

Copyright is retained by the first or sole author, who grants right of first publication to the **EDUCATION POLICY ANALYSIS ARCHIVES**. EPAA is a project of the [Education Policy Studies Laboratory](#).

Articles appearing in EPAA are abstracted in the *Current Index to Journals in Education* by the [ERIC Clearinghouse on Assessment and Evaluation](#) and are permanently archived in *Resources in Education*.

Volume 11 Number 18

June 12, 2003

ISSN 1068-2341

---

## An Examination of the Longitudinal Effect of the Washington Assessment of Student Learning (WASL) on Student Achievement

Donald C. Orlich  
Washington State University

Citation: Orlich, Donald C. (2003, June 12). An examination of the longitudinal effect of the Washington Assessment of Student Learning (WASL) on student achievement. *Education Policy Analysis Archives*, 11(18). Retrieved [date] from <http://epaa.asu.edu/epaa/v11n18/>.

### Abstract

Linn, Baker and Betebenner (2002) suggested using the effect size statistic as a measure of adequate yearly progress target (AYPT) as is required by PL 107-110. This paper analyzes a four-year data set from the required high-stakes test--Washington Assessment of Student Learning—using effect size as the AYPT metric. Mean scale scores for 4th, 7th and 10th grade reading and mathematics were examined. Nominal descriptors suggested by Cohen (1988) were applied and showed no yearly effect in student achievement as a function of the WASL. Comparing the 1998 scale scores to those of 2001 showed a small effect. However, manipulating the effect size criterion from 0.20 to 0.05 did show small yearly effects in student achievement. Meeting AYPT objectives will be a problem of defining the standard as yearly score fluctuations occur. The educational research community should challenge the statistical logic associated with setting AYPT's.

A statistical and accountability dilemma has emerged due to the passage of the “No Child Left Behind Act of 2001” (PL 107-110). States are now forced by federal law to show adequate student yearly progress targets, which will be met through

high-stakes testing. Several states have constructed their own accountability systems that feature criterion-referenced assessments. However, student test scores tend to display characteristics of norm-referenced tests, i. e., normal distributions. The use of effect size statistics, which is herein applied to one state, has been suggested as one means of determining the required adequate yearly progress targets (Linn, Baker & Betebenner, 2002).

### **The Washington State Model (WASL)**

The State of Washington established the Washington Assessment of Student Learning (WASL) as its accountability tool. The WASL is keyed to the state's standards called "Essential Academic Learning Requirements." The WASL is used to test all 4th, 7th and 10th graders in mathematics, reading, and writing. The 5th, 8th and 10th graders will be assessed in science. Listening is also assessed. Using the data collected from the 1998 through 2001 WASL administrations; the writer calculated effect sizes (see Cohen, 1988) to observe trends.

The purpose of this study is to determine the effect on student achievement as a consequence of the longitudinal administration of the Washington Assessment of Student Learning (WASL) the state mandated high-stakes test. The WASL scale score means and standard deviations were available for the years 1998, 1999, 2000 and 2001 for mathematics and reading and are shown in Table 1. The average number of students taking the WASL math and reading tests during the four year period for grades 4, 7 and 10, respectively, are 70,431; 72,864 and 66,856. These three combined totals account for 21 percent of the state's total 2001-02 K-12 student population of 1,010,424 (Education Profile, 2002). The number of WASL test-takers is significant.

**Table 1**  
**Yearly Means and Standard Deviations for 4th, 7th, and 10th Grade**  
**Mathematics and Reading Scale Scores On the Washington**  
**Assessment of Student Learning (1998-2001)**

<b>Grade Level and Subject</b>	<b>Spring 1998 Means</b>	<b>Spring 1998 Standard Deviations</b>	<b>Spring 1999 Means</b>	<b>Spring 1999 Standard Deviations</b>
4 - Mathematics	383.5	32.2	386.5	33.9
4 - Reading	402.1	19.3	404.2	19.5
7 - Math	357.4	46.4	364.7	52.0
7 - Reading	390.1	20.1	393.1	20.2
10 - Math	N/R	N/R	382.2	42.8
10 - Reading	N/R	N/R	402.8	29.5
<b>Grade Level and Subject</b>	<b>Spring 2000 Means</b>	<b>Spring 2000 Standard</b>	<b>Spring 2001 Means</b>	<b>Spring 2001 Standard</b>

		Deviations		Deviations
4 - Mathematics	391.2	34.9	393.3	34.9
4 - Reading	407.3	19.6	405.7	18.6
7 - Math	369.1	53.6	368.7	51.6
7 - Reading	393.8	20.9	394.5	20.6
10 - Math	387.6	40.0	390.8	41.1
10 - Reading	407.3	30.2	410.0	30.5

All means and standard deviations are from files of Office of State Superintendent of Public Instruction, Olympia, Washington.

An inspection of the scale score means shows a rather small incremental increase in most means. However, there is a scale point decline of 0.4 in the mean of grade 7, 2001 math scores compared to 2000. A similar decline is noted in 2001 for grade 4 reading, where the mean scale score dropped by 1.6 points compared to 2000.

These patterns have been praised by state policy makers as showing evidence of student progress. However, are the scores truly reflective of student achievement? To answer that question, I use the statistical test of *effect size*.

## Effect size

The *effect size* is a method by which to judge the relative learning worth from independent samples (see Bloom, 1984; Cohen, 1988; Glass, 1980; Marzano et al., 2001; & Walberg, 1999). In this case, what evidence is there that administering and teaching to the WASL has a positive impact on student achievement?

Cohen (1988) defined an effect size as the difference between two means divided by the standard deviation of either group. With independent samples, such as the WASL, one can determine the effect sizes by comparing the means of two different years. Cohen also suggested that the relative efficacy of an effect could be stated in nominal terms. If an effect size (ES) were at least a 0.2, it was labeled as *small*. An ES of at least 0.5 was labeled as *medium*; while an ES of 0.8 or greater was *large*. Thus, an effect size of 0.2 is required to show efficacy of learning. Table 2 shows the effect size calculations and nominal descriptors for this study. In all calculations a uniform method was used. The earlier year is the control, while the latter year of the pair is the experimental group. Standard deviations are from the control years.

**Table 2**  
**Effect Size Calculations for 4th, 7th, and 10th Grade Mathematics**  
**and Reading Scores**  
**On the Washington Assessment of Student Learning (1998-2001)**

Grade Level And Subject	1999/1998 Effect Size	Effect	2000/1999 Effect Size	Effect	2001/2000 Effect Size	Effect
4 - Math	0.09	None	0.14	None	0.06	None
4 - Reading	0.11	None	0.16	None	-0.08	Negative
7 - Math	0.16	None	0.08	None	-0.01	Negative
7 - Reading	0.15	None	0.03	None	0.05	None
10 - Math	N/R	N/R	0.13	None	0.08	None
10 - Reading	N/R	N/R	0.15	None	0.09	None

The effect is described in nominal terms as per Jacob Cohen's (1988) definitions.

## Discussion of Data Sets

Table 2 shows the effect sizes for the 4th, 7th and 10th grade mathematics and reading scores yearly from 1998 to 2001. Examining Table 2, you may note that at the 4th grade level, five scores show *no effect* in achievement, while there is *one negative learning effect* on grade 4 reading in 2001, that is, a decline in achievement.

The grade 7 pattern is similar showing *no effect* on five of the six scores and one *negative effect* in mathematics for 2001. The grade 10 results show *no effect* on mathematics and reading scores in all cases.

If one were to use an effect size of 0.05, which would account for a two percentile gain, as the Adequate Yearly Progress Target (AYPT), suggested by Linn, Baker, and Betebenner (2002), then 13 of the 16 scores would meet that target. However, using Cohen's (1988) definitions the 16 scores would show no effect and not meet the target. Setting the criterion measure of an adequate yearly progress target (AYPT) may become a major problem of definition. This situation may further complicate the implementation of AYPT policy. It appears that further analysis of setting AYPT's and field-studies are essential.

The average percentile gain during the four-year period of this study (1998-2001) for grades 4, 7 and 10 in math and reading was 3.3. That number would correspond to an effect size of 0.08. That effect size would exceed the AYPT suggested by Linn et al. (2002), but not the nominal ES suggested by Cohen. These differences will be explored further.

Now examine Tables 3 and 4, which display the data and effect sizes by comparing the 1998 WASL scores for grades 4 and 7 to those of 2001; and grade 10 for 1999 and 2001. Using Cohen's classifications, five of the six comparisons show a small effect and only one with no effect. It appears to take several years to show any effect. Using WASL math results released in the SRI International report (2002) showed that for grade 4 from 1997-2002, the ES was 0.79. The ES for grade 7 from 1998-2002 was 0.31; while the ES for grade 10, 1999-2002, was 0.14. These data are inconclusive, but do suggest that like national norm-referenced tests, state

criterion-referenced tests may take several years to show a positive impact on student achievement.

Camara and Powers (1999) concluded that coaching students for the SAT does in fact increase a student's SAT score. Washington State teachers have had at least four years experience in preparing for and teaching to the WASL. Further, between June 21 and June 30, 2001, the State Superintendent of Public Instruction selected 175 classroom teachers to attend a special, all expenses paid, WASL assessment training program in Mesa, Arizona (Brown, 2001, May 17). The impact of that training and student familiarity with the WASL appear to be similar to the SAT coaching findings reported by Camara and Powers (1999), especially at grade 4 where teachers have had over six years of "practice." Additionally, the state superintendent of public instruction initiated a "School Improvement Specialist" program in 2001-02. About 200 selected individuals are being paid \$30,000 a school year to work 1.5 days per week (or up to \$90,000 for 4.5 days) to help teachers and schools "improve student performance." No independent evaluation of this multi-million dollar expenditure has yet been conducted.

**Table 3**  
**Means, Standard Deviations, and Effect Sizes for 4th, and 7th Grade Mathematics and Reading Scale Scores on the Washington Assessment of Student Learning Comparing (1998—2001)**

<b>Grade Level and Subject</b>	<b>Spring 1998 Means</b>	<b>Spring 1998 Standard Deviations</b>	<b>Spring 2001 Means</b>	<b>Spring 2001 Standard Deviations</b>	<b>Effect Size</b>	<b>Effect</b>
4 - Mathematics	383.5	32.2	393.3	34.9	0.30	Small
4 - Reading	402.1	19.3	405.7	18.6	0.19	None
7 - Math	357.4	46.4	368.7	51.6	0.24	Small
7 - Reading	390.1	20.1	394.5	20.6	0.22	Small

**Table 4**  
**Means, Standard Deviations, and Effect Sizes for 10th Grade Mathematics and Reading Scores on the Washington Assessment of Student Learning Comparing (1999—2001)**

<b>Grade Level and Subject</b>	<b>Spring 1999 Means</b>	<b>Spring 1999 Standard Deviations</b>	<b>Spring 2001 Means</b>	<b>Spring 2001 Standard Deviations</b>	<b>Effect Size</b>	<b>Effect</b>
10 - Math	382.2	42.8	390.8	41.1	0.20	Small

10 - Reading	402.8	29.5	410.0	30.5	0.24	Small
--------------	-------	------	-------	------	------	-------

It appears that nearly four years would be required to show a small effect on student test performance; thus AYPTs may be elusive and troublesome. And how does a state account for a negative effect size year as the Washington data illustrate? The Washington State reform movement was legislated in existence in 1993. Thus, one could argue that during an eight year period little impact on student achievement is shown for the estimated \$1 Billion cost for the state's total school reform package.

A question needs resolution: "Is the small effect shown on the four year comparisons a function of increased teacher knowledge and possible compromise of WASL questions, or is the effect a function of growth in student academic achievement?" Obviously that question is not answered in this paper, but must be explored.

### Further Implications

This article only examines the effect size of student achievement as a consequence of longitudinal high-stakes testing in one state. To illustrate the gravity of the problem let us also examine the percent of students meeting the arbitrarily set standard scale score in math and reading for grades 4, 7 and 10 from 1998-2002. (See Table 5.)

**Table 5**  
**Percent of Students Meeting and Not Meeting Standard for 4th, 7th, and 10th Grade Mathematics and Reading on the Washington Assessment of Student Learning (1998—2002)**

<b>Grade Level And Subject</b>	<b>1998-99 % Meeting Standard</b>	<b>1999-2000 % Meeting Standard</b>	<b>2000-2001 % Meeting Standard</b>	<b>2001-2002 % Meeting Standard</b>
4 - Math	37.3	41.8	43.4	51.8
4 - Reading	59.1	65.8	66.1	65.6
7 - Math	24.2	28.2	27.4	30.4
7 - Reading	40.8	41.5	39.8	44.5
10 - Math	33.0	35.0	38.9	37.3
10 - Reading	51.4	59.8	62.4	59.2

Source: State Superintendent of Public Instruction, Education Profiles, Olympia, WA, 1998-2002.

The range of percentages of students meeting the standard for math in grade 4 is

from 37.3 in 1998-99 to 51.8 percent in 2001-02. For grade 7, the range is 24.2 to 30.4 percent. And in grade 10, the range in math is from 33.0 to 37.3 percent. Considering that yet about one-half of the fourth graders and almost two-thirds of the seventh and tenth graders do *not* meet the standard (fail) policy makers should be alarmed. In deed, on November 30, 2002 writers of the SRI International report concluded “The analyses further suggest that the grade 7 test was more challenging for the 7th graders than the grade 10 test was for the 10th graders” (page ii). The report also noted that several WASL test items on the 4th grade math test were not aligned with the Essential Academic Learning Requirements.

The state superintendent of public instruction informed the standard-setting groups that the WASL cut scores and standard-setting are guided by the belief that, “In all content areas the standard should reflect what a well taught, hardworking student should know and be able to do near the end of grade [4,7, or 10]” (SRI, 2002, p. 20). It is obvious that developmental, cognitive or behavioral perspectives are not being reflected in that guiding principle. Is faculty psychology now in vogue?

Orlich (2000) analyzed the 4th grade practice WASL items by using the developmental scales published by Epstein (2002, p. 184), Bloom’s Taxonomy (1954), and the NAEP scales (Campbell et al, 1998) and concluded that the bulk of items on the 4th grade WASL were well beyond their developmental level. Results of the 1998-99 WASL results confirmed that conclusion. Thus, the very high percentages of students “not meeting the WASL standard” may be traced to developmentally inappropriate items.

All children must take the WASL, with very few exceptions. The math effect size differences between grade-four minority children and white/Caucasian children range from 0.75 to 0.80, or about 28 percentile. For Special education the effect size difference between that population and white/Caucasian children is 0.96 or a 33 percentile difference (see Taylor, 2001, Tables 8-10 and 8-12). The latter is nearly one full standard deviation on the WASL. Finally, there is a correlation between reading and math WASL scores of 0.73 (Abbott and Joireman, 2001). Is math or reading being tested?

The cost-effectiveness of the WASL may be determined by the actual contract costs of the WASL with the Riverside Publishing Company. The initial contract was for about \$40 Million. The renewal (2001-05) is \$61,673,910 (Contract no.120-761, 2001). Thus the WASL cost is about \$102 Million per se. That figure does not include teacher salaries for time spent to prepare students or to administer the WASL, plus other bureaucratic costs associated for its administration. With an average 3.3 percentile gain per year, the cost per one percentile gain is about \$11 Million per year. Obviously, the cost-benefit calculation is challengeable; but no matter because the cost to meet any AYPT, as is mandated by federal laws (PL107-110), will be staggering. More importantly the money goes only to the test publishers. Not one dollar of the WASL reform expenditure goes to teachers to aid their instructional efforts.

Are the WASL Scores aberrations? Apparently not: Linn and Haug (2002) examined Colorado school buildings test scores over a four-year period and concluded the following:

“The performance of successive cohorts of students is used in a substantial number of states to estimate the improvement of schools for purposes of accountability. The estimates of improvement, however, are quite volatile. This volatility results in some schools being recognized as outstanding and other schools identified as in need of improvement simply as the result of random fluctuations. It also means that strategies of looking to schools that show large gains for clues of what other schools should do to improve student achievement will have little chance of identifying those practices that are most effective. On the other hand, schools that are identified as ‘in need of improvement’ will generally show increases in scores the year after they are identified simply because of the noise in the estimates of improvement and not because of the effectiveness of the special assistance provided to the schools or pressure that is put on them to improve.” (p. 35).

Similarly, Darling-Hammond (2003) reported that a doubt must be cast on state test gain scores because in Texas, students showed gains on the state mandated assessment, but did not make comparable gains on national standardized tests or the Texas college entrance test.

## **Conclusion**

Using an effect size measurement and Cohen’s (1988) nominal definitions, there is no effect, that is, no positive impact on yearly student achievement as a consequence of the longitudinal administration of the Washington Assessment of Student Learning (WASL). However, over a four-year period a small effect size does emerge. The results of this study parallel the findings of Amrein and Berliner (2002a) who analyzed the consequences of 18 states with high-stakes tests. They reported that in 17 of the 18 states, student learning remained at the same level as it was before the policy of high-stakes tests was instituted.

In two separate studies, the first of 28 states with high-stakes tests, Amrein and Berliner (2002b) concluded that these tests do little to improve student achievement. In a second study of 17 states (2002c) they concluded that high-stakes tests may actually worsen academic performance and exacerbate dropout rates. The affective dimensions of high-stakes tests should be of great concern to policy makers and educators alike.

Washington State policy makers must re-examine the intent of the WASL and the empirical data sets that analyze it to determine its educational worthiness and continued fiscal support (Orlich, 2000; Abbott & Joireman, 2001; Basarab, 2001; Fouts, 2002; & Keim, 2002). At the federal level there is need to examine the practicality, reasonableness and statistical logic of setting adequate yearly progress targets. The experience in the state of Washington apparently shows that setting AYP’s may not only be an assessment fallacy, but a gross misapplication of adapting the banking practice of applying compound interest calculations to human cognition. Is educational reform anything you can get away with?

## **Note**

The Author expresses appreciation to colleagues at Washington State University,



V. S. Manaranjan and Michael S. Trevisan for their critique, insights, and suggestions relating to this paper; and to the anonymous referees for their constructive feedback.

## References

Abbott, M. L. & Joireman, J. (2001, July). The relationships among achievement, low income, and ethnicity across six groups of Washington state students. Lynnwood, WA: Washington School Research Center, Technical Report #1.

Amrein, A. L. & Berliner, D. C. (2002a, March 28). High-stakes testing, uncertainty, and student learning. *Education Policy Analysis Archives*, 10(18). Retrieved April 10, 2002 from <http://epasa.asu.edu/epaa/v10n18/>

Amrein, A. L. & Berliner, D. C. (2002b, December). The impact of high-stakes tests on student academic performance: an analysis of NAEP results in states with high-stakes tests and ACT, SAT, and AP test results in states with high school graduation exams. Education Policy Research Unit, Education Policy Studies Laboratory, Arizona State University, Tempe, AZ. (EPSL-0211-126-EPRU).

Amrein, A. L. & Beliner, D. C. (2002c, December). An analysis of some unintended and negative consequences of high-stakes testing. Education Policy Research Unit, Education Policy Studies Laboratory, Arizona State University, Tempe, AZ. (EPSL-0211-125- EPRU).

Basarab, S. (2001, February). An overview of student assessment in Washington state. Unpublished Report. Citizens United for Responsible Education (CURE). Buriem: WA. Web site of CURE is at: <http://www.eskimo.com/~cure/>

Bloom, B. S. et al. (1956) *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. New York: David McKay.

Bloom, B. S. (1984). The 2 sigma problem: The search for methods of group instruction as effective as one-to-one tutoring. *Educational Researcher*, 13 (6), 4-16.

Brown, D. (2001, May 17). Staffing paper: MEA for Mesa, Arizona trip. Olympia, WA: Office of State Superintendent of Public Instruction files.

Camara, W. J. & Powers, D. (1999, July). Coaching and the SAT. Society for Industrial Psychology Inc. Retrieved August 27, 2002, from <http://stop.org/tip/backissues/tipjuly99/4camara.htm>.

Campbell, J. R., Voelke, K. E., & Donahue, P. L. (1998, August). *Report in brief: NAEP trends in academic progress, revised*. Washington, DC: National Center for Education Statistics, (NCES no. 998-530).

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

*Contract No. 120-761*. (2001, September 20). Riverside Publishing Contract with Superintendent of Public Instruction for WASL implementation.

Darling-Hammond, L. (2003). Standards and assessments: Where we are and what we need. *Teachers College Record*. Retrieved February 27, 2003 from <http://www.tcrecord.org/Contentasp?ContentID=11109>

Education Profile. State Superintendent of Public Instruction. Olympia, WA. Retrieved at <http://www.k12.wa.us/edprofile/state>

Epstein, H. T. (2002). Biopsychological aspects of memory and education. In S. P. Shohov, (Ed.). *Advances in Psychology Research*, vol. 11. New York: Nova, 181-186.

Fouts, J. T. (2002, April). The power of early success: A longitudinal study of student performance on the Washington assessment of student learning, 1998-2001. Lynnwood, WA: Washington School Research Center, Research Report #1.

Glass, G. V. (1980). Summarizing effect sizes. In R. Rosenthal, (Ed.). *New directions for methodology of social and behavioral science: Quantitative assessment of research domain*. San Francisco: Jossey-Bass.

Keim, W. G. (2002). School accountability and fairness: A policy study of the 2000 Washington state school accountability criteria. Pullman, WA: Washington State University, Unpublished Doctoral Dissertation.

Linn, R. L., Baker, E. V., & Betebenner, D. W. Accountability systems: Implications of requirements of the no child left behind act of 2001. *Educational Researcher*, 31 (6), 3-16.

Marzano, R. J., Pickering, D. J., & Pollock, J. E. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement*. Alexandria, VA: Association for Supervision and Curriculum Development.

Orlich, D. C. (2000). A critical analysis of the grade four Washington assessment of student learning. *Curriculum In Context*, 27 (2), 10-14

No Child Left Behind Act of 2001, Public Law No. 107-110, 115 Stat. 1425 (2002).

SRI International. (2002, November 30). A review of the Washington assessment of student learning in mathematics: Grades 7 and 10. Final Report. SRI Project Number: P12089. Olympia, WA: The Office of Superintendent of Public Instruction.

Taylor, C. S. & Lee, Y. (2001, October 18). Washington assessment of student learning grade 4, 2000 technical report. Olympia, WA: Office of the State Superintendent of Public Instruction.

Walberg, H. J. (1999). Productive teaching. In H. C. Waxman and H. J. Walberg, (Eds.), *New directions for teaching practice and research* (pp. 75-104). Berkeley: CA: McCutchan Publishing Corporation.

## About the Author

**Donald C. Orlich**

Science Mathematics Engineering Education Center  
Washington State University  
Pullman, Washington 99164-4237  
Telephone: (509) 335-4844 FAX: (509) 335-7389

E-mail: [dorlich@wsu.edu](mailto:dorlich@wsu.edu)

Donald C. Orlich is Professor Emeritus, Science Mathematics Engineering Education Center at Washington State University, Pullman. His academic focus is science education and instruction. He is senior co-author with R. Harder, R. Callahan, M. Trevisan and A. Brown of the forthcoming 7th edition of *Teaching Strategies: A Guide to Effective Instruction*, Houghton Mifflin, 2004. He authored *Designing Successful Grant Proposals*, ASCD 1996/2002. On March 2001, the 160,000 member ASCD honored him with the "The Affiliate Publications Award for Outstanding Affiliate Article" for "A Critical Analysis of the Grade Four Washington Assessment of Student Learning."

---

The World Wide Web address for the *Education Policy Analysis Archives* is  
[epaa.asu.edu](http://epaa.asu.edu)

**Editor: Gene V Glass, Arizona State University**

**Production Assistant: Chris Murrell, Arizona State University**

General questions about appropriateness of topics or particular articles may be addressed to the Editor, [Gene V Glass, glass@asu.edu](mailto:glass@asu.edu) or reach him at College of Education, Arizona State University, Tempe, AZ 85287-2411. The Commentary Editor is Casey D. Cobb: [casey.cobb@unh.edu](mailto:casey.cobb@unh.edu) .

**EPAA Editorial Board**

[Michael W. Apple](#)  
University of Wisconsin

[Greg Camilli](#)  
Rutgers University

[Sherman Dorn](#)  
University of South Florida

[Gustavo E. Fischman](#)  
California State University—Los Angeles

[Thomas F. Green](#)  
Syracuse University

[Craig B. Howley](#)  
Appalachia Educational Laboratory

[David C. Berliner](#)  
Arizona State University

[Linda Darling-Hammond](#)  
Stanford University

[Mark E. Fetler](#)  
California Commission on Teacher Credentialing

[Richard Garlikov](#)  
Birmingham, Alabama

[Aimee Howley](#)  
Ohio University

[William Hunter](#)  
University of Ontario Institute of

[Patricia Fey Jarvis](#)  
Seattle, Washington

[Benjamin Levin](#)  
University of Manitoba

[Les McLean](#)  
University of Toronto

[Michele Moses](#)  
Arizona State University

[Anthony G. Rud Jr.](#)  
Purdue University

[Michael Scriven](#)  
University of Auckland

[Robert E. Stake](#)  
University of Illinois—UC

[Terrence G. Wiley](#)  
Arizona State University

Technology

[Daniel Kallós](#)  
Umeå University

[Thomas Mauhs-Pugh](#)  
Green Mountain College

[Heinrich Mintrop](#)  
University of California, Los Angeles

[Gary Orfield](#)  
Harvard University

[Jay Paredes Scribner](#)  
University of Missouri

[Lorrie A. Shepard](#)  
University of Colorado, Boulder

[Kevin Welner](#)  
University of Colorado, Boulder

[John Willinsky](#)  
University of British Columbia

## **EPAA Spanish Language Editorial Board**

**Associate Editor for Spanish Language**

**[Roberto Rodríguez Gómez](#)**  
**Universidad Nacional Autónoma de México**

[roberto@servidor.unam.mx](mailto:roberto@servidor.unam.mx)

[Adrián Acosta \(México\)](#)  
Universidad de Guadalajara  
[adrianacosta@compuserve.com](mailto:adrianacosta@compuserve.com)

[Teresa Bracho \(México\)](#)  
Centro de Investigación y Docencia  
Económica-CIDE  
[bracho dis1.cide.mx](mailto:bracho dis1.cide.mx)

[Ursula Casanova \(U.S.A.\)](#)  
Arizona State University  
[casanova@asu.edu](mailto:casanova@asu.edu)

[Erwin Epstein \(U.S.A.\)](#)  
Loyola University of Chicago  
[Eepstein@luc.edu](mailto:Eepstein@luc.edu)

[Rollin Kent \(México\)](#)  
Universidad Autónoma de Puebla  
[rkent@puebla.megared.net.mx](mailto:rkent@puebla.megared.net.mx)

Javier Mendoza Rojas (México)  
Universidad Nacional Autónoma de  
México  
[javiermr@servidor.unam.mx](mailto:javiermr@servidor.unam.mx)

[J. Félix Angulo Rasco \(Spain\)](#)  
Universidad de Cádiz  
[felix.angulo@uca.es](mailto:felix.angulo@uca.es)

[Alejandro Canales \(México\)](#)  
Universidad Nacional Autónoma de  
México  
[canalesa@servidor.unam.mx](mailto:canalesa@servidor.unam.mx)

[José Contreras Domingo](#)  
Universitat de Barcelona  
[Jose.Contreras@doe.d5.ub.es](mailto:Jose.Contreras@doe.d5.ub.es)

[Josué González \(U.S.A.\)](#)  
Arizona State University  
[josue@asu.edu](mailto:josue@asu.edu)

[María Beatriz Luce \(Brazil\)](#)  
Universidad Federal de Rio Grande do  
Sul-UFRGS  
[lucemb@orion.ufrgs.br](mailto:lucemb@orion.ufrgs.br)

Marcela Mollis (Argentina)  
Universidad de Buenos Aires  
[mmollis@filo.uba.ar](mailto:mmollis@filo.uba.ar)

[Humberto Muñoz García \(México\)](#)  
Universidad Nacional Autónoma de  
México  
humberto@servidor.unam.mx

[Daniel Schugurensky](#) (Argentina-Canadá)  
OISE/UT, Canada  
dschugurensky@oise.utoronto.ca

[Jurjo Torres Santomé](#) (Spain)  
Universidad de A Coruña  
jurjo@udc.es

Angel Ignacio Pérez Gómez (Spain)  
Universidad de Málaga  
aiperez@uma.es

[Simon Schwartzman](#) (Brazil)  
American Institutes for  
Research–Brazil (AIRBrasil)  
simon@sman.com.br

[Carlos Alberto Torres](#) (U.S.A.)  
University of California, Los Angeles  
torres@gseisucla.edu

EPAA is published by the Education Policy Studies  
Laboratory, Arizona State University