https://doi.org/10.48009/2_iis_2007_76-82

GLOBALIZING PROFESSIONAL DEVELOPMENT: THE EVALUATION OF A COLLABORATIVE COMPUTER-MEDIATED PROFESSIONAL DEVELOPMENT PROGRAM

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ABSTRACT

Does long-term professional development in educational technology impact teachers' integration of technology in the classroom? According to a recently published 5-year study, the answer is "Yes!" This paper presents the evaluation results of a three-year, hybrid professional development program established through an innovative partnership between an East Texas school district and and a South Texas university that are 500 miles apart. The report revealed that more than 350 teachers who participated in the professional development program, significantly increased their integration of technology and utilized research-based instructional strategies to enhance student learning. Based on its success, the program serves as a conceptual model for collaboratives between school districts and institutions of higher education that maximize resources and transcend distance for the delivery of effective professional development and continuing education for classroom teachers.

Keywords: Distance Education, e-Learning, Collaboration Technologies, Employee Training, Computer-based Instruction, Educational Technology, Professional Development, Teacher Education,

INTRODUCTION

The rapid social, cultural, and economic changes spawned by technology, require that teachers learn more and at a faster rate to prepare students for the demands of globalization. Technological solutions offer options that require that traditional methods of professional development be transcended. Technology is having a significant impact on the way teachers plan and deliver instruction. Consequently, the question of whether or not technology should be integrated into the public school curriculum is no longer relevant. Instead, the focus needs to be on ensuring that technology is used effectively to promote student achievement and create new learning opportunities. Teacher quality is the most important factor impacting student learning [2]. Therefore, effective and sustained professional development becomes a key factor in getting teachers to use technology to improve the quality of learning in the classroom. Lack of professional development for educational technology is one of the most serious obstacles to successful integration of technology into the curriculum [3]. However, traditional faculty training or one-time-only workshops are not having an impact on teachers' ability to use technology or integrate it into their lesson plans. A well-planned, ongoing professional development program that is tied to the school's curriculum goals, designed with built-in evaluation, and sustained by adequate financial and staff support is essential if teachers are to use technology appropriately to promote learning [6].

This paper details the results of the University of Memphis' Center for Research in Educational Policy Evaluation Report [1, 5] of a three-year hybrid professional development program established through an innovative partnership between the West-Orange Cove Consolidated Independent School District (WOCCISD) and The University of Texas at Brownsville/Texas Southmost College (UTB/TSC) from 2001 to 2004. The results demonstrated that more than 350 teachers who participated in the long-term professional development program were able to significantly increase the integration of technology into their teaching, and utilize the research-based instructional strategies to enhance student learning. The results also demonstrate that a conceptual model can be developed from this program for partnerships between public school districts and institutions of higher education for the delivery of effective professional development and continuing education for classroom teachers.

THE WOCCISD-UTB/TSC PROFESSIONAL DEVELOPMENT PROGRAM

Overview

Funded by a 2.5 million dollar Stark Foundation grant, The West-Orange Cove Consolidated Independent School District and The University of Texas at Brownsville/Texas Southmost College Professional Development Program, provided face-

to-face and online professional development training to more than 350 teachers from eight public and private schools located in and around the West Orange Cove school district over a three year period. The WOCCISD-UTB/TSC Professional Development Program consisted of three phases: 1) a foundation training phase; 2) a technology integration phase; and 3) an implementation phase. During the first phase, the participating teachers received "foundation" training in basic computer operations and software applications on-site by West-Orange Cove staff. The training dealt primarily with developing teachers' skills in using technology in the classroom. The "integration" training phase, delivered online by the faculty of the Masters in Educational Technology from The University of Texas at Brownsville/Texas Southmost College, built on teachers' newly acquired foundational skills and emphasized using technology in the classroom to support student-centered teaching methods that promote higher-level learning outcomes. The integration training was facilitated by the Educational Technology faculty at the two institutions through an online graduate-level course that focused on integrating instructional technology into teaching. After teachers completed the foundation and integration training phases, they entered the "implementation" phase of the program. During this phase, teachers put into practice their new knowledge and skills by integrating technology into teaching, emphasizing higher-order learning and student-centered activities.

The Professional Development Program Evaluation Plan

The Center for Research in Educational Policy collected and analyzed data at the end of the first and third years of the professional development program, which began in 2001 and ended in 2004. In order to determine the sustainability of professional development program's impact a follow-up study was conducted 2 years later in 2006. Data from these reports were further analyzed to assess the effectiveness of a hybrid professional development program that used computer-mediated communications and distance learning to facilitate a sustained, long-distance, professional development program between two institutions that were not in geographical proximity to one another. This paper focuses on 3 of the 5 research questions from the Center for Research in Educational Policy report, as they pertain specifically to teacher adoption of educational technology for classroom instruction:

1. *To what degree and in what manner was technology integrated with classroom instruction by teachers?*
2. *To what degree did teachers use methodologies that stressed higher-order learning and student-centered learning activities?*
3. *To what degree did teachers acquire the technology skills specified in the Texas state standards?*

Five instruments were used to collect the evaluation data which consisted of three classroom observation measures and two teacher surveys. The *School Observation Measure*, *Survey of Computer Use*, and *Rubric for Student-Centered Activities* were completed for the targeted observations. These consisted of prearranged, one-hour sessions in which teachers demonstrated a prepared lesson using technology. Observation forms were completed every 15 minutes during the one-hour lesson. Two teacher surveys, the *Teacher Technology Questionnaire* and the *Technology Skills Assessment* were also administered during faculty meetings at each school.

Results of the Evaluation

The *School Observation Measure* was developed to determine the extent to which different common and alternative teaching practices are used during a targeted lesson [7]. The instrument was used to record observations of classroom instruction during prearranged one-hour sessions in which teachers demonstrated a prepared lesson for which they were asked to use technology. The observers recorded classroom events and activities descriptively. Forms were completed at 15-minute intervals throughout the lesson to record the use or non-use of 24 target strategies and the degree to which a high level of academically focused class time and student attention/interest was observed. At the conclusion of the one-hour visit, the observer used a Data Summary Form to summarize the frequency with which each of the strategies was observed. The frequency was recorded via a 5-point rubric that ranged from (0) Not Observed to (4) Extensively Observed. A summary of the results is presented in Figure 1.

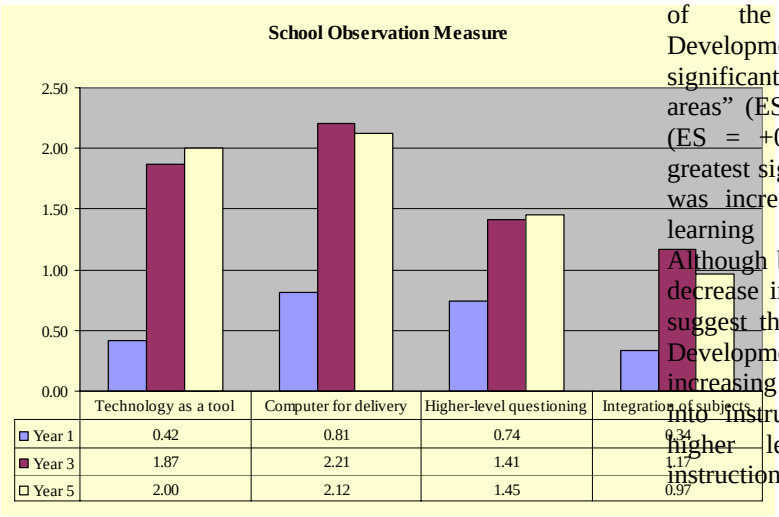


Figure 1. A comparison of Years 1, 3 and 5 results for the School Observation Measure [1, 5]

To determine whether significant changes occurred between Years 1, 3, and 5, a series of ANOVAs were conducted on the multiple items of the *School Observation Measure*. The most significant differences between Year 1 and Year 3 were observed in increased classroom use of "technology as a tool for learning" (ES = +0.95) and as a means of "instructional delivery" (ES = +0.89), both key goals of the WOCCISD-UTB/TSC Professional Development Program. Year 3 results also revealed significantly greater use of "integration of subject areas" (ES = +0.60) and "higher-level questioning" (ES = +0.47) during classroom instruction. The greatest significant difference between Years 1 and 5 was increased observed use of "technology as a learning tool," and "higher-level questioning." Although between Years 1 and 3, there was a slight decrease in two of the four indicators, overall, data suggest that the WOCCISD-UTB/TSC Professional Development Program had a positive impact on increasing the teacher's integration of technology into instruction and demonstration of the use of higher levels of questioning techniques for instruction [1, 5]

A companion instrument to *School Observation Measure*, the *Survey of Computer Use* was used to record in 15-minute intervals, students' access to, ability with, and use of computers. The survey includes a rubric designed to assess the degree to which an activity reflects "meaningful use" of computers as a tool to enhance learning. The rubric has four levels: 1) Low-level use of computers; 2) Somewhat meaningful; 3) Meaningful; and 4) Very meaningful. A summary of the rubric results is presented in Figure 2.

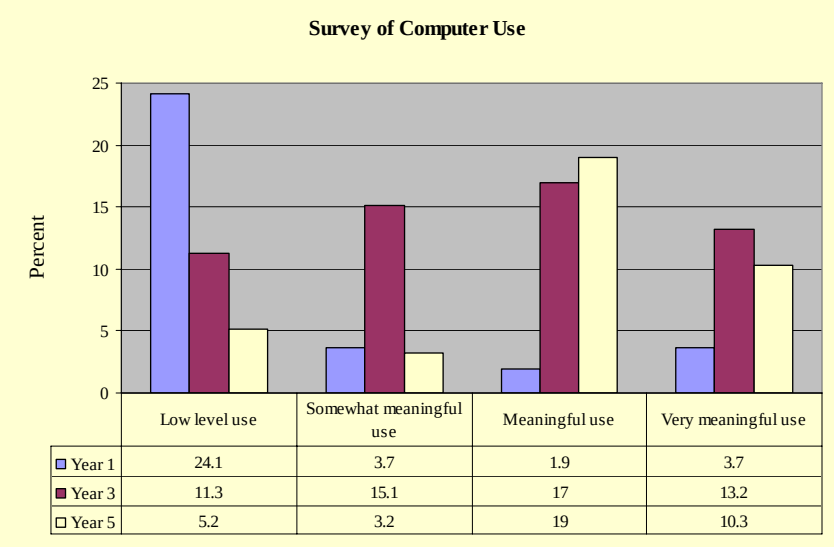
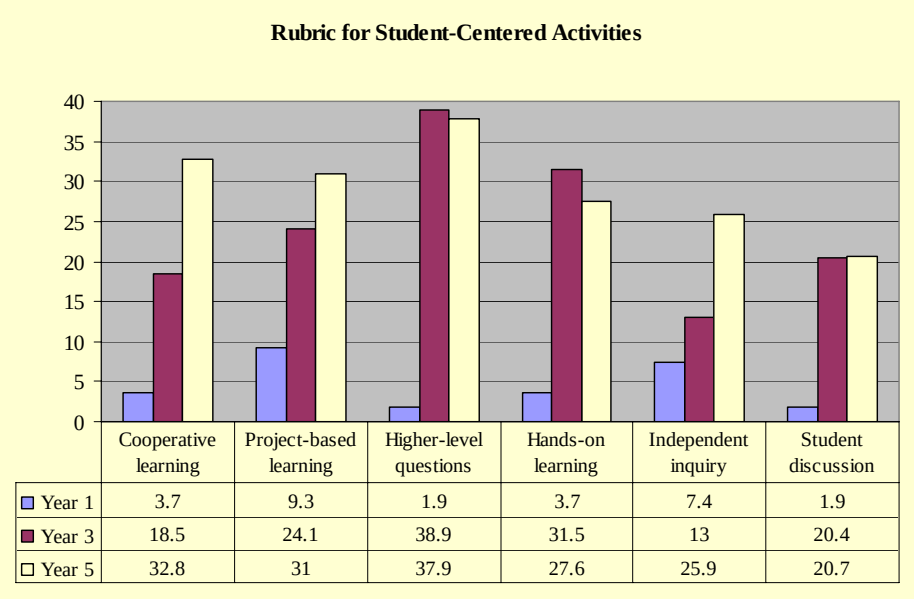


Figure 2. A Comparison of Years 1, 3, and 5 Activities That Used Technology in Meaningful Ways [1, 5]

The *Survey of Computer Use* rubric results suggest that progress was made between Years 1 and 3 with regard to technology integration efforts. Specifically, comparisons between Years 1 and 3 data indicate that teachers "very meaningful use" of technology increased significantly (ES = +0.45) from 1.9 percent in Year 1 to 17.0 percent in Year 3. Instances of "very meaningful use" of technology also increased from 3.7 percent to 13.2 percent between Years 1 and 3, while "low level use" decreased from 24.1 percent to 11.3 percent. The SCU results also suggest that significant progress was also made between Years 1

and 5 with regard to teachers' and students' integration of technology. The data revealed that students increased in Internet use for research from 0% in Year 1 to 15.5% in Year 5. Similarly, teachers increasingly integrated meaningful uses of computers (Year 1 = 1.9% to Year 5 = 19%).

For the next assessment, data from the *Rubric for Student-Centered Activities (RSCA)* were collected during prescheduled lessons in which teachers were asked to use technology. Results addressed the quality and depth of observed strategy applications and the percentage of sessions in which technology was used with the observed strategy. The *Rubric for Student-Centered Activities* was used in targeted observations of lessons that included the use of technology to support learning. A summary of the results is presented in Figure 3.



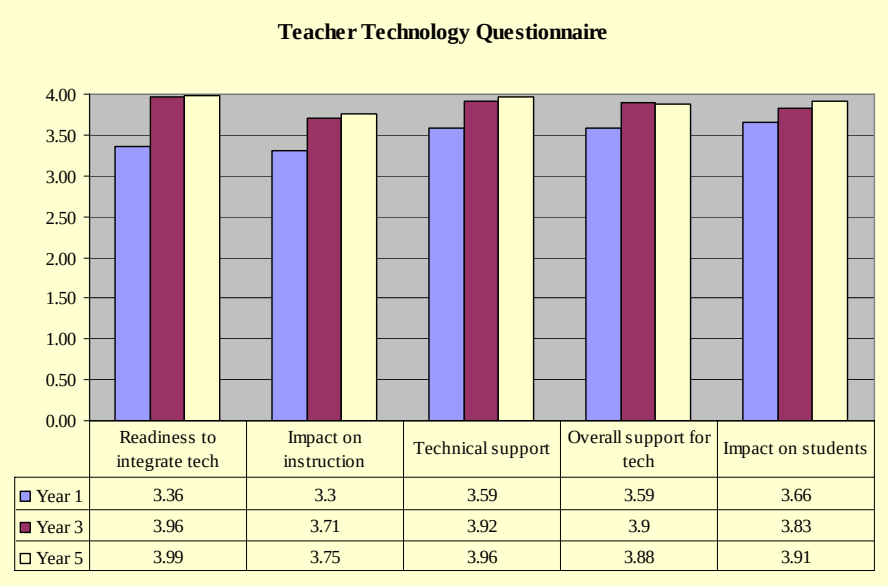
	Cooperative learning	Project-based learning	Higher-level questions	Hands-on learning	Independent inquiry	Student discussion
Year 1	3.7	9.3	1.9	3.7	7.4	1.9
Year 3	18.5	24.1	38.9	31.5	13	20.4
Year 5	32.8	31	37.9	27.6	25.9	20.7

Figure 3. Years 1, 3, and 5: Percent of Rubric for Student-Centered Activities that used Technology [1, 5]

As demonstrated by Figure 3, the *Rubric for Student-Centered Activities* results revealed a positive trend in the frequency of student-centered strategy implementation as demonstrated by increases in mean scores between Years 1 and 3 for all of the strategies. The most notable gains were in the increased frequency with which teachers integrated "higher-level questioning" 37% percent higher and "hands-on learning" with an increase of 27.8%. The percentages of student-centered teaching strategies that used technology for Year 5 ranged from 20.7% (student discussion) to 37.9% (higher-level questioning strategies), which indicate moderate to moderately high levels of continued quality and effectiveness from Year 3 to Year 5. For Year 5, "cooperative learning" (32.8%) and "project-based learning" (31%) were assessed as the other most meaningful strategies followed by "experiential, hands-on learning" (27.6%) and "independent inquiry" (25.9%). Technology was used slightly less frequently in conjunction with "student discussion," as these uses were observed in 20.7% of the visits. Although this result does not reflect a significant difference from Year 3, it is a significant increase from Year 1. "Hands on learning" dropped slightly (3.9%) from Year 3 to Year 5. However, there was a significant increase in the use of technology to support Student-Centered Activities strategies from Year 1 to Year 5. For example, in Year 5, in over 30% of the observations, technology was used to support "higher level questioning strategies" (37.9%), a 36% increase from Year 1; the use of "cooperative learning" (32.8%) increased 29.8%; and there was a 21.7% increase in "project-based learning." In addition, teachers used technology to support "independent inquiry" (25.9%) during more than one-fourth of the observations in Year 5, an increase of 18.5%. The RSCA results revealed a positive trend in the quality of strategy implementation. The scores for the six RSCA strategies were directionally higher than the first year, indicating continued growth toward teacher competency with non-traditional instructional strategies. The most striking RSCA result is the increased usage of technology to support higher-level questioning. Also noteworthy is the higher quality with which teachers implemented cooperative and project-based learning after five years as compared to the first year of program participation. These results suggest that the WOCCISD-UTB/TSC

Professional Development Program successfully prepared teachers to implement above average student-centered activities.

The *Teacher Technology Questionnaire (TTQ)* was designed to capture teacher perceptions regarding five areas: 1) impact of technology on classroom instruction; 2) impact of technology on students; 3) teacher readiness to integrate technology; 4) overall support for technology; and 5) technical support. A total of 207 teachers completed the survey. A summary of the results is presented in Figure 4.

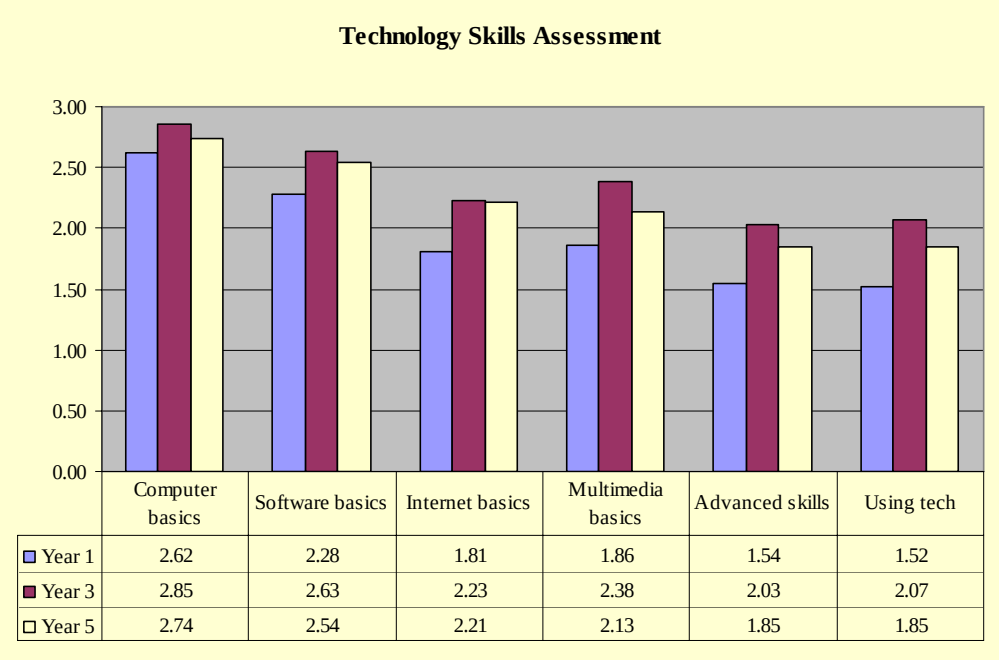


	Readiness to integrate tech	Impact on instruction	Technical support	Overall support for tech	Impact on students
Year 1	3.36	3.3	3.59	3.59	3.66
Year 3	3.96	3.71	3.92	3.9	3.83
Year 5	3.99	3.75	3.96	3.88	3.91

Figure 4. Teacher Technology Questionnaire: Years 1, 3, and 5 Results [1, 5]

A significantly higher level of teacher perceptions was demonstrated for Year 3 as compared to Year 1 for all areas of the *Teacher Technology Questionnaire*. The greatest percent of change from Year 1 to Year 3 was observed in teacher "readiness to integrate technology" (ES = +0.73). Also noteworthy was an increase in agreement with the "impact [of technology] on classroom instruction" (ES = +0.51). The TTQ results reflect very positive Year 1 to Year 5 changes in teacher attitudes. Specifically, there were significant increases in teacher readiness to integrate technology into their instruction, belief that technology had a positive impact on instruction and student learning, and belief that their schools had adequate technology support and that there was overall support for classroom use of technology. These results provide further evidence supporting the positive impact of the WOCCISD-UTB/TSC Professional Development Program on the integration of technology into teaching.

Another assessment employed in the study was the *Technology Skills Assessment (TSA)* that assessed teacher perceptions of their ability to use technology based on the competencies of the state-mandated TEKS (Texas Essential Knowledge and Skills) Technology Applications for 3rd through 5th grade students. The survey asked teachers to rate "How easily…" they could complete 47 computer-related tasks divided into six basic areas: 1) computers; 2) software; 3) multimedia; 4) Internet; 5) advanced skills; and 6) using technology for learning. Teachers were also asked to rate "How well..." they understood three technology-related policy and ethics items. A summary of the results is presented in Figure 5.



	Computer basics	Software basics	Internet basics	Multimedia basics	Advanced skills	Using tech
Year 1	2.62	2.28	1.81	1.86	1.54	1.52
Year 3	2.85	2.63	2.23	2.38	2.03	2.07
Year 5	2.74	2.54	2.21	2.13	1.85	1.85

Figure 5. Results of the Technology Skills Assessment: Years 1, 3, and 5 [1, 5]

For Years 1 to 3, inferential analyses revealed significant differences between years on all dimensions. Year 1 to Year 3 results showed increases in teacher confidence in completing technology-related tasks, specifically related to "Internet basics" (ES = +0.82), "software basics" (ES = +0.65), and "using technology for learning" (ES = +0.90). According to the Program Evaluation Report [1] to determine if significant differences existed between Years 1 and 5, A MANOVA and follow-up univariate analyses were conducted to compare the two sets of data. Table 5 provides a summary of the results. The outcomes revealed that at the multivariate level, there was a significant difference between year 1 and year 5 ($p < .001$). Univariate outcomes indicated that technology skills assessed in all six dimensions were significantly greater in Year 5: computer basics ($p < .001$, $ES = +.40$), software basics ($p < .001$, $ES = +.56$), multimedia basics ($p < .001$, $ES = +.56$), Internet basics ($p < .001$, $ES = +.66$), advanced skills ($p < .001$, $ES = +.59$), and using technology for learning ($p < .001$, $ES = +.63$). The TSA results also show positive Year 1 to Year 5 impacts of the WOCCISD-UTB/TSC Professional Development Program on teacher technology skills. As seen in the Effect Sizes, the greatest changes occurred in teacher confidence to use technology for learning and to complete advanced skills.

SUMMARY AND CONCLUSIONS

This paper documented how the West-Orange Cove Consolidated Independent School District partnered with The University of Texas at Brownsville/Texas Southmost College to develop a sustained online and face-to-face professional development program. Although the program ended after 3 years, the results indicate that the impact of the professional development program were sustained at least 2 years beyond the teachers integration training. The purpose of the evaluation was threefold: 1) to provide formative evaluation data to the participating schools to serve as a basis for improvement planning and as documentation of their accomplishments and progress in getting teachers to support student-centered teaching methods that promote higher-level learning outcomes; 2) to provide cumulative evidence of the implementation and outcomes of the participating schools in getting teachers to adopt technology for teaching and learning; and 3) to assess the effectiveness of a hybrid model for professional development partnerships between public school systems and institutions of higher education that are not in geographical proximity to one another.

With regard to Research Question 1 (*To what degree and in what manner was technology integrated with classroom instruction by teachers?),* the observation data revealed significant increases between Years 1 and 3, as well as the sustainability 2 years later in Year 5, for teacher use of computers for instructional

delivery and in student use of computers as a learning tool. Also significant was students' use of technology as a tool to enhance learning. Another noteworthy increase in the use of computers is seen in data from the *Rubric for Student-Centered Activities*, which revealed that during Year 5 as compared to Years 1 and 3, teachers more frequently supported student-centered activities with technology. Not only were teachers more frequently integrating technology into their instruction, they were doing so at a significantly more meaningful level. Likewise, for Research Question 2 (*To what degree did teachers use methodologies that stressed higher-order learning and student-centered learning activities?),* Years 3 and 5 results revealed significant increases in the frequency with which activities that fostered critical thinking and student engagement were observed. Most notable were significant increases in the number of visits in which the teachers utilized higher-order questioning and had students use technology as a learning tool. In addition, Year 3 teachers more frequently assumed the role of a facilitator and engaged students in discussions while continuing to provide experiential hands-on activities. Lastly, for Research Question 3 (*To what degree did teachers acquire the technology skills specified in the Texas State standards?)* Year 3 *Technology Skills Assessment* results indicated that teacher confidence on all six categories of technology skills continued to significantly increase when compared to Year 1. The greatest difference was seen in teacher confidence in using technology for learning.

The success of the WOCCISD-UTB/TSC Professional Development Program, can in part, be attributed to its research-based design. Researchers [4] identified the following significant characteristics of effective professional development programs, by stating that they: were integrated into the district's goals to improve education; were guided by a coherent long-term plan; were designed according to teacher-identified needs; provided a strong foundation in subject content and methods of teaching; were informed by research on teaching and learning; were designed around collaborative problem-solving; enabled teachers to work with colleagues, in and beyond their school building; were continuous and ongoing, providing follow-up support for further learning; provided sufficient time and other resources; and evaluated ultimately on the basis of their impact on teacher effectiveness and student learning. The outcome of the WOCCISD-UTB/TSC Professional Development Program supports a conceptual model for using computer-mediated communications and distance learning to facilitate long-distance partnerships that are mutually beneficial. The computer-mediated collaborative professional development program described in this paper demonstrates that inter-institutional collaborations can be formed with partners anywhere. It is now possible to form partnerships between institutions based on mutual goals and values, not solely by geographical location. School districts can look beyond their boundaries to find the resources and professional development they need to help their students develop the skills they need to be competitive globally.

REFERENCES

1. Allen, L., Lowther, D. L., Slawson, D., & Strahl, D. L. (2006). *West Orange Collaborative STARK Program 2001-2006 evaluation report.* Center for Research in Educational Policy, The University of Memphis.
2. Darling-Hammond, L., & Berry, B. (1998). *Investing in teaching.* Retrieved August 15, 2005 from www.edweek.org/ew/vol-17/37darlin.h17
3. Fatemi, E. (1999). Building the digital curriculum. *Education Week, XIX* (4), 5-8.
4. Hawley, W. D., & Valli, L. (1999). The essentials of effective professional development: A new consensus. In
5. L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 127-150). San Francisco, CA: Jossey-Bass.
6. Lowther, D. L., Thompson, L., Ross, S. M., McDonald, A., & Wang, W. (2004). *West Orange Collaborative STARK Program 2003-2004 evaluation report.* Center for Research in Educational Policy, University of Memphis.
7. Rodriguez, G., & Knuth, R. (2000). *Critical issue: Providing professional development for effective technology use*. Naperville, IL: North Central Regional Educational Laboratory.
8. Ross, S. M., Smith, L. J., & Alberg, M. (1999). *The school observation measure*. Memphis, TN: Center for Research in Educational Policy, The University of Memphis.