What immediate & contextual factors limit or.

Designing bridges

Do students improve their 21st Century Skills as a result of their PISA teachers’ post-test scores?

The PISA teachers’ post-test scores improved significantly more than the comparison teachers’ post-test scores, even after their slightly higher pre-test scores were taken into account.

The greatest number of activities used by any PISA teacher was 21, or 81% of the total number of activities; of the 26 activities, 21 were science & 5 were engineering; teachers implemented an average of 14 of the 26 activities.

Since all teachers were exposed to the same lessons in their workshops, implementing these lessons in their classrooms played a major role in the increased post-test results.

Teachers’ content knowledge had an effect on students’ post-test scores.

Students mentioned in the survey that the science & engineering lessons promoted problem solving, critical thinking, collaboration & communication in their classrooms, which are crucial skills for students who will compete in the global economy of the 21st century.

STUDENTS: A total of 1,365 students (622 PISA students & 753 comparison students) took the pre-test at the beginning of the school year, September 2009.

All 39 lead PISA teachers & 36 of the 38 comparison teachers returned both tests; therefore, the total number of student tests that could be matched (pre with post) was 1,179 (63 PISA students & 541 comparison students).

Instruments

- **Mathematics & 5 engineering; science & science-related knowledge & expectations among STEM faculty & CIESE.
- **Unseen mathematics & computer technology preparation of teachers grades 3-8.
- **Varying curricula, pacing charts, pedagogical focus of participating 12 districts.
- **Contextualizing engineering within varied science curricula/programs.
- **Vacancy in co-in position due to changes at NJ Department of Education.
- **Transition to new external evaluator in Year 1.

**PISA** aims to increase the academic achievement & 21st century skills of elementary & middle school students in science & engineering by enhancing science content knowledge, pedagogical content knowledge & attitudes & beliefs of teachers about STEM subjects.

PISA RESEARCH QUESTIONS

1. Does a project which uses scientific inquiry & the engineering design process (EDP) contribute to an increase in teachers’ content knowledge of science & engineering?

2. To what extent do teachers’ beliefs & attitudes towards teaching science & engineering change over time?

3. What are teachers’ conceptions of 21st Century Skills as they apply to teaching & learning? To what extent do they change over time as a result of instructional interventions?

4. What immediate & contextual factors limit or facilitate a teacher’s success in changing classroom practice?

COURSES

1. Fundamental Principles of Physical Science
2. Fundamental Principles of Earth Science
3. Energy Production & Consumption
4. Understanding Global Change
5. Engineering Solutions to the Challenges of Energy & Global Change