	–	–	na	–	–
Fine Arts	4.00	1.60	15	na	–	–	4.13	1.23	75
Philosophy	4.37	0.96	19	3.43	1.27	428	3.79	1.18	311
Psychology	3.62	1.20	131	2.78	1.33	722	3.38	1.32	310
Public Affairs	3.38	0.74	8	na	–	–	na	–	–

Notes: Grades based on A = 5, B = 4, C = 3, D = 2, F = 1.
English = (ENG W103, ENG W130, ENG W131, ENG L102, ENG W233)
History = (HIS 105, HIS 106, HIS 113, HIS 114, HIS 216, HIS 232, HIS 210)
Math = (MAT 101, MAT 102, MAT 113, MAT 153, MAT 154, MAT 163, MAT 164, MAT 213, MAT 229, MAT 261, MAT 262, MAT 490, MAT 351)
Science = (AST 105, BIO 100, BIO 295, CHM 115, CHM 290, PHY 131, PHY 152)
Political Science = (POL 103, POL 105)
Foreign Language = (FRN 113, FRN 203, FRN 204, FRN 305, FRN 306, FRN 318, GER 105, GER 113, GER 306, GER 318, GER 470, SPA 203, SPA 204, SPA 210, SPA 311, SPA 312)
Computer Science = (CPS 106, CPS 114, CPS 160, CPS 161)
Fine Arts = (FIN 101, FIN 121, FIN 123, FIN 273, FIN 112, THR 134, THR 201, MUS 113)
Philosophy = (PHL 110, PHL 111, PHL 120, PHL 150, PHL 328)
Psychology = (PSY 120, PSY 240, PSY 350)
Public Affairs = (PEA 101, PEA 321)

Table 2

Descriptive Statistics (Mean Earned Grades) for Collegiate Connection Students, University Freshmen, and General University Population for Individual Courses with Collegiate Connection Enrollment Totaling Greater Than 10 Students

	Collegiate Connection			University Freshmen			University Non-Freshmen		
	x	sd	n	x	sd	n	x	sd	n
PSY 120	3.62	1.21	129	2.78	1.32	642	3.33	1.32	158
COM 114	4.14	1.15	71	4.08	1.20	727	4.64	0.68	132
ENG 131	4.00	1.03	44	3.53	1.24	609	3.89	1.19	66
HIS 106	3.83	0.83	12	2.83	1.22	144	3.32	1.32	97
MAT 153	3.73	1.32	22	3.16	1.33	372	3.28	1.28	99
POL 103	3.69	1.18	13	2.87	1.31	181	3.36	1.23	127
SOC 161	4.41	1.05	27	3.47	1.39	561	3.86	1.24	116

Note: Grades based on A = 5, B = 4, C = 3, D = 2, F = 1

at least 12 or more students. Table 2 presents descriptive data for Collegiate Connection and university students in the 7 courses where enrollment numbers allowed meaningful comparisons.

Table 3 and Table 4 are also displayed in an effort to show mean grade differences for Collegiate Connection students based on gender and economic background. Due to the low sample sizes, specific internal grade comparisons of Collegiate Connection students were not appropriate based on these descriptive subcategories. This information is offered for information only and in an effort to establish preliminary baseline data for future comparison.

To compare mean grade differences in the 7 selected high enrollment courses among Collegiate Connection students, university freshmen, and university non-freshmen students, an analysis of variance (ANOVA) was used. In addition to these initial comparisons, Sheffe's method was used for post hoc group comparisons. Table 5 displays ANOVA findings and post hoc comparison information.

For the *Introduction to Psychology* course (PSY 120), ANOVA results revealed an initial significant difference among the three groups $F(2,926) = 16.37$, $p < .01$. When post hoc comparisons were explored, grade averages for Collegiate Connection students were significantly greater than those of university freshmen $F(2,926) = 12.6$, $p<.001$

Table 3
Descriptive Statistics (Mean Earned Grades) for Collegiate Connection Students by Gender and Course

	Mean	SD	n
PSY 120			
M	3.89	1.18	43
F	3.49	1.21	86
COM 114			
M	4.17	1.00	24
F	4.13	1.23	47
ENG 131			
M	4.06	1.11	18
F	3.96	0.99	26
HIS 106			
M	4.33	1.15	3
F	3.37	0.71	9
MAT 153			
M	4.0	1.49	10
F	3.5	1.17	12
POL 103			
M	3.75	1.39	8
F	3.75	0.95	13
SOC 161			
M	4.43	0.79	7
F	4.37	1.16	19

Note: Grades based on A = 5, B = 4, C = 3, D = 2, F = 1

and similarly, university non-freshmen grade averages were also significantly greater than those of university freshmen $F(2,926) = 11.7$, $p<.001$.

When *American History* (HIS 106) was explored, ANOVA results again revealed significant mean grade differences among the three groups $F(2,250) = 3.48$, $p<.01$. Post hoc comparisons revealed that mean grades for Collegiate Connection students were significantly greater than university freshmen $F(2,250) = 3.05$, $p<.05$ and that mean grades of university non-freshmen were significantly greater than university freshmen $F(2,250) = 3.00$, $p<.05$.

Analysis of Variance also revealed a significant difference in mean grade averages among the three groups in the *Introduction to Sociology* course (SOC 161) $F(2,701) = 4.82$, $p<.01$. Post hoc comparisons revealed that mean grades for Collegiate Connection students were significantly greater than university freshmen $F(2,701) = 3.17$, $p< .05$. Important to also note was that for *Introduction to Communication* (COM 114) and *Introduction to Political Science* (POLY 103), ANOVA results revealed significant mean grade differences among the three groups $F(2,927) = 4.28$, $p<.05$ and $F(2,318) = 3.67$, $p< .05$ respectively. In each of these post hoc comparisons among individual groups, university non-freshmen mean course grades were significantly greater than university freshmen grades in both courses $F(2,927) = 4.14$, $p<.05$ and $F(2,318) = 2.89$, $p<.05$.

It is also important to note that in Table 1 (collapsed content areas) and Table 2 (7 specific high-enrollment courses) mean grade averages for Collegiate Connection students exceeded university freshmen in every case for individual courses and collapsed content subject areas. In addition, Collegiate Connection student course averages either compared favorably or in some cases were slightly greater than university non-freshmen grade averages in all courses and content areas that were explored.

Table 4
Descriptive Statistics (Mean Earned Grades) for Collegiate Connection Students by SES and Course

	Mean	SD	n
PSY 120			
Low SES	3.00	1.33	28
High SES	3.80	1.11	101
COM 114			
Low SES	3.85	1.46	26
High SES	4.31	0.90	45
ENG 131			
Low SES	3.65	0.99	17
High SES	4.22	1.01	27
HIS 106			
Low SES	3.50	0.71	2
High SES	3.90	0.88	10
MAT 153			
Low SES	3.56	1.42	9
High SES	3.85	1.28	13
POL 103			
Low SES	1.00	—	1
High SES	3.92	0.90	12
SOC 161			
Low SES	4.00	1.67	6
High SES	4.52	0.81	21

Notes: Grades based on A = 5, B = 4, C = 3, D = 2, F = 1. Low SES was defined as participants receiving some form of financial aid or those that were placed on a payment plan. High SES was defined as those participants who paid fees at the time of enrollment.

Discussion

This study assessed the extent to which high school students enrolled in the Collegiate Connection program at Indiana University—Purdue University Fort Wayne (IN) were successful (as measured by course grades) in university level courses. The results of this report suggest that the CC students were, in fact, successful in their university courses and earned grades that surpassed freshman level university students in selected courses.

We are encouraged by the initial results as it appears that the Collegiate Connection Program is effective in assisting high school students experiencing dual or concurrent enrollment. It would appear the program and the participants are showing levels of success that indicate high school students are able to complete university level course work offered through Collegiate Connection. In addition, the collaborative nature of the university and local school corporations in their support of this program appears to be successful.

Table 5
Analysis of Variance (ANOVA) and Post Hoc Comparison Results for Student Achievement for Collegiate Connection Students, University Freshmen and General University Population by Specific Courses

	Source of Variation	Sum of Squares	df	Mean Square	F
Psy 120	Between	48.94	2	24.5	16.37**
	Within	2.99	926	0.003	
	Post Hoc Comparisons	CC > FR, F(2,926)=12.6*** NFR > FR, F(2,926) = 11.7 ***			
Com 114	Between	17.81	2	8.91	4.28*
	Within	4.16	927	0.004	
	Post Hoc Comparisons	NFR > FR, F(2,927) = 4.14*			
Eng W131	Between	7.76	2	3.88	2.16
	Within	3.59	712	0.005	
His 106	Between	10.65	2	5.30	3.48**
	Within	3.06	250	0.01	
	Post Hoc Comparisons	CC > FR, F(2,250) = 3.05* NFR > FR, F(2,250) = 3.00*			
Mat 153	Between	3.68	2	1.84	1.14
	Within	3.21	490	0.006	
Poly 103	Between	11.35	2	5.68	3.67*
	Within	3.09	318	0.009	
	Post Hoc Comparisons	NFR > FR, F(2,318) = 2.89*			
Soc 161	Between	17.21	2	8.61	4.82**
	Within	3.57	701	0.005	
	Post Hoc Comparisons	CC > FR, F(2, 701) = 3.17*			

Note: * < .05, ** < .01, ***< .001. The Scheffe' test was used for all post hoc comparisons
CC = Collegiate Connection Students
FR = University Freshmen
NF = Non-Freshmen

As with many experimental educational programs, a point of caution should be noted. To a great extent, this select group of CC students was comprised of motivated and talented students. It is certainly the case that one might expect positive results based on those two characteristics alone. Academic talent and motivation are characteristics that would seem to predict a high level of success in any academic program. However, dismissing the results on that basis would be an error as the CC program includes students with low SATs, low class percentile ranks, and low GPAs, who also successfully completed university courses. It is of particular interest that the CC students received grades in IPFW courses that statistically exceeded those of the university freshmen, their close-in-age contemporaries. Clearly, the CC students were successful in navigating a university system of courses and expectations at a similar level to most students enrolled at IPFW.

The typical IPFW student is a commuter, living off campus, and employed in at least one job. They take their course work seriously, but usually have work and family obligations to juggle with their university load. Collegiate Connection students often work, but the primary focus of these students is on their education. It is highly conceivable that CC students will have fewer distractions and obligations to manage. This may result in an increased ability to study and to earn higher grades when compared to IPFW students. While there may be a temptation to discount the comparison of grades based on this characteristic, many CC students also work, participate in extra-curricular activities, and are younger in age and less experienced than typical IPFW students. At this time, the analysis of these additional factors has not been completed. We continue to explore the impact of these additional variables.

An additional caveat should be expressed in regard to the number of CC students in this study as compared to the IPFW groups. The current sample of over 400 CC students is approaching a size that will give future researchers more confidence in interpreting their results. At this time, it can be said that there is guarded optimism that findings will become more generalizable as the CC sample grows with each new

semester. There are emerging data that support this optimism for both the effectiveness of the program and the role that the CC administrative structures play in student success.

At present, of particular interest is the consistency of the data focusing on student GPA by group. In classes chosen for analysis, the CC students significantly surpassed the grades of freshman IPFW students in five of seven courses. Equally consistent are the data suggesting that CC students earn grades that are statistically equal to the IPFW student sample comprised of all students. If these findings were arrived at for a course or two, it would be far less meaningful. Replicating findings with consistent results and patterns of achievement for five of seven comparisons offers additional support for this program.

At this point in the study, investigators are encouraged to see data seemingly supporting the dual enrollment effort at IPFW. With the program now in its fourth year and findings indicating student success when measured by course GPA's, the Collegiate Connection program seems to be having a positive impact on its students. The increased number of students taking higher level courses will also provide information about student success in more complex courses. Further data gathering, including student surveys and evaluation data is anticipated as it will bring ancillary information to the analysis and provide a better context for analysis.

Until that time, the current data provide a sense of guarded support as to CC effectiveness when representing program viability to parents, educators, and potential students. With this effectiveness comes an additional programming option for students referred to the program. These expanded program options are needed for students who have exhausted the high school curricula. To have the chance to enroll in courses commensurate with their knowledge and ability is a promising opportunity. Being able to earn substantial college credits at the same time is an added bonus.

Conclusion

It is not atypical to find talented high school students who can easily complete selected university classes at a young age. Dual enrollment literature discussed earlier examined a variety of programs. Many universities and colleges permit motivated students to enroll in one or two classes while completing high school. These programs provide students with an opportunity to select both high school and college-level courses that satisfy a student's individualized needs. With enrollment in such programs comes the opportunity to shorten the time spent in traditional secondary schooling and the possibility of completing post-secondary education more quickly. Not only is this a savings to families in an economic sense, but, it also puts these talented students on a career path to bring their skills to the world earlier.

The research that explores these types of dual enrollment programs seems to indicate that there may be viable programming options for high ability students in collaborations between local institutes of higher learning and area high schools. Data reported on the Collegiate Connection program appears to show that CC high school students meet and often exceed their classmates in final course grades. If grades are a measure of success, IPFW's Collegiate Connection appears to be successful. We are pleased with these initial results as they suggest that similar types of programs can effectively support high school students' early entry into the college arena.

Further analysis and study of the Collegiate Connection program promises to bring clarity to some interesting questions currently hanging in the balance. Will attendance in the CC program effect the number of program students that select IPFW as their college choice? Do the CC students change their occupational plans after completing the CC program? What impact does high school employment have on program success? What impact does gender have on program success? How do economic status and GPA interact? Are scores on the SAT or percentile rank in high school strong predictors of CC program success? These and other questions need further investigation.

References

American Association of Community Junior Colleges Small/ Rural Community Colleges Commission: Exemplary Programs and Services (1991). Washington, D.C. (Eric Document Reproduction Service No. ED 341 441).

Boothe, D, Sethna, B. N., Stanley, J. C., and Colgate, S. O. (1999, Summer). Special opportunities for exceptionally able high school students: A description of eight residential early-college-entrance programs. *Journal of Secondary Gifted Education, 10*(4), 195-203.

Chiang, S. (September 21, 1998). Pulling off an end run around prop 209. *Community College Week, 11*(4), 19.

Clayton, M. (1999, February). After-school activity? Try college. *Christian Science Monitor, 91*(46), 15.

Cullen, C., and Moed, M. G. (1988, Fall). Serving high-risk adolescents. *New Directions for Community Colleges, 16*(3), 37-49.

Crossland, R. (1991, October). *The Running Start program: Impact and benefits from the first year in Washington Community Colleges* (Operations report 91-4). Olympia, WA. State Board for Community and Technical Colleges. (ERIC Document Reproduction Service No. ED 338 288).

Crossland, R. (1994, December). *Running Start: 1994-95 annual progress report.* Olympia, WA. State Board for Community and Technical Colleges. (ERIC Document Reproduction Service No. ED 388 370).

Crossland, R. (1996, January). *Running Start: A progress report from the State Board for Community and Technical Colleges.* Olympia, WA. State Board for Community and Technical Colleges. (ERIC Document Reproduction Service No. ED 390 486).

Evelyn, J. (February 9, 1998). Dual-enrollment graduate honored at White House. *Community College Week, 10*(14), 17.

Galloway, J. (1994, April). Dual enrollment gets students where they want to go–only faster. *Vocational Education Journal, 69*(4), 13.

Greenberg, A. R. (1988, Fall). High school students in college courses: Three programs. *New Directions for Community Colleges, 16*(3), 69-84.

Greenberg, A. R. (1991). Concurrent enrollment models. In *High School-College Partnerships: Conceptual Models, Programs, and Issues* (pp 25-47). ASHE-ERIC Higher Education Report No. 5. Washington, D.C.: The George Washington University, School of Education and Human Development.

Henry, T. C. (December 29, 1997). While focusing on career preparation. *Community College Week, 10*(11), 4-5.

Katz, D., and Fisher, R. (1991). *Occupational education bridge program in community colleges for academic high school students.* New York. City University of New York, Institute for Research and Development in Occupational Education. (ERIC Document Reproduction Service No. ED 345 097).

Koelling. R. (December 29, 1997). Dual enrollment blurs the lines. *Community College Week, 10*(11), 4-5.

Lieb, D. A. (August 23, 1999). Arkansas places restrictions on dual-enrollment programs. *Community College Week, 12*(1), 117.

McCarthy, C. R. (1999, Fall). Dual-enrollment programs: Legislation helps high school students enroll in college courses. *Journal of Secondary Gifted Education, 11*(1), 24-32.

Olszewski-Kubilius, P. (1995, December). A summary of research regarding early entrance to college. *Roeper Review, 18*(2), 121-126.

Puyear, D. (1998). *Concurrent and dual enrollment of high school students in Arizona community colleges: A status report.* Arizona State Board of Directors for Community Colleges: Phoenix.

Reiss, P. L., and Follo, E. J. (1993). *Accelerated education methods for intellectually gifted secondary students.* (ERIC Document Reproduction Service No. ED 359 708)

Sayler, M. F. (1992, April). *Early college entrance for gifted high school students: Experiences and guidelines.* Paper presented at the Annual Meeting of the Council for Exceptional Children, Baltimore, MD. (ERIC Document Reproduction Service No. ED 345 395).

Schumacker, R. E., and Sayler, M. (December, 1995). Identifying at-risk students in an early college entrance program. *Roeper Review, 18*(2), 126-130.

Schwalm, D. E. (1991, Fall-Winter). High school/college dual enrollment. *WPA: Writing Program Administration, 15*(1-2), 51-54.

Smith, S. (August 23,1999). Utah questions dual enrollment. *Community College Week, 12*(1), 3-4.

Vivion, M. J. (1991, Fall-Winter). High school/college dual enrollment and the composition program. *WPA: Writing Program Administration, 15*(1-2), 55-60.

Windham, P. (1997). *High school and community college dual enrollment: Issues of rigor and transferability*. Tallahassee, FL. (Eric Document Reproduction Service No. ED 413 936).

Learning from Experts: Relational Stories and the Textual Assimilation Interchange

Terri Teal Bucci
Ohio State University–Mansfield

Introduction

Guided instruction, Vygotskian theory, and assimilation are often issues discussed in preservice education courses. This paper suggests that this discussion extend to textual representation of expert experiences through stories: give novice teachers a view of the classrooms of expert teachers. This paper suggests that by looking at the classroom experiences of experts via stories, a novice or struggling teacher could take from that reading knowledge that may assist in the teaching and learning of their own classroom. Additionally, the model presented in this paper, the textual assimilation interchange, suggests that multiple readings of the same story could lead to further development by connecting to new experiences.

Throughout this writing, I use the terms reader, writer, and experts. The reader in the context of this writing is anyone who reads the stories of experts. Most commonly, this will be a preservice or inservice teacher who is interested in learning about the actions of experts or those who know (experts). The writer, most likely, is a researcher but could also be a practitioner or other resource for writing the stories of experts. The experts are those who have been found such through appropriate research methods for a given study.

Looking to experts

> If you want to understand what a science is you should look in the first instance not at its theories or its findings, and certainly not what its apologists say about it; you should look at what the practitioners of it do. *Clifford Geertz (as stated by VanMaanen, 1988)*

Often times teacher educators look to those in the profession who portray what is determined to be expertness in the field as a guide on how to teach (Ladson-Billings, 1994; Paley, 1979; Whitaker, 1999). We look to studies of experts to give ideas or suggestions to preservice teachers who are searching for ways to improve their teaching or to give them tips. Why is this common practice? Do we believe that expert teachers can transfer their knowledge and experience to others? In short, how can the study of experts help the novice or struggling teacher?

Simon and Chase (1973) conducted a study of expert chess players. In this study, they found that master chess players could look at a midgame chessboard for a brief time, seconds, and reconstruct the positioning of the pieces on an empty board. The novice players had some difficulty doing the same. Oddly, though, when **randomly** placed chess pieces were about the board, not in an actual game, the master players and the novice players had no difference in the skill of remembering where the pieces were placed. What does this say? Leinhardt and Putnam (1988) deduce that this study indicates that, "The expert appeared to have built up a system of knowledge that allowed him to recognize familiar patterns…(P. 7)." What else does this say? The fact that experts were no longer at an advantage with a synthetic game could translate to teaching by stating that teachers would not be prone to better practice by exposure to synthetic text concerned with teaching.

Taking this further, Anderson (1990) states that the experiences of experts force a type of mechanical response to similar events. Because of this, many experts cannot articulate the processes or pedagogies that others see as making them experts (Ethell and McMenian, 2000). Again, how does this relate to teacher education? How can future or current teachers, benefit from experts if experts cannot communicate their expertness and that expertness comes from experiences?

The answer lies with the stories of experts. By providing stories of experts, I will call them relational stories; teacher educators and researchers can provide novice or struggling teachers with a knowledge base on which to create a foundation of familiarity with common occurrences in the classroom. The purpose of this work is to present a cyclical representation of the learning through the stories of experts. By providing preservice and inservice teachers with stories written in journals, texts, and books, teacher educators and researchers can guide them to a deeper, authentic understanding of teaching, learning, and the complexities of education.

Expert stories and the connection to theories of learning

The rationale for expert stories come from the basic tenets of Vygotskian theory; the assumption that individual learning is dependent on social interaction (van Oers, 1996). More specifically within the context of relational stories, the inclusion of an expert (higher knower) will influence the reader's (learner's) meaning of the text and, thus, of pedagogical practices. The influence of this expert will allow the reader to achieve a meaning of teaching and pedagogy that will guide him/her to a higher level of knowing (pedagogical practice).

This is typical of Vygotsky's idea of Zone of Proximal Development (ZPD). One interpretation of Vygotsky's work gives the following definition of the ZPD:

> It (ZPD) is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. *(Vygotsky, 1934, translated in 1978, p. 86)*.

This definition leads to the support of the study of expert experiences and the stories of their classrooms as a motivator for a potentially higher development for the reader or novice teacher. The expert is the adult guidance or more capable peer. The stories are the vehicle of the expert's guidance. The writer/researcher is the messenger.

Vygotsky's ZPD and through it the figure of the more capable peer, is very similar to the idea of apprenticeship. Apprenticeship and the relation of the apprentice with the expert are the initial intention of the work of Lave and Wenger in their book, *Situated Learning: legitimate peripheral participation*, (1991). In this text, they write of a derivative of situated learning, legitimate peripheral participation. Where situated learning is based on theoretical perspectives, negotiated meaning, and dilemma-driven concern, legitimate peripheral participation is, "…a way to speak about the relations between newcomers and old-timers (p. 29)." Now, I am certain that most experts in educational studies would debate the use of the term, old-timer. However, the connection is clear.

Lave and Wenger (1991) go on to stipulate that legitimate peripheral participation differs from apprenticeship in that it is not simply learning by doing. They write that learning is a social practice. The process of legitimate peripheral participation is one in which the newcomer is enculturated into the community of professionals: meaning that the newcomer is not simply repeating the actions of a higher knower, or old-timer. The newcomer is growing to know the social and cultural atmosphere of the situation and using this knowledge to better react and act in certain situations. This leads to the support of the study of expert stories throughout the preservice and inservice teacher education programs and suggests that not only should stories be read, but they should be discussed to encourage the growth of this social and cultural atmosphere.

The theory of social interactionism (Voigt, 1996) and symbolic formation (van Oers, 1996) provides a basis for the premise that individual readers of particular stories will interpret them in varying ways. Because different teachers have individual constructions of meaning, they will interpret problem situations differently and thus the course of interaction will vary (LeCompte and Preissle, 1993), leading to a variety of solutions to be examined in the analysis of data. Further, subsequent readings of the same story following new classroom experiences either by field experiences (preservice) or classroom experiences (inservice) will yield different reactions and connect with a wider variety of experiences of teaching because these new experiences may have an effect on interpretations of the stories read. Therefore, it is possibly to have a cycle of reading a story of an expert and connecting with the readers past experiences. After the reader teacher spends time in the classroom, they will have a different foundation of experiences with which to connect. Additional readings of the same story at this point then, could connect to these new experiences and thus provide new enlightenment about teaching. By continually adding to the experiences in the classroom, both real (field or classroom) and read (reading the stories of the experts), the list of possible solutions to problems in the classroom grow and allow movement from situation to solution to be more fluid.

Finally, Blumer (1969), one of the pioneers of the social interactionism writes that symbolic interaction is the interplay of individually created symbols with experiences and events and it rests on three basic premises.

1. Human beings act on things based on the meanings that the things have for them.

2. The meaning of such things is derived from social interaction with others.

3. Meanings are adjusted and modified through interpretation of the individual.

The study of expert relational stories relates to the three premises of the symbolic interactionist theory as follows:

1. Readers will react to the stories of the experts in a variety of ways. The experiences of the experts will come from a variety of experiences that have, in them, different symbolic meanings.

2. Social interaction could be constructed through the conversational manner of experiences of the experts.

3. Reader meanings can be adjusted and revisited through the varying stories of each expert to each problem situation and each world view application. Experiences of the novice teacher would then be incorporated into the experiences of the experts.

Cyclic representation of learning through expert stories

Educational psychologists maintain that experts' procedural knowledge remains unarticulated, methodological, and experiential (Ethell and McMeniman, 2000). However, by studying experts and writing their collective relational stories, the reader would undergo what I call a pseudo-experience of the experts. This is an experience through text rather than physical being. It is not necessary for the reader, preservice or inservice teachers, to actually experience the events of a classroom to benefit from the happenings. Researchers/writers can place readers (preservice and inservice teachers) in the classrooms of experts. The intent is not to bond the reader with expert knowledge, but rather with the experiences of the expert that can connect to previous experiences of the reader or become newly constructed, owned by the reader. The intent is to create an *assimilation para-*

digm (Davis, 1996) through the experiences of the experts. Davis describes an assimilation paradigm as follows:

> When some form of data that requires processing confronts any of us, our first attempt is to see if it can be made to match something that we already know. If so, the 'something that we already know' is an assimilation paradigm (p. 8).

In the study of expert teachers, the assimilation paradigms grow through the stories of the experiences of the experts. By using a variety of types of stories and various views of the experts, you would give breadth to the assimilation process, because each reader comes to the reading with varying experiences of teaching and learning.

In the proposed, cyclical model of learning through expert stories, the textual assimilation interchange, the enculturation of the newcomer (novice/struggling teacher) is through the relational stories. The text, which could be in any number of formats; realist, confessional, or impressionist tales (VanMaanen, 1988), bring the reader into the expert's world and give them an experience that they can take and connect to both previous and future experiences. It is the stories, then that are the mechanism of the knowing of the social and cultural atmosphere of the classroom.

Investigating experts to find solutions, pure and unabridged is problematic. There are varieties of "solutions" to certain problem situations that arise in the classroom. Each solution will/could yield varying symbols and symbol modifications for the reader. Not only will the experiences of the reader, thus their symbol identification with events, be of paramount importance, but the experiences of the experts and the researcher also come into play in the development of meaning. In addition, the immediate experiences of the writer/researcher and the reader will have an effect on the meaning development and, thus, on the symbol modification. Not only do past experiences and cultures of the classroom affect learning, but also the **immediate** culture and experiences of a teacher may alter the ability to learn at one's highest potential. A spontaneous action or crisis in a teacher's classroom immediately before reading relational stories may alter the potential of obtaining new knowledge.

I have demonstrated the effects of experience and spontaneous events in Figure 1. The reader, the experts, and the writer/researcher all have a great deal to do with the meaning obtained by the use of relational stories and thus the symbols created by the reader. This model of learning from expert stories is the textual assimilation interchange. This means of learning from experts not only incorporates the ideals of symbolic interaction, but it includes the process of assimilation and the influence of the symbolic interaction of others on an individual's symbolism.

By reading relational stories of experts, the outcome for readers has a multitude of possibilities. The reader's past experiences does not only determine this outcome, but also just as importantly by the researcher and expert experiences. A writer's biases or prior experiences influences how the story is written. In addition, expert experiences influence what the researchers sees n the classroom or hears in an interview. Additionally, the experiences of those involved in the dissemination of the relational stories can vary with immediate happenings. For example, if the expert has had an unusual experience (many absences, a fight in the hall, etc.) on the scheduled day of an observation, the researcher will see something different than if the expert teaches a typical day. These occurrences change the relational stories. The same effect could happen if the researcher/writer has immediate experiences that alter the manner of collection of

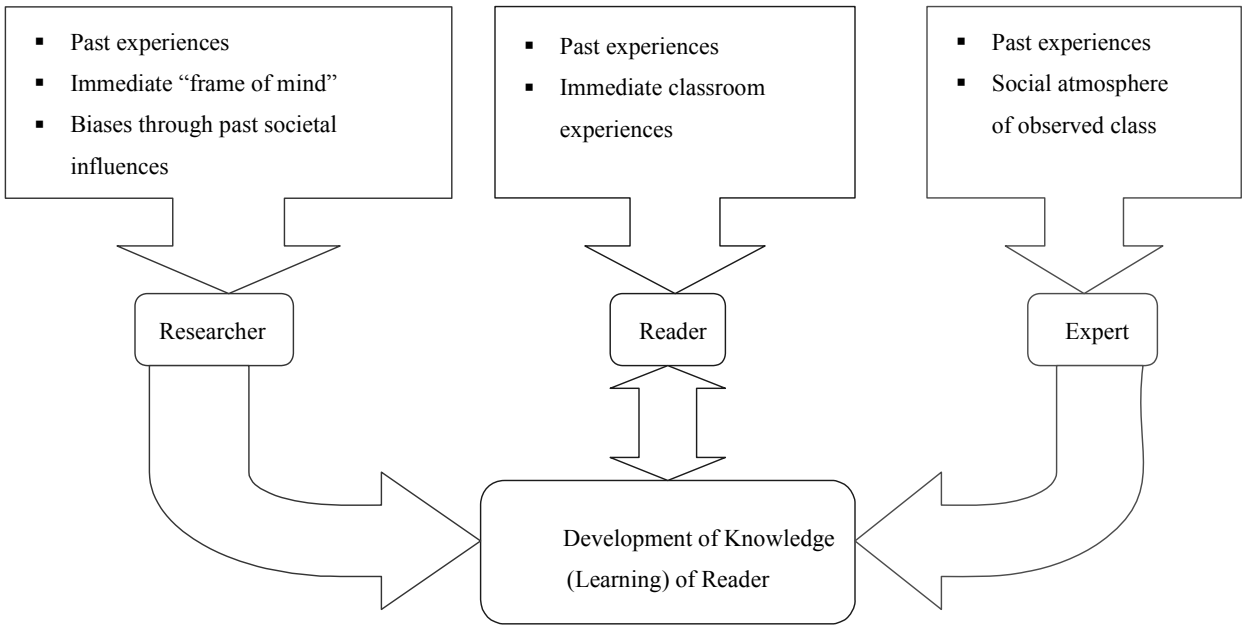

Figure 1. Textual assimilation interchange.

data or the writing of the story. My point is that the relational stories and the outcome of reading these stories are multifaceted within the frame of experiential learning.

How does textual assimilation interchange, referring to the learning from expert relational stories, guide the reader to creating assimilation paradigms and symbols that can be drawn upon while in the classroom?

Examples of Relational Stories

What follows is an example of a relational story. This story is of an expert mathematics teacher. She was selected through emergent measure (Bucci, 1999) from the mathematics teachers, counselors, and administrators in her urban high school. The text is designed to place the reader in the room with the expert. The story represents an impressionist tale, one that uses the words of the story and infuses imagery and expansive recall of the events/observation (VanMaanen, 1988). Read on, and meet Dee (a pseudonym) through this relational story. The writer is the researcher.

> I went to Dee's office, which she shares with all of the other math teachers and found her at a counter in the corner talking to a female student about fractions. The girl seemed to be having trouble with a particular problem and Dee was facing her and giving the girl her undivided attention. She briefly looked up to see me at the other side of the room and continued working with the girl. I busied myself with some papers and waited, patiently for the opportunity to talk with this interesting and remarkably different teacher.
>
> Had it not been for the fact that Dee was about 6'2" with an unusually confident air in both manner and speech, I may have mistaken her for a student. Her terminology, dress (a Tommy Hilfinger shirt), and casual stance portrayed a belonging with the students in this school. I continued to wait until the bell rang to change classes. Only after the girl stood up to go to her next class did Dee come over and put out her hand. I shook the strong and firm grip of a confident and athletic woman who has managed to mesmerize not only her students and their parents but also me, in this short time. Dee directed me to the library where I thought I would conduct an interview.
>
> Little did I know that Dee would be in the driver's seat of this task. If you were to look at the interview transcripts, you would see little occasion when I spoke. I rarely had to ask a question. Dee went into a story about everything; not the kind of story that you anxiously wait to end, but the type that keeps you at the edge of your seat. She was quite captivating with her stories of education and her sincere goal of emancipation for her students.

After asking her to describe her teaching philosophy she, without hesitation told me that her basis of teaching is all about self-esteem. Her exact words were, "Self esteem is the bottom line. Anything I do in my classroom is how will it effect the self esteem of my students." Dee's response seemed to have nothing to do with math. It was, from that point on, a conversation about students, not teachers, and had little to do with mathematics.

She talked of her personal struggle with the concepts in mathematics and the fact that that struggle causes her to look differently at the subject and her students than would a teacher whom had no struggle at all. Dee talked, at length, about her conversations with the parents of her students. She calls them all, every two weeks. Yes, every ten school days!

Dee's methodology is simple. She gives no homework. It made me cringe at first, but listen to the rest of Dee's story. She gives no homework because she says, "I'm gonna work you (them) hard enough when you're sitting in my class that you don't have to take it home." You may be thinking, "Well, what about the study habits and the working to get want you need?' I thought these things too, until I saw what happens in Dee's class.

So, how does Dee teach math? Does she use algorithms, discovery methods, or cooperative learning groups? Well, she uses a bit of each of these methods but I would call her most prevalent method of delivery, stories. Dee told me of the story she was working on at the time. She was teaching her students how to solve equations and what follows are her words from our interview. The story goes like this.

"When you're solving an equation, the letter is a hoochie mamma, and people are trying to break up with her and she has all these people around her. You know (she'll say to the guys), as soon as you find out that your babe is dating somebody else what do you do? (The students respond by saying) Break up. Yeah, you break up. Okay, how do you break up? (The students respond by saying), I do what she doesn't like me to do. Exactly. So then, a positive 8 to break him up becomes a negative 8. Right, so let's shove him over there because we want to get as far away from hoochie as we can (and they laugh)."

Dee continued with her story to me by saying:

"But, they are all on it then. They are all paying attention. And in class I can say, who's the hoochie? And they'll say, c. The other day, actually, they got a big kick because the letter was the letter u, and I didn't realize that and I said who's the hoochie, and they said, U. And I was like, hold

on, and everybody started laughing. And the mom actually came that night to conferences and I said your child called me a hoochie today. And we were laughing."

Dee's story gives the reader an experience in her classroom. It also gives the reader a piece of the writer/researcher that they might find valuable in interpreting the story and connecting it to their own professional life. The experiences provided by reading this story would be one of the conversations with an expert. It could provide the reader with a picture of how one expert sees students, how one expert values student's time, and how one expert relates material to students. All of this pseudo-experience, gained from the reading of the story, could connect to a readers past experiences either as a student or a teacher and provide an assimilation paradigm for growth as an educator.

By reading the story again, perhaps after having had the opportunity to apply some of experience gained through the first reading, a teacher may have further connections to the reading and new applications. This cycle could foster continued growth and connection between expert, researcher, and reader: each time, the reader bringing in new experiences.

Implications for Teacher Education

In connection to relational stories of expert teachers, the experts are most assuredly the transport for the concern-driven learning of the reader. The varying stories they tell and the options of solutions provided would guide the reader to find a connecting symbol(s). Once formed, these symbols can grow and fuse with the reader's new experiences and future stories of experts.

Reading about the stories of experts is a beginning. A beginning built of experiences, known and told, but experiences that form into meaningful learning and growth as educators. One goal of expert stories is to build on those experiences with authentic experiences of the person reading the text: to create a textual assimilation interchange that leads the reader to educational awareness that will ultimately improve their teaching. Another goal, from a teacher educator's perspective, is to build on the textual experience with conversation in class: discussion to build on the story and find connections to the readers or a group of readers of one story. The implication for teacher education of the use of stories as experience-building tools in the teacher education classroom is vast. Stories can bring new experiences to individuals who do not have either the opportunity or ability to visit as many classrooms as possible. In addition, it brings to the reader the opportunity to "visit" the class of an expert teacher.

References

Anderson, J. R. (1990). *Cognitive psychology and its implications*. (3rd ed.). New York: Freeman.

Blumer, H. (1969). *Symbolic interactionism: Perspectives and method*. Englewood, NY: Prentice Hall.

Bucci, T. T. (1999). *Expert mathematics teachers' parallels to worldviews: Investigating pedagogical responses to novice mathematics teachers' concerns*. Unpublished doctoral dissertation, The Ohio State University, Columbus.

Davis, R. B. (1996). Classrooms and cognition. *Boston University Journal of Education, 178*(1), 3-11.

Ethell, G. and McMeniman, M. (2000). Unlocking the knowledge in action of an expert practitioner. *Journal of Teacher Education*, *51*(2), 87-99.

Ladson-Billings, G. (1994). *The dreamkeepers*. San Francisco: Jossey-Bass Inc. Publishers.

Lave, J. and Wagner, E. (1991). *Situated learning: legitimate peripheral participation*. Cambridge [England]; New York: Cambridge University Press.

LeCompte, M. and Preissle, J. (1993). *Ethnography and qualitative design in educational research*. San Diago: Academic Press, Inc.

Leinhardt, G. and Putnam, R. (1988). Profile of expertise in elementary school mathematics teaching. In *Preparing Elementary School Mathematics Teachers*, J. Worth, (Ed.). Reston, VA: The National Council of Teachers of Mathematics, Inc.

Paley, V. (1979). *White teacher*. Cambridge, Massachusetts: Harvard University Press.

Simon, H. and Chase, W. (1973). Skill in Chess. *American Scientist*, *61*, 394-403.

VanMaanen, J. (1988). *Tales of the field*. Chicago: The University of Chicago Press.

van Oers, B. (1996). Learning mathematics as participation in classroom practice: Implications of sociocultural theory for educational reform. In *Theories of Mathematical Learning*, L. Steffe, P. Nesher, P. Cobb, G. Goldin, and B. Greer (Eds.). Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers, 91-115.

Voigt, J. (1996). Negotiation of mathematical meaning in classroom processes: social interaction and learning mathematics. In *Theories of Mathematical Learning*, L. Steffe, P. Nesher, P. Cobb, G. Goldin, and B. Greer (Eds.). Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers, 21-50.

Vygotsky, L. S. (1978). *Mind and society*. M. Cole, V. John-Steiner, S. Scribner, and E. Souberman, Eds. Cambridge, MA: Harvard University Press. (Originally written in 1934).

Whitaker, T. (1999). Utilizing 'superstar' teachers to lead change. *Catalyst for Change*, *29*(1), 5-8.

The Mid-Western Educational Research Association
Gift Membership

A gift membership has been given to you, _____

by _____

Your name is now included as a member in one of the most recognized, well respected, educational research groups in the United States and Canada. Your **one year membership** includes a subscription to the ***Mid-Western Educational Researcher***, the Association's journal that highlights research articles, features, interviews, and Association news. Members pay reduced registration fees for the annual meeting held in Chicago in October. This conference attracts many nationally recognized leaders in educational research. Enjoy your membership.

Thank you for providing your colleague, student, or friend with a special one year gift membership to the Mid-Western Educational Research Association. It is a gift of professional involvement that is sure to be appreciated throughout the year. To give your gift membership fill out the top portion of this card and use it to inform the recipient of the gift membership; then fill out the bottom portion of this card and mail it with your check to: **Jean W. Pierce - Dept EDCSE - Northern Illinois Univ. - DeKalb, IL 60115**

	Person Receiving Gift Membership	**Person Giving Gift Membership**
Name	_____	_____
Address	_____	_____
	_____	_____
	_____	_____
Affiliation	_____	_____
Work Phone	_____	_____
Home Phone	_____	_____
E-mail	_____	_____
Fax	_____	_____
Division	_____	_____

Preference (optional)

Check one below and make check payable to Mid-Western Educational Research Association.

☐ **Professional Membership - $25**

☐ **Student Membership - $15**
Student must be currently enrolled.

The Ohio State University
2500 Kenny Road
Columbus, Ohio 43210