

Repairing the Illinois High School Physics Teacher Pipeline

Recruitment, preparation and retention of high school physics teachers: The Illinois model.

EXECUTIVE SUMMARY

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Presented by the ISAAPT Ad Hoc Committee on High School
Physics Teacher Recruitment, Preparation, and Retention
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The Illinois Section of the American Association of Physics Teachers (ISAAPT) held a two-day special session aimed at repairing the Illinois high school physics teacher pipeline. An Ad Hoc Committee was established by the ISAAPT at its spring 2004 Section meeting for the purpose of reviewing and making recommendations in light of physics teacher shortages being experienced in the State of Illinois. The committee was charged at looking at recruitment, preparation, and retention practices for high school physics teachers in Illinois.

Physics Teacher Shortage in Illinois

The shortage of physics teachers in Illinois is chronic and growing worse. Teachers are leaving the profession, moving up to administrative positions, moving out of districts, and retiring. The enrollment in Illinois high schools is growing thus requiring additional physics teachers that exacerbates the problem of physics teacher supply. Students are taking physics in increasing numbers. More females and minorities than ever before are taking courses in physics. These factors, coupled with the fact that teacher education institutions across the State are not graduating enough qualified physics teachers, has led to a very significant shortage of qualified physics teachers.

Key Findings: Teacher Candidate Recruitment

One of the committee members, in preparation for the special session, conducted two pilot surveys. One survey was administered to physics teacher education candidates and the other dealt with in-service teachers of physics and/or physical science. The first survey was completed by 24 of 33 declared physics teacher education candidates. The second survey was eventually completed by 23 of the approximately 80 in-service teachers contacted. Findings from both surveys paralleled one another in important dimensions.

Teacher Candidates: The teacher candidate survey was oriented toward ascertaining what role various factors played in their decisions to become physics teacher candidates. Major factors influencing the decisions of students to become physics teachers included good experiences with qualified physics teachers, and a desire to make a difference in the lives of other people.

In-service Teachers: The in-service teacher survey dealt with both direct and indirect teacher candidate recruitment practices, and with factors that would influence a teacher's decision to leave the teaching profession. There were several interesting findings related to the "joys" of teaching including factors very similar to those expressed by teacher candidates. The greatest challenges to remaining in the teaching profession included such things as poor attitudes and behaviors of students, and lack of support and respect from students, parents, or administrators.

Key Findings: Teacher Preparation Programs

The Committee members know very little about physics teacher preparation programs statewide in Illinois. From a 1995 survey completed by 8 of 22 physics teacher education program directors, it was clear that most institutions are not strongly engaged in teacher preparation. Based on projections, the mean graduation rate for PTE majors was only 0.69 students per institution per year. Fully one half of the institutions surveyed had no students in the physics teaching major. Several had not graduated a physics teacher education major in more than ten years. At least one program has expanded dramatically over the past ten years with more than 30 officially declared physics teaching majors in the pipeline. Alternative certification programs are beginning to have an impact.

Key Findings: In-service Teacher Retention

There are a number of reasons for teacher attrition identified through the in-service teacher survey. The reasons were identified as being in two different classes – those over which external agents have little control and can make little direct difference, and those that can be influenced. There was grave concern expressed by several of the Committee members for the current lack of support for crossover teachers, especially those in urban and rural settings. These teachers often work in solitude, and not infrequently in small schools serve as the "department of science" – teaching a wide variety of disciplines, often without appropriate preparation, curricular and instructional materials, demonstrations and laboratory equipment. Other concerns by Committee members spanned the view from induction and mentoring, to appropriate performance assessment and ongoing professional development, all of which are lacking in many urban and rural settings.

Recommendations: Teacher Candidate Recruitment

Based on the survey results of physics teacher education candidates, the following and similar recommendations for recruitment were made:

- Teachers should continue to *indirectly* recruit students through excellent science teaching
- Teachers should *directly* recruit their students to careers in science teaching

These recommendations are made for ALL science teachers at ALL levels, elementary school through university level. In addition, attitude changes are required among science teachers at all levels. That is, we must change our attitudes from “Those who can do, do; those who can’t, teach!” to “Those who can, teach!” We should avoid thinking that excellent students as “too good for teaching” and should think of teaching as a worthy goal for even the very best of students.

Not every student will make a viable teacher candidate. Successful teachers are often successful students with certain types of personality traits and work ethics. Prospective recruits should have personal abilities consistent with those of a good teacher. The abilities extend to scholarship, leadership, and character. A characterization of students who should be *directly* recruited to careers in science teaching was established, and includes such obvious traits as altruism, intelligence, interest, and leadership. It was recommended that a teacher candidate recruitment guide be prepared and disseminated with the assistance of the Illinois Science Teachers Association.

Recommendations: Teacher Candidate Preparation

This is without a doubt the most difficult area for which the Committee was to make recommendations. As noted earlier, the Committee has very little information about physics teacher preparation within the State of Illinois. Nonetheless, from what little is known about general trends, the Committee made a few tentative recommendations that include such things as establishing a committee to annually survey and report on physics teacher preparation programs throughout Illinois. Further, it was recommended that the Executive Council seriously consider becoming more politically active with regard to school certification law within the State.

Recommendations: In-service Teacher Retention

A list of retention-related recommendations was generated. It was noted that retention efforts should be focused primarily on mentoring in-service teachers working in urban/rural settings who have little professional support. Suggested were such things as establishing a communications network and providing support resources. It was recommended that ISAAPT work more effectively with other statewide science teacher associations in an effort to provide more physics-related offerings, and to use a variety of electronic and human networks to provide additional support.

The “Illinois Model”

The Committee both prepared and prioritized action items that can and should be initiated as completely and in as short a timeframe as possible. Due to the detailed and complex nature of these action items, their description has been restricted to the Committee’s Full Report. Which aspects of the suggested action plan will be followed will be determined entirely at the discretion of and with the support of the ISAAPT Executive Council.

Full Report

The Committee’s Full Report and special session PowerPoint presentations along with other background information may be found at the following Web address:

<http://www.phy.ilstu.edu/pipeline/>.

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Ad Hoc Committee on High School Physics Teacher Recruitment, Preparation, and Retention
Illinois Section of the American Association of Physics Teachers

Committee Members

The following individuals participated in the presentations and follow-up discussions that resulted in the above findings and recommendations. Committee leaders’ names appear in *italic lettering*; they were the members most responsible for the implementation of the special session.

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