Case Study Findings of PHOTON problem based learning (PBL) with Photonics Outreach Programs

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Photonics Program Origin

• 1992 Imhotep Academy, College of Physical and Mathematical Sciences of North Carolina State University

• 2004-06 Burroughs Wellcome Fund Photonics Xplorers Program

• 2005 National Science Foundation, ITEST Photonics Leaders Program

• 2008 NSF ITEST Teacher and Student $1.2 million
Who do we serve?

High School Students Demographic Data (N=95)
- 74%
- 13%
- 12%
- 1%

Middle and High School Teachers Demographic Data (N=19)
- 63%
- 32%
- 5%
Case Study Purpose

To integrate the PHOTON PBL curriculum resources into the Photonics program and determine its utility with students and teachers.
PBL Implementation Efforts

Fall 2008 - Photonics Staff training of PHOTON resources
Hiking 911 with 25 ninth graders

Spring 2009 - Shining Light on Infant Jaundice PBL module
Virtual PBL session with 19 teachers

Summer 2009 - Watt’s My Light delivery with 40 students
Hiking 911 with 30 students
PBL Lessons Learned

- Staff professional development is beneficial
- Additional teacher guidance towards photonics content
- More time for research, solution testing and conceptual development
- Incorporation of professionals
- Integration hands-on activities
- Development of research, problem solving, collaborative skills and knowledge
Summary

• Increase time devoted to research, testing and conceptual development
• Infuse hands-on activities to emulate problems
• Train teachers through research and synthesis to provide scientific and mathematics content to facilitate the PBL process
• Allow teacher creativity that integrate photonics connections and applications
THANK YOU!