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Applying Technology to Alleviate the Problems Created by the Shortage of Qualified Math and Science Teachers

Jack A. Gerlovich
Iowa Department of Public Instruction

The Problem

In November, 1982, a report (Gerlovich *et al.*, Note 1) was delivered to then Governor Robert D. Ray outlining the problems in science education in Iowa and recommendations for addressing them. Among the major needs outlined were:

1. Salaries of teachers in short supply must be made competitive with those in the private sector.
2. Preservice scholarship and loan forgiveness programs must be initiated for science teaching.
3. Cost effective, continuous, inservice programs for upgrading current science teachers should be initiated.
4. Prospective science teachers should complete coursework for the DPI "all sciences" approval to improve their employability.
5. Local schools should require 2 years (units) of science (1 biological, 1 physical science) for graduation; 3 units for those students who are college bound (Gerlovich & Unruh, Note 2).

Recommendations

Based upon the Governor's report, the Department of Public Instruction felt that the state science consultant should identify or establish programs which would begin to address the needs of that report. It was felt that physics was the subject in greatest need of immediate assistance. In September 1982, a task force was identified to prioritize needs and to begin pilot programs.

A teacher's guide was developed which would provide physics teachers with basic physics content, student application activities, and teacher's notes. Videotapes of unusual demonstrations and student activities which would be difficult to replicate and computer software activities were compiled. Six pilot schools in Southern Prairie AEA assisted in refining the materials during the 1982-83 school year. An interactive telephone system was established to communicate the materials to the teachers. Each school was provided with a telephone, telephone amplifier, teacher's guide, videotapes, and computer software. Teachers received a one hour call at the beginning of each of 10 units to upgrade them in physics content, walk them through physics activities, and familiarize them with video and computer materials.

The program is unique in that it upgrades teachers in physics content, provides student activities which emphasize "application" of physics content, incorporates contemporary technology, is cost effective, on-going, and has been found to be very effective by the teachers in the pilot schools.

Funding has been provided by the Iowa legislature to expand the pilot to 45 centers during the 1983-84 academic year.

Summary

Crisis is a time for change — not for trepidation! With the talented, concerned and dynamic scientists and science educators we have in Iowa, it is merely a matter of focusing direction to resolve this crisis. We look forward to progressive change, tempered with stability.

If you have questions concerning these projects, please contact any of the symposium presentors.

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References

- Howe, T.G., and J. Gerlovich. 1983. Science and math teachers: A national survey of supply and demand. *NCSIE Inservice*. Pages 10-13. National Council of States on Inservice Education.
- Today's problems, tomorrow's crises. 1982. A report of the National Science Board Commission on Precollege Education in Mathematics, Science and Technology, Washington D.C.

Reference Notes

1. Gerlovich, *et al.* 1982. The crisis in science education: problems and recommendations. Iowa Academy of Science report to Governor Robert D. Ray.
2. Gerlovich, J. and R. Unruh. Applying technology to alleviate the problems created by the shortage of qualified science teachers. Publication pending.