IEEE SYMPOSIUM ON PRE-UNIVERSITY TEACHER TRAINING

The History of IEEE's Teacher In-Service Program

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The History of TISP

- Agenda
  - How do I fit into the TISP story?
  - Why TISP?
  - How TISP started
  - What is the current status of TISP?
  - How have TISP training workshops evolved?
  - What's next?
  - A challenge or two

# How Did I Fit Into the TISP Story?

- Spent 26 years as a high school educator, 12 as a principal
- Understand the professional development needs of teachers
- Began working for IEEE in July 2000 while living in Bradenton, Florida
- Made a commitment to work with the local Section (FWCS)
- Identified a professional development gap for teachers that engineers could fill

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Why TISP?

- Pre-university educators have not had sufficient exposure to engineering, computing or technology concepts

- Who is in a better position than engineers to provide professional development for local pre-university teachers in science, technology, engineering and mathematics?

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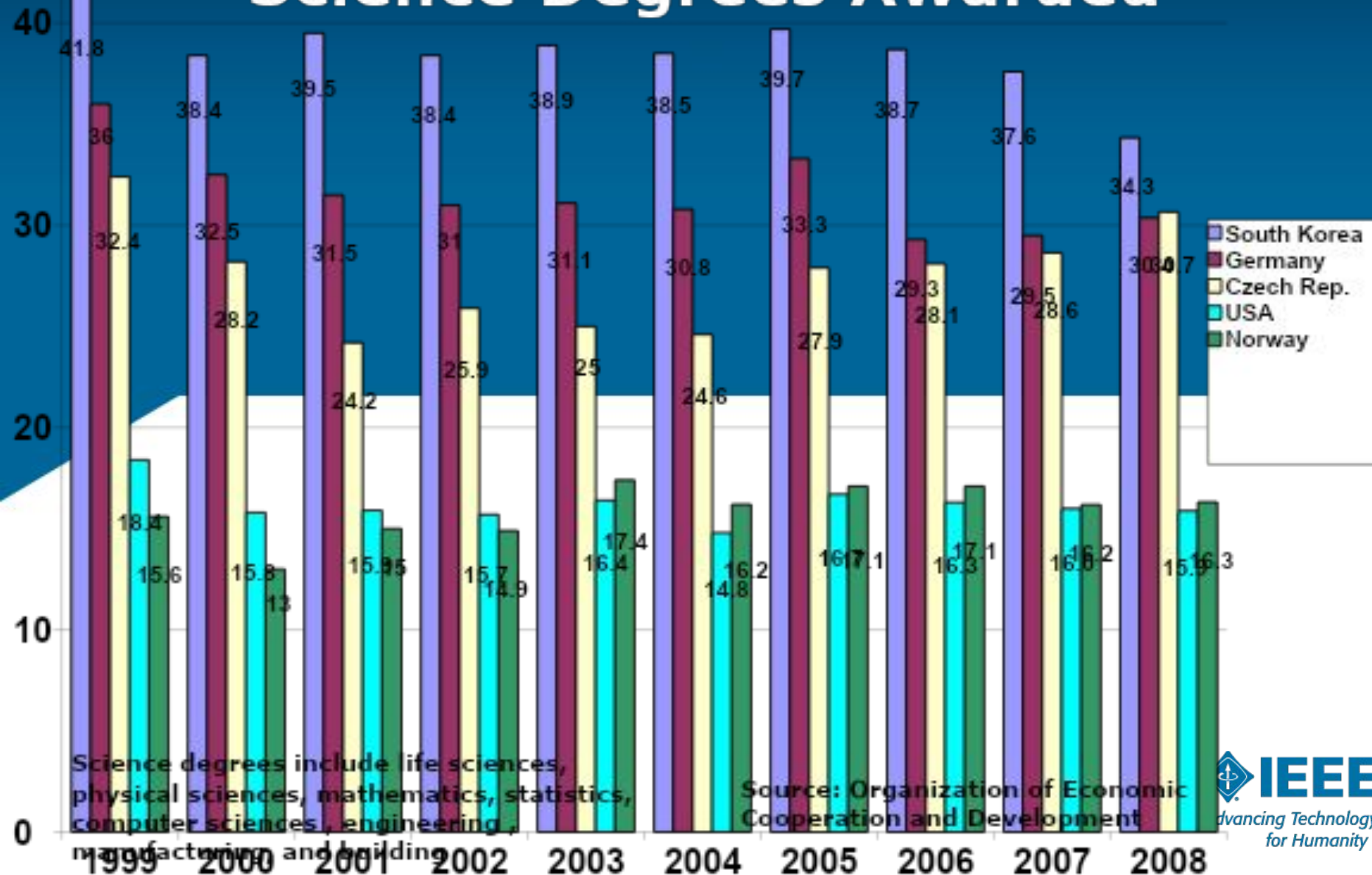
Overall TISP Goals

- Empower IEEE "champions" to develop collaborations with local pre-university education community to promote applied learning
- Enhance the level of technological literacy of pre-university educators
- Increase the general level of technological literacy of pre-university students
- Increase the level of understanding of the needs of educators among the engineering community
- Identify ways that engineers can assist schools and school systems

How TISP Started

- After <u>several</u> IEEE Florida West Coast Section ExCom meetings to convince, promote, recruit, recruit and recruit a volunteer to lead the first presentation,

- then……

...John Luce raised his hand!

How TISP Started

- The first TISP session was held on 19 February 2001 at the University of South Florida (Build a working model of a nail clipper)
- 35 teachers attended
- 4 IEEE volunteers participated
  - John Luce
  - Jules Joslow
  - Quang Tang
  - Bob Ashley
- And TV coverage!

How TISP Started

- On 2 March 2001, the second TISP session was held ("How the Lights Stay On"), led by John Twitchell

- In July 2001, the first TISP training workshop was held

  - One-day training session

  - 9 participants

  - Canada(1), South Africa(1) US(7)

Where is TISP Now?

- Between 2001-2004, TISP training workshops were small in size due to resource constraints
  - 2-3 training workshops were held
  - @20 participants in total

- In 2005, things changed….

Moshe Kam Become VP of EA

Where is TISP Now?

- Resulting in Volunteer training workshops conducted on a larger scale:
  - Region-wide
  - Large Section
  - Multiple Sections

- The IEEE New Initiative Committee and the IEEE Foundation provided seed funding

Training Workshops: 2005-Present

25 Workshops - 2203 Participants

Region 1-6 - USA

Boston, Massachusetts

Baltimore, Maryland

Pittsburgh, Pennsylvania

Atlanta, Georgia (2)

Indianapolis, Indiana

Dallas, Texas

Manhattan Beach, California

San Francisco, California

Region 7 - Canada

Montreal, Quebec

Mississauga, Ontario

Region 8 – Europe, Middle East, Africa

Cape Town, South Africa

Lusaka, Zambia

Porto, Portugal

Stirling, Scotland

Al Khobar, Saudi Arabia

Region 9 – Latin America

Rio de Janeiro, Brazil

Piura, Peru

Cordoba, Argentina

Guayaquil, Ecuador

Port of Spain, Trinidad

Montevideo, Uruguay

Region 10 – Asia & Pacific

Kuala Lumpur, Malaysia

Shenzhen, China

Hyderabad, India

www.ieee.org/education_careers/education/preuniversity/tispt/tispworkshops.html

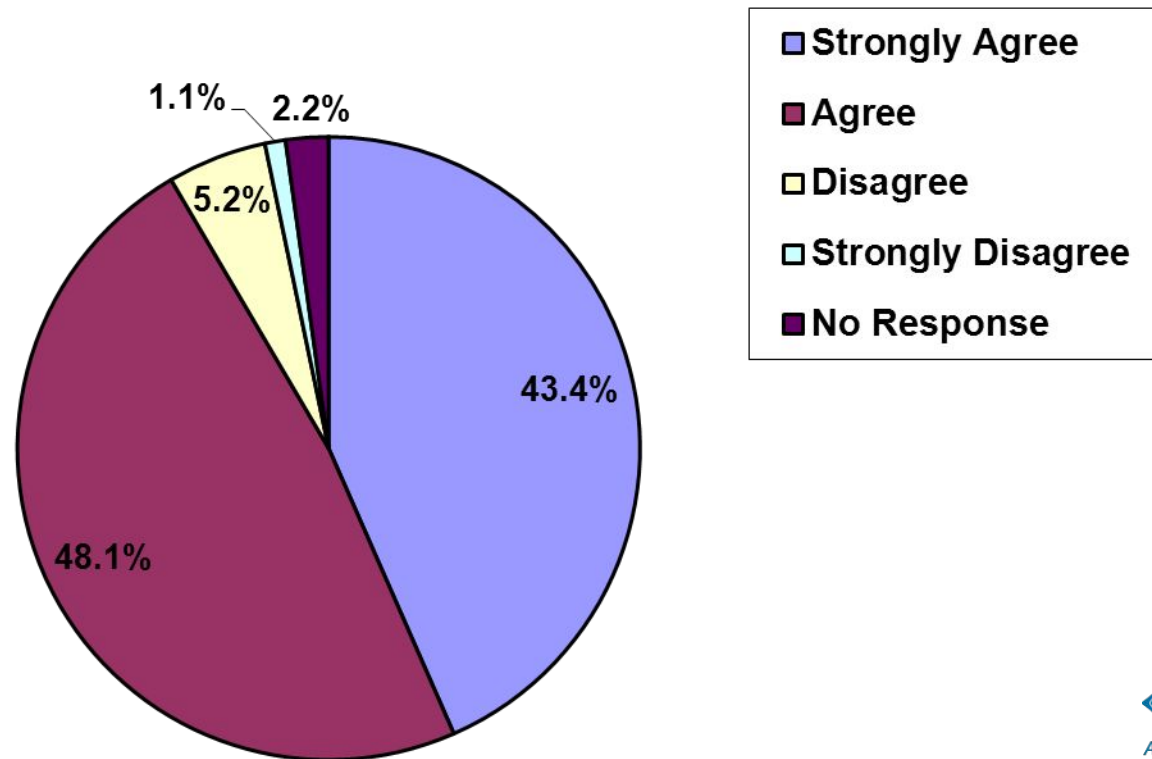# **Teacher In-Service Program Presentations**

- Over **168** TISP presentations have been reported by IEEE volunteers

- TISP presentations have reached **over 4100** pre-university educators
  - This reach represents more than **445,000 students each year**

# TISP Presentations by Volunteers Teacher Survey Results

"This presentation has increased my level of technological literacy"

Legend:
- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Response

Strongly Agree: 43.4%
Agree: 48.1%
Disagree: 5.2%
Strongly Disagree: 1.1%
No Response: 2.2%

TISP Presentations by Volunteers Teacher Survey Results

**"I will use the concepts presented in my classroom instruction"**
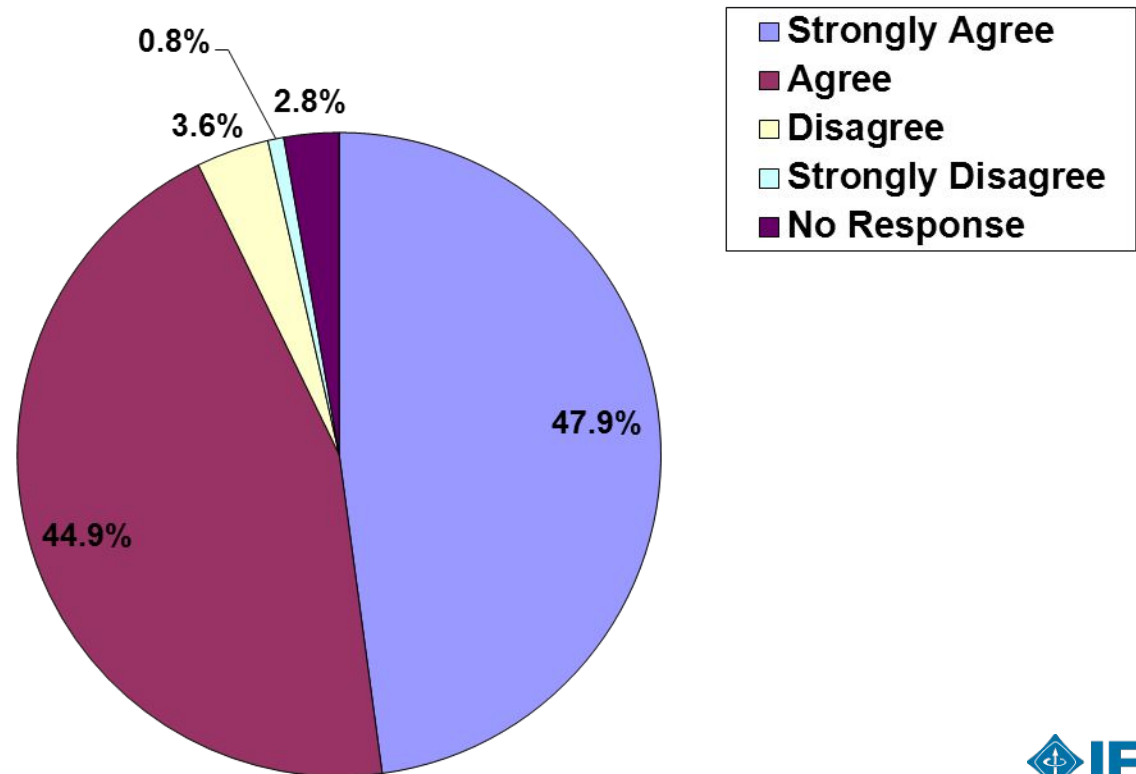
38 countries, 2000+ volunteers

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How Have TISP Training Workshops Evolved?

"The Traditional Approach"

- Train Volunteers
  - IEEE Section Members
  - Teachers and Instructors
- …using approved lesson plans on engineering and engineering design
- IEEE members will develop and conduct TISP training sessions with Teachers
- Teachers include these concepts when teaching their Students

IEEE Volunteers

Teachers

Students

IEEE

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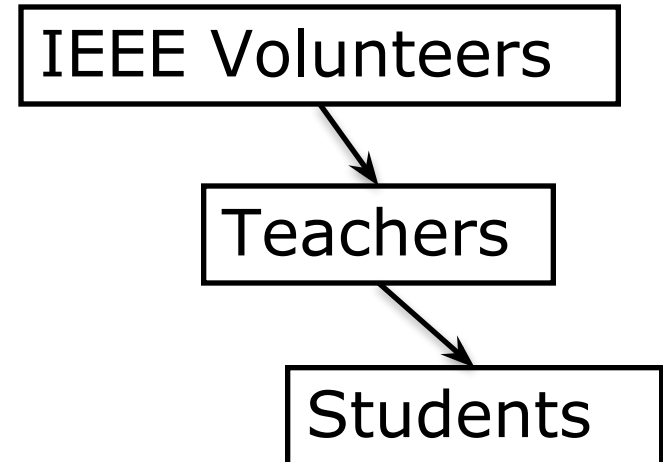
VARIANTS ON THE ORIGINAL MODEL

Composition of Participants

Traditional

Participants:

70% HGM volunteers
5% student branch leaders
10% teachers
5% administrators
10% staff and instructors

Peru, Ecuador

Participants:

5% HGM volunteers
70% student branch members and/or leaders
10% teachers
5% administrators
10% staff and instructors

Uruguay

Participants:

5% HGM volunteers
5% student branch leaders
75% teachers
5% administrators
10% staff and instructors

Southern China

Participants:

40% HGM volunteers
0% student branch leaders
25% teachers
25% administrators
10% staff and instructors

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EAB works with local volunteer organizing committee on a TISP event.

Traditional

↓

A 1½ day event is held:
(1) Background on IEEE and on local pre-university conditions
(2) Hands-on experiments (lesson plans)
(3) Alignment with educational standards
(4) Working with the local school system
(5) Working with EAB/EAD

↓

Volunteers organize TISP teams

↓

Volunteers conduct TISP sessions to pre-university teachers

↓

Teachers use IEEE lesson plans in the classroom

It works!

EAB *and sometimes a Regional Task Force* works with local volunteer organizing committee (student members and leaders) on a TISP event.

A 1½ day event is held:
(1) Background on IEEE [and on local pre-university conditions]
(2) Hands-on experiments (lesson plans)
(3) ~~Alignment with educational standards~~
(4) Working with the local school system
(5) Working with EAB/EAD

Volunteers *and Regional Task Force* organize TISP teams

Volunteers *aided by Regional Task Force* conduct TISP sessions to pre-university teachers

Teachers use IEEE lesson plans in the classroom

It works!

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The First Student Branch TISP Training Workshop Held in Piura, Peru, August 2007
(105 attendees)

Guayaquil, Ecuador
10-11 November 2009

- A training session for <u>student branch leaders</u>

- Based on the success of the student branch session in Piura, Peru in 2007

- A new TISP model

- 140 attendees

EAB works with local volunteer organizing committee on a TISP event for teachers.

A 1½ day event is held:
(1) [Background on IEEE] and on local pre-university conditions
(2) Hands-on experiments (lesson plans)
(3) ~~Alignment with educational standards~~
(4) ~~Working with the local school system~~
(5) Working with ~~EAB/EAD~~ *the local IEEE Section*

Volunteers organize TISP teams

Volunteers ~~conduct~~ *coordinate* TISP sessions ~~to~~ *with* pre-university teachers

Teachers use IEEE lesson plans in the classroom

We do not yet know if it works

EAB works with local volunteer organizing committee and *governmental/quasi-governmental organizations* on a TISP event.

Southern China

A 1½ day event is held:
(1) Background on IEEE [and on local pre-university conditions]
(2) [Hands-on experiments (lesson plans)]
(3) Alignment with educational standards (??)
(4) <u>Working with the local school system</u>
(5) Working with EAB/EAD

Volunteers *and government representatives* organize TISP teams

Volunteers conduct TISP sessions to pre-university teachers

Teachers use IEEE lesson plans in the classroom

We do not yet know if it works

EAB works with a local volunteer organizing committee, the Ministry of Education and industry on a TISP event for volunteers and teachers.

Saudi Arabia

A 1½ day event is held:
(1) Background on IEEE [and on local pre-university conditions]
(2) [Hands-on experiments (lesson plans)]
(3) Alignment with educational standards
(4) <u>Working with the local school system</u>
(5) Working with EAB/EAD

Volunteers *and government representatives* organize TISP teams

Volunteers conduct TISP sessions to pre-university teachers

Teachers use IEEE lesson plans in the classroom

It works!

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TISP Training Workshop
in Saudi Arabia (April 2011)
IEEE Volunteers and Teachers
200+ Attendees

55% Teachers and Ministry of Education
40% Volunteers and Industry
5% instructors and professional staff

What's Next? – Short Term 2012 Training Workshops

- R8 Student Branch Congress - Spain

- R10 Australia

- R9 Student Congress of Central America and Panama (CONESCAPAN) - Honduras

What's Next? – Long Term

- An active Teacher In-Service Program in all IEEE Sections

- Assess the effectiveness of TISP in helping teachers teach, and their students learn, science, technology, engineering and mathematics concepts

- IEEE volunteers involved in small and large scale curriculum revision

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Challenge #1

- Generate additional lesson topics/activities that demonstrate engineering, computing and technology concepts

Challenge #2

- Expand the reach of TISP to additional Sections and across Regions by serving as ambassadors

Thank you!

...for your contributions in improving the teaching and learning of pre-university teachers and their students in science, technology, engineering and mathematics through the Teacher In-Service Program.

Thank you for your kind attention