



Changes in Teachers' Culturally Congruent Instruction Over Three Years in a Professional Development Project



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Introduction/Theoretical Framework

American Indian students as a group consistently underachieve compared to their White peers on standard measures of science achievement (Rampey, Dion & Donahue, 2009). Cultural incongruence between schools and ethnically diverse students' home cultures is posited as one set of factors that hinders student achievement. Some empirical evidence suggests that culturally congruent instruction (CCI) improves Indigenous students' achievement in science and math (e.g., Lipka & Adams, 2004; Gilbert, 2005). While it seems logical to increase the use of CCI in classroom instruction, studies suggest that improving teachers' proficiency with CCI is a challenging task (e.g., Sleeter, 2001). This challenge is exacerbated by the high rate of cultural mismatch between teachers and their Indigenous students. This study investigated the effects of professional development on teachers' CCI.

Methods

Study participants were ninety K-8 educators in two cohorts teaching in schools on or near three American Indian reservations in Montana. Teachers worked closely with tribal elders and tribal science professionals for three years in a variety of PD activities addressing a range of culturally relevant topics. Treatment and comparison teachers completed an annual self report survey known as the Culturally Congruent Instruction Survey (CCIS).



Results/Conclusions

An ANOVA on the first two years of data showed a statistically significant greater overall mean score for Cohort 1 treatment teachers versus Cohort 2 treatment teachers and Comparison 2 teachers. These results were not surprising since by spring 2009 the first cohort had been in the project for two years while the second cohort was new to the project. Scores for the Cohort 2 treatment teachers showed no statistically significant difference versus the Cohort 2 Comparison teachers at that time. By spring 2011, Cohort 2 treatment teachers showed a statistically significant greater mean versus the Comparison 2 teachers and no statistically significant difference with the mean for the Cohort 1 treatment teachers, suggesting that Cohort 2 treatment teachers had grown in their overall cultural competence during those two years of project membership to attain CCI levels similar to those of Cohort 1 treatment teachers (Table 1). Regression analysis on a predictive model with six demographic variables resulted in an overall Pearson's $r = .46$, indicating medium correlation with CCI. A negative correlation with the "Proximity to reservation" variable reflects greater CCI gains for the off reservation teachers who started with lower mean scores (Table 2).

Dependent Variable	Comparison	Mean Difference	Standard Error	Significance
2009 CCIS Means	T1 versus T2	.69017*	.14102	.000
	T1 versus C2	.79404*	.15969	.000
	T2 versus C2	.10388	.15109	.494
2010 CCIS Means	T1 versus T2	.72243*	.14935	.000
	T1 versus C2	.98658*	.16912	.000
	T2 versus C2	.26415	.16001	.102
2011 CCIS Means	T1 versus T2	.18213	.16700	.278
	T1 versus C2	.88792*	.18910	.000
	T2 versus C2	.70580*	.17892	.000

Table 1 - ANOVA results of CCIS scores comparison - *denotes significance

Variable	beta	t	Significance
Treatment Group	.434*	4.172	.000
Teacher age	-.001	-.012	.990
Teacher gender	.059	.584	.561
Proximity to a reservation	-.243*	-2.350	.021
Years teaching science	-.015	-.188	.907
Teachers self efficacy	.022	.214	.831

Table 2 – Multiple regression results for demographic variables - *denotes significance

Ongoing and Future Research Priorities

Project personnel are analyzing the PD model used in this study to characterize the relative influence of its elements on teachers' CCI. Research continues on the relationships between teacher demographics and the development of CCI. Further, project personnel plan to study the relative impacts of activities on the seven CCIS scales. Findings will be synthesized into a model of PD designed to improve CCI.

References

- Gilbert, W. S. (2005). Native Science Connections Research Project: Integrating relevant cultural knowledge into the science curriculum for grades 4-6th. http://www2.ed.gov/rschstat/research/pubs/oieresearch/conference/gilbert_200501.pdf
- Lipka, J. Webster, J.P., & Yanex, E. (2005). Factors affecting Alaska Native students' mathematical performance. *Journal of American Indian Education*, 44 (1-8)
- Rampey, B.D., Dion, G.S., & Donahue, P.L. (2009). *NAEP 2008 Trends in Academic Progress* (NCES 2009-479). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education, Washington, D.C.
- Sleeter, C. (2001a). Epistemological diversity in research on preservice teacher preparation for historically underserved children. *Review of Research in Education*, 25 (209-250)