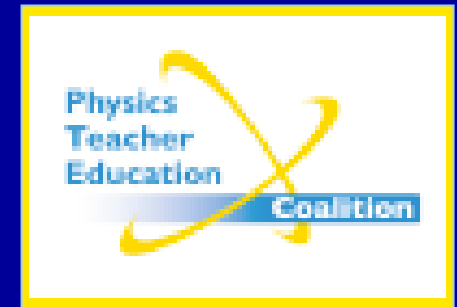


Physics Teacher Education Coalition (PhysTEC) at Ball State University



David Grosnick
David Ober
James Watson
Neil Anthony
Elaine Gwinn
Jeff Sayers
Mike Wolter

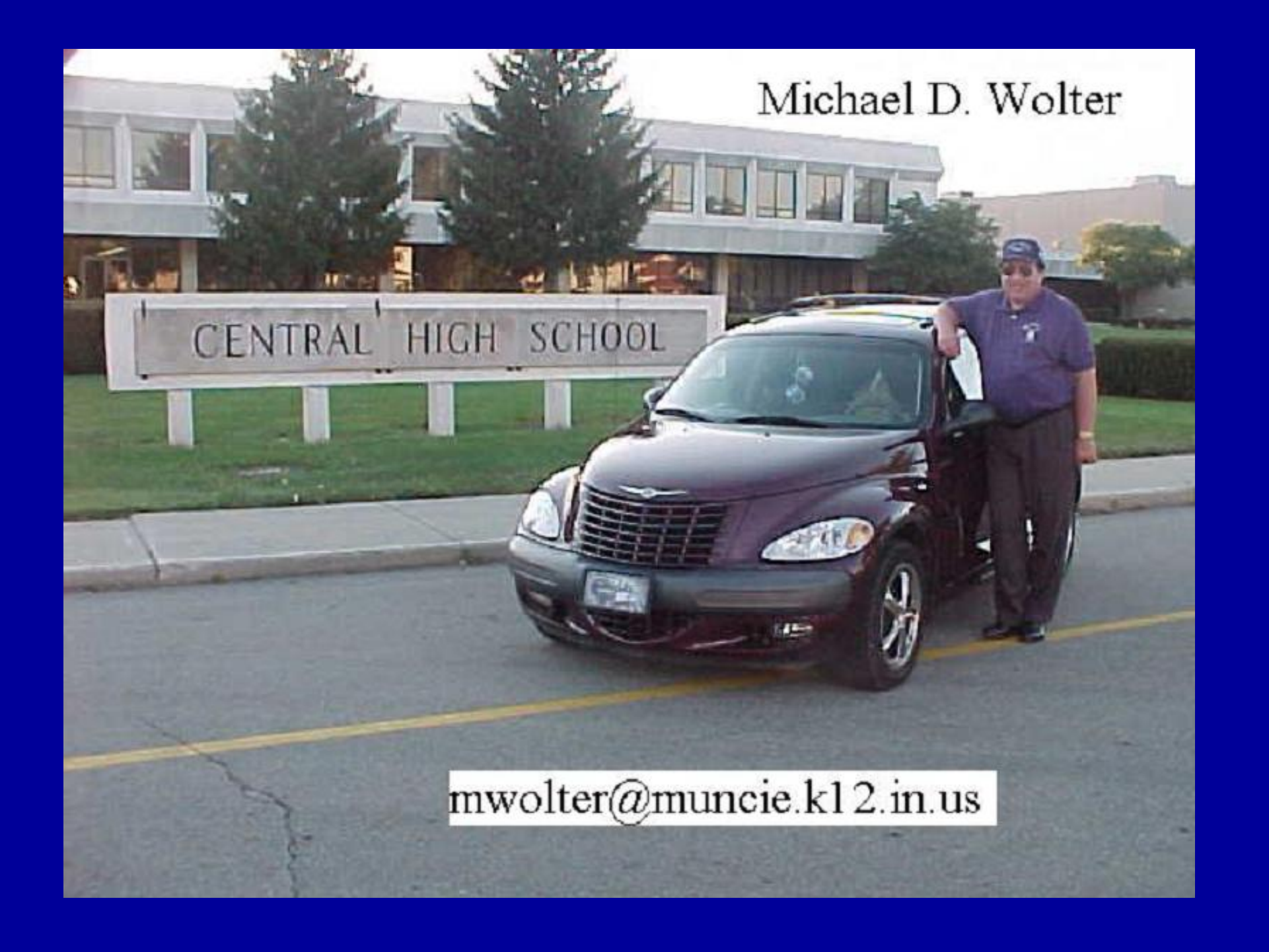


2001-2007



September 25, 2007

Michael D. Wolter

A photograph of Michael D. Wolter, a man in a purple polo shirt, dark trousers, a blue baseball cap, and sunglasses. He is standing next to a maroon Chrysler PT Cruiser with the driver's side door open. In the background is a large sign that reads "CENTRAL HIGH SCHOOL" in front of a school building with several windows and trees.

CENTRAL HIGH SCHOOL

mwolter@muncie.k12.in.us

Problem:

National Crisis in Physics and Physical Science Teacher Preparation

Future shortfall of physics teachers

Physics is listed as a field with a
“considerable shortage” of teachers

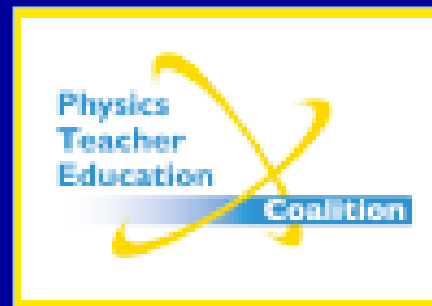
Educator Supply and Demand in the US Report,
2002 American Association of Employment in Education

VISION

A new generation of secondary and elementary school teachers will enable students to experience physics and physical science as an engaging and exciting activity.

This kind of instruction will encourage *all* students in the U.S. to take at least one year of physics while in high school.

What is PhysTEC?



Program to improve the science preparation of future K-12 teachers

Goal:

To produce **more** and **better-prepared** science teachers

www.phystec.org and www.ptec.org

PhysTEC was initiated by APS, in partnership with AAPT and AIP, in response to national reports calling for the improvement of K-12 science teaching

See for example:

Before It's Too Late, The Glenn Commission (2000)
<http://www.ed.gov/americaaccounts/glenn/>

Educating Teachers of Science, Mathematics, and Technology: New Practices for the New Millennium, National Academy of Sciences (2000)



Current PhysTEC Support

- ◆ National Science Foundation

Five-year, \$5.76M grant



- ◆ Fund for Improvement of Post Secondary Education (FIPSE)

Grant to enhance evaluation, induction, and dissemination

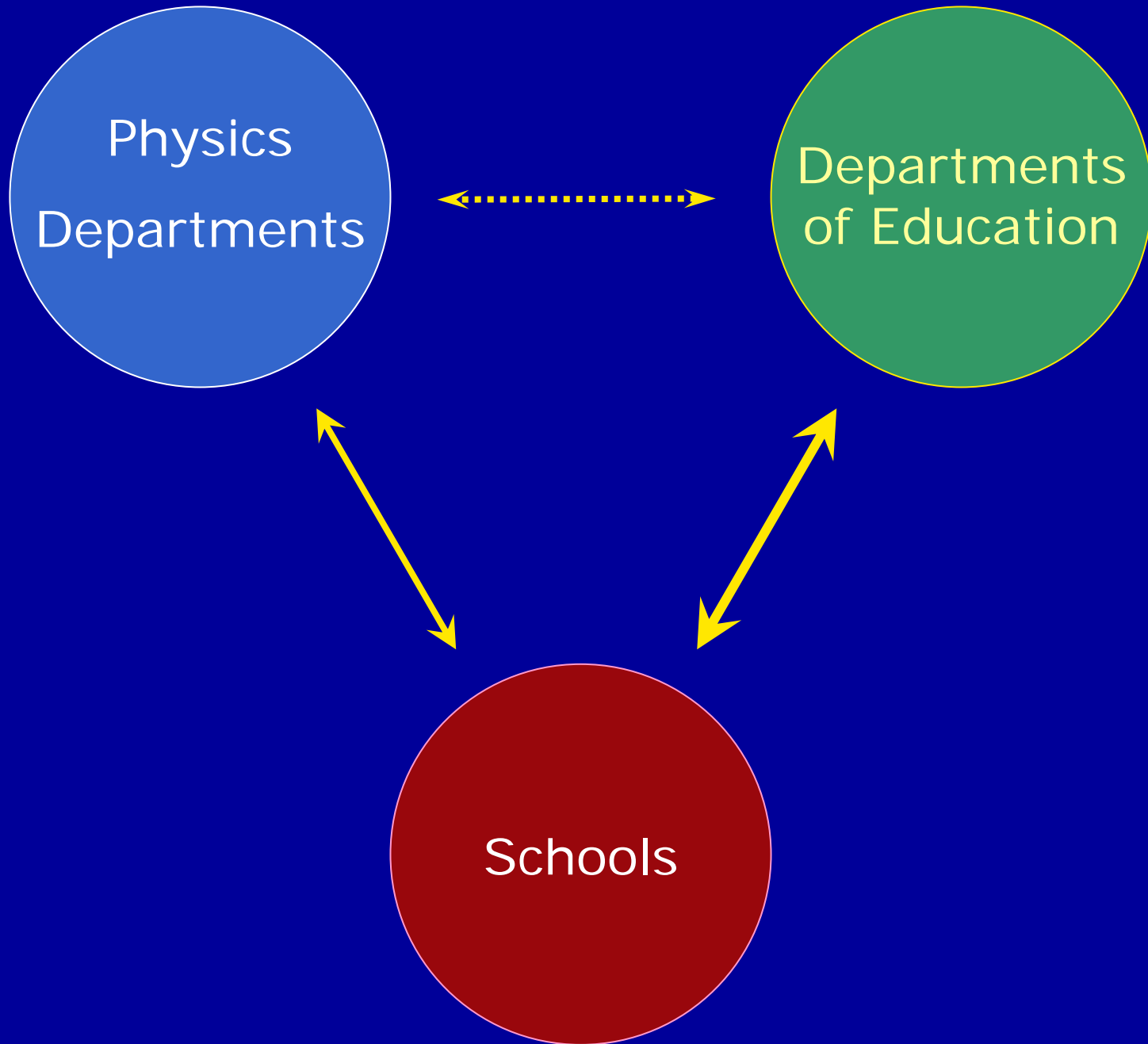


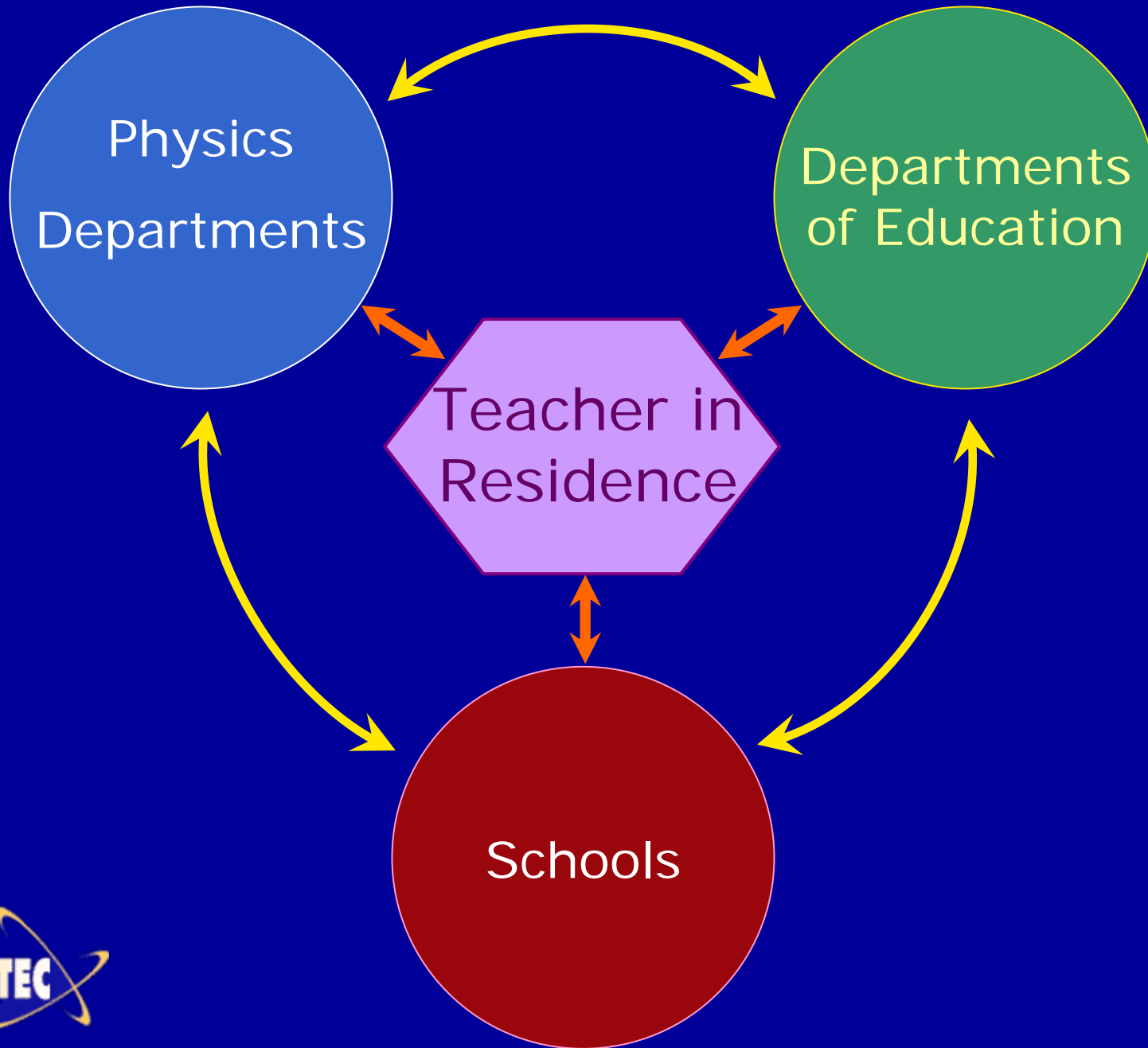
- ◆ APS raised funds for additional corporate-sponsored sites



PhysTEC Program Components

- Collaboration between Physics Departments, College of Education, and local schools
- Teacher-In-Residence (TIR) program
- Induction/Mentoring of science teachers
- Revision of physics and science methods courses based on Physics Education Research and active learning
- Involvement of physics faculty with pre-service and in-service science teachers





Teacher-In-Residence (TIR)

Who are they?

- Local K-12 master teacher
- Leaves school position for 1 year, then returns to classroom
- Full-time participant in Physics Department

What do they do?

- Assist faculty with physics and science education courses
- Mentor pre-service and in-service science teachers
- Recruit future science teachers



Mentoring pre-service teachers



Interactions with faculty



Recruitment of future teachers



Course revision

Mentor to New High School Teachers

- On-campus group workshops
- On-site classroom support
- Inquiry methods for addressing common physics misconceptions



Successful Retention

Since 1999-2007, 41 students from **Ball State University** have attained physics certifications

100% actively teaching



Ball State University Production of Teachers by First Year of Teaching with a Standard Certification in Physics from 1999-2007

	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	Ave/Yr
Bachelors	4	4	3	2	2	2	3	4	3.0
Post-Grads	2	0	3	4	2	1	2	3	2.1
Totals	6	4	6	6	4	3	5	7	5.1

Comments: This data varies from the Indiana DOE by time period covered, by first year of teaching versus year of certification, and by inclusion of two out-of-state teachers. In addition, five teachers, who were not in the DOE raw data, were discovered through the sources listed below and then verified by the DOE Teacher Inquiry website and/or by Internet searches and email contact.

Sources: Ball State University Advising Office, BSU student database, BSU Office of Educational Services, departmental advising reports, Indiana Department of Education Teacher Inquiry website, hard-copy class rosters, Internet searches, and email contacts.

Are pre-service teachers better qualified?

- In IN, pre-service teachers are evaluated on nationally-based INTASC principles

INTASC = Interstate **N**ew **T**eacher **A**ssessment
and **S**upport **C**onsortium

Evaluated on 10 principles

(e.g. pedagogy, methods, child development, etc.)

- Take **PRAXIS** exams (content-based)
- rGrade – electronic portfolio evaluation
- **R**eformed **T**eaching **O**bservation **P**rotocol

Field-Based Experiences

Intro to Secondary Science Teaching

- Freshman introductory science ed. course

TIR connects depts. and science educators

Early Education Field Experience

- Pre-student teaching participation

Student Teaching



The Team:

Science Education

M. Mitchell

M. Walker

S. DeSouza

Teacher Advisory Group

J. Powell G. Ring

C. Payne Area Teachers

J. Miller IN DOE

Physics Dept.

D. Ober

J. Watson

D. Grosnick

Teachers-in-Residence

M. Wolter

G. Hill

J. Sayers

J. Bogan

N. Anthony

E. Gwinn

Summary



- ◆ National crisis: shortfall of qualified physics teachers *recruitment and retention*
- ◆ Cooperative effort between depts. of physics and education, and schools
 work as a team to promote physics teaching
- ◆ Teacher-in-Residence integral part of recruitment and retention of teachers
 mentoring pre-service and in-service teachers
- ◆ Improve quality of pre-service teachers
 INTASC and RTOP assessment

Ball State University Team Approach