

National Girls Collaborative Project

The National Girls Collaborative Project (NGCP) brings together organizations that are committed to informing and encouraging girls to pursue careers in science, technology, engineering, and mathematics (STEM).

www.ngcproject.org

Regional Collaboratives

California www.ngcproject.org/california

Florida www.ngcproject.org/florida

North Carolina www.ngcproject.org/northcarolina

Northwest www.ngcproject.org/northwest

Collaborative Project



Project Goals

1. Maximize access to shared resources within projects and with public and private sector organizations and institutions interested in expanding girls' participation in STEM.
2. Strengthen capacity of existing and evolving projects by sharing promising practice research and program models, outcomes and products.
3. Use the leverage of a network or collaboration of individual girl-serving STEM programs to create the tipping point for gender equity in STEM.



Collaborative Project



Strengthening Capacity

The NGCP will disseminate Research Based Strategies to strengthen the capacity of girl-serving organizations to provide high-quality informal learning environments for girls in STEM and to effectively evaluate and assess their efforts.

Our partners

- Education Development Center (EDC)
- Assessing Women and Men in Engineering (AWE)

Our methods

- Webcasts
- Collaborative events
- Resource collection on NGCP website



... developing exportable assessment instruments and models for Engineering Pre-College and Retention activities

Good Assessment = Success: *Developing Assessment Based Outreach*

**NGCP Webcast
12 September
2007**

Barbara Bogue, M. Sc.
Assoc. Professor Engineering Science &
Mechanics and Women in Engineering
Penn State University

Rose Marra, Ph.D.
Assoc. Professor, Learning Technologies
University of Missouri-Columbia

Introducing ... Barbara Bogue

- PI, NSF AWE-PSU & SWE-AWE; Co-PI, AWISE.
- Associate Professor of Engineering Science & Mechanics & Women in Engineering, Penn State.
- Formerly director of Penn State Women in Engineering Program



Introducing ... Rose Marra

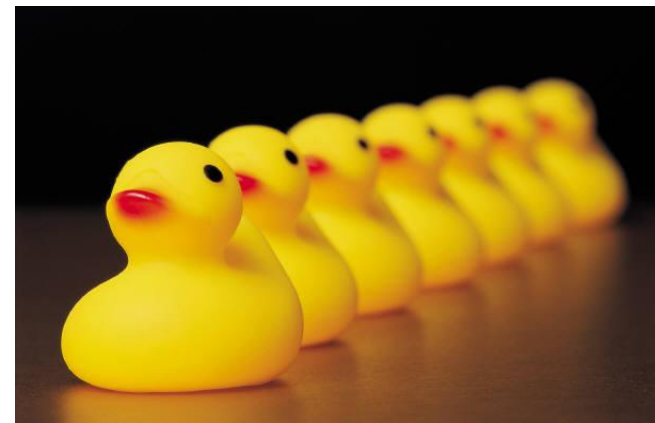


- PI of NSF AWE & AWISE.
- Associate Professor of Learning Technologies, University of Missouri.
- Formerly director of Engineering Instructional Services, PSU and software engineering, AT&T Bell Laboratories.

Good Assessment=Success

Agenda

- Why Assess?
- Using Assessment as Tool for Planning & Implementing Assessment/Evaluation
- Using Results
- Assess with Limited Resources
- Access AWE resources.



A Case: They Designed a Better Program through Assessment

- Recruiting girls to engineering
 - Residential → Day Camp
 - Resource Intensive → Lean



Results: Apparently Successful – But Maybe Not?

Pre and Immediate Post Survey Results

- Introduce girls to engineering career
 - Pre: 40/42 no interest in engineering
 - Post: 42/42 indicate interest in pursuing engineering as career
- Recruit girls
 - 13/15 seniors *plan* to apply to Penn State
- Provide leadership opportunities
 - 6/6 leaders give experience high marks (immediately and 6 mo. Post)



But Maybe Not...

Other Metrics: Resource Investment

Longer term tracking

- Recruit girls
 - 2/15 seniors apply
- Retain currently enrolled women
 - Tracking indicates all leaders are retained

Costly

- ~\$1500/girl
- Staff and leadership in full use for week; worn out
- Cost/recruitment yield=full tuition instate scholarship for one year!

Ratio of leaders/presenters to participants low

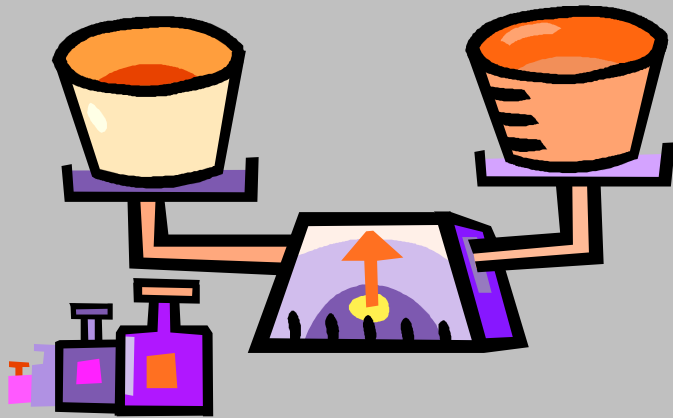
- Few upper-level women got leadership experience

Time

- Over 50% of time spent eating and sleeping!
- Only 10% on actual engineering activities!

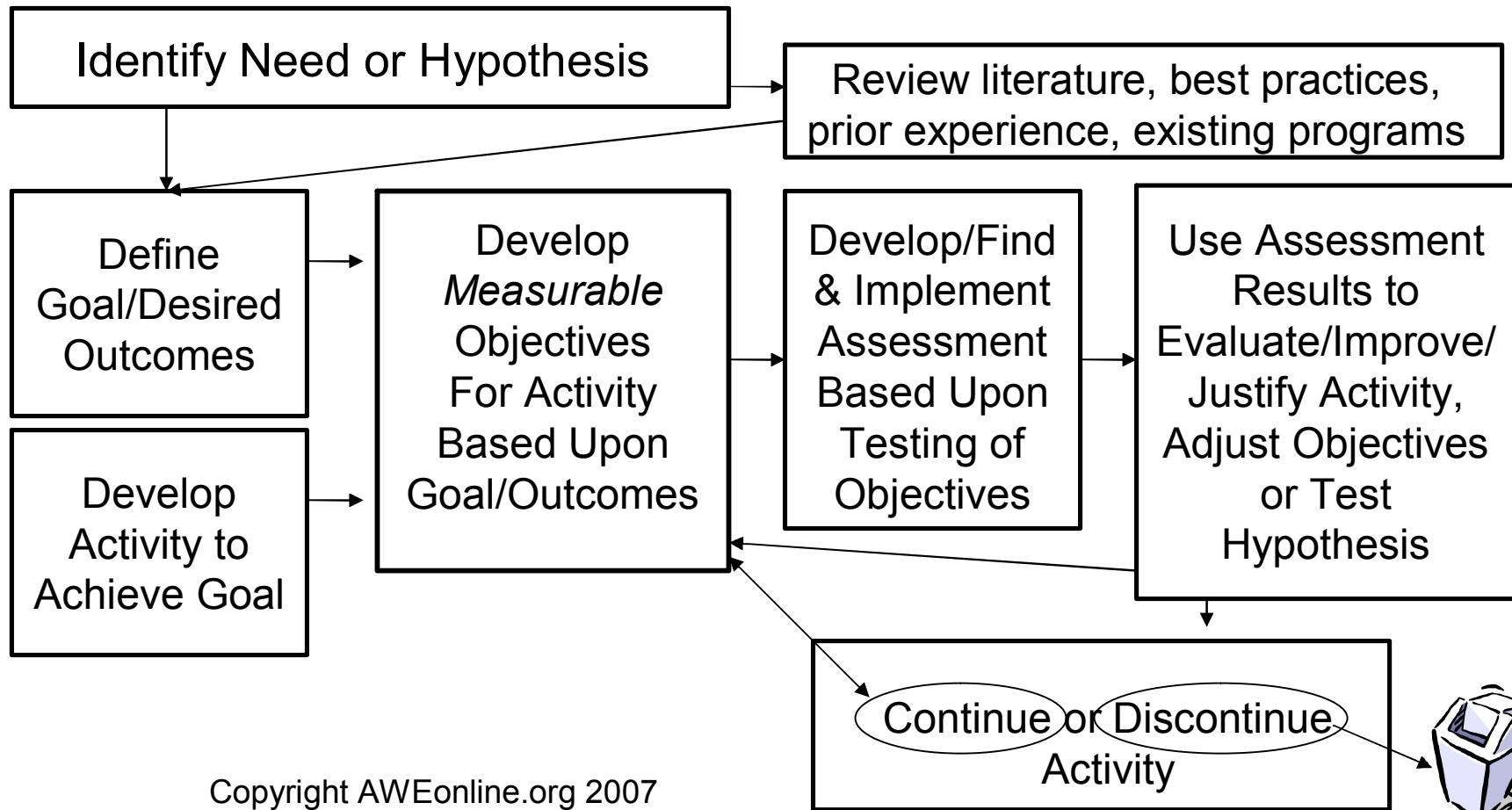


What is Assessment?

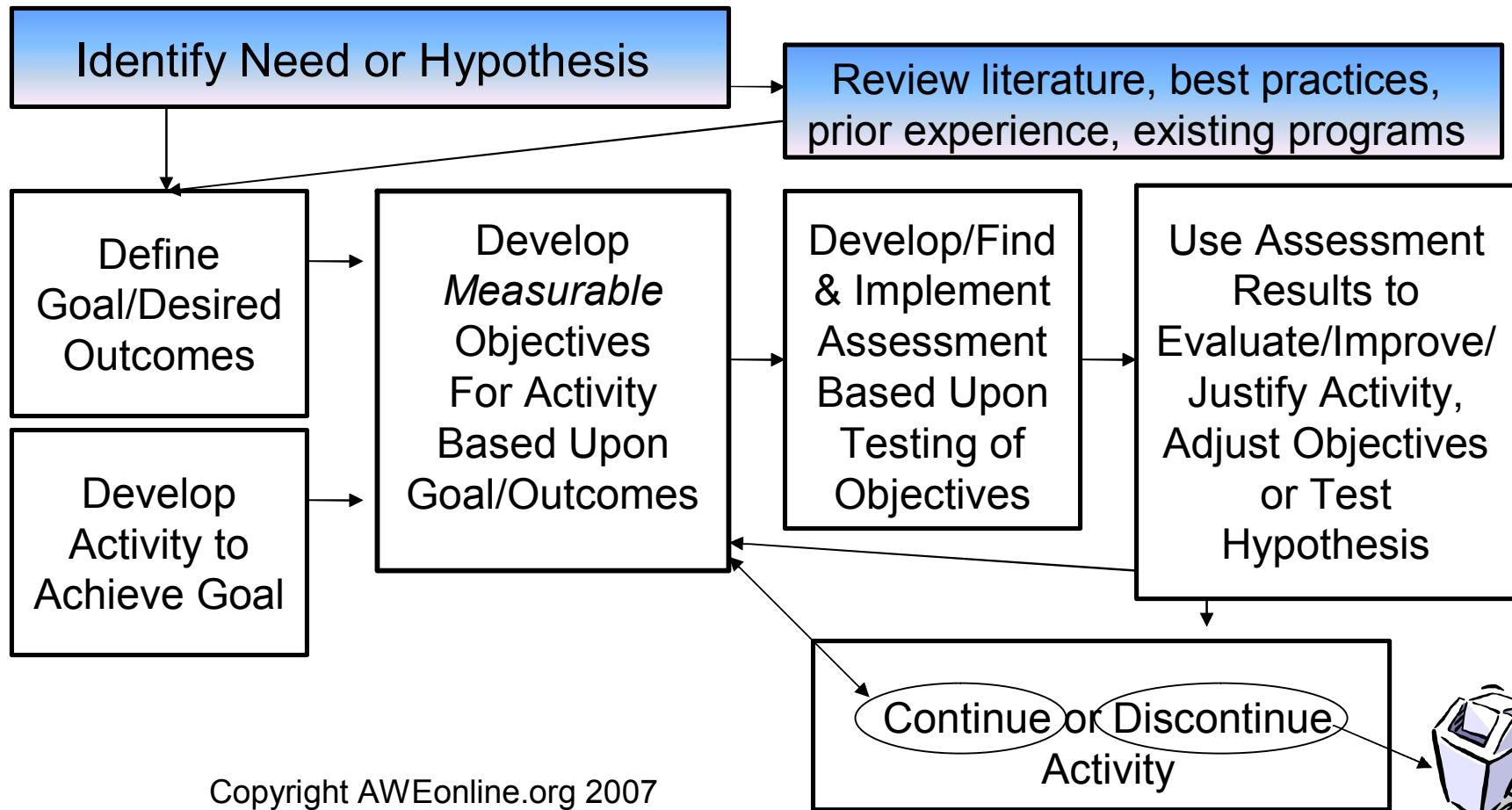


And why do it?

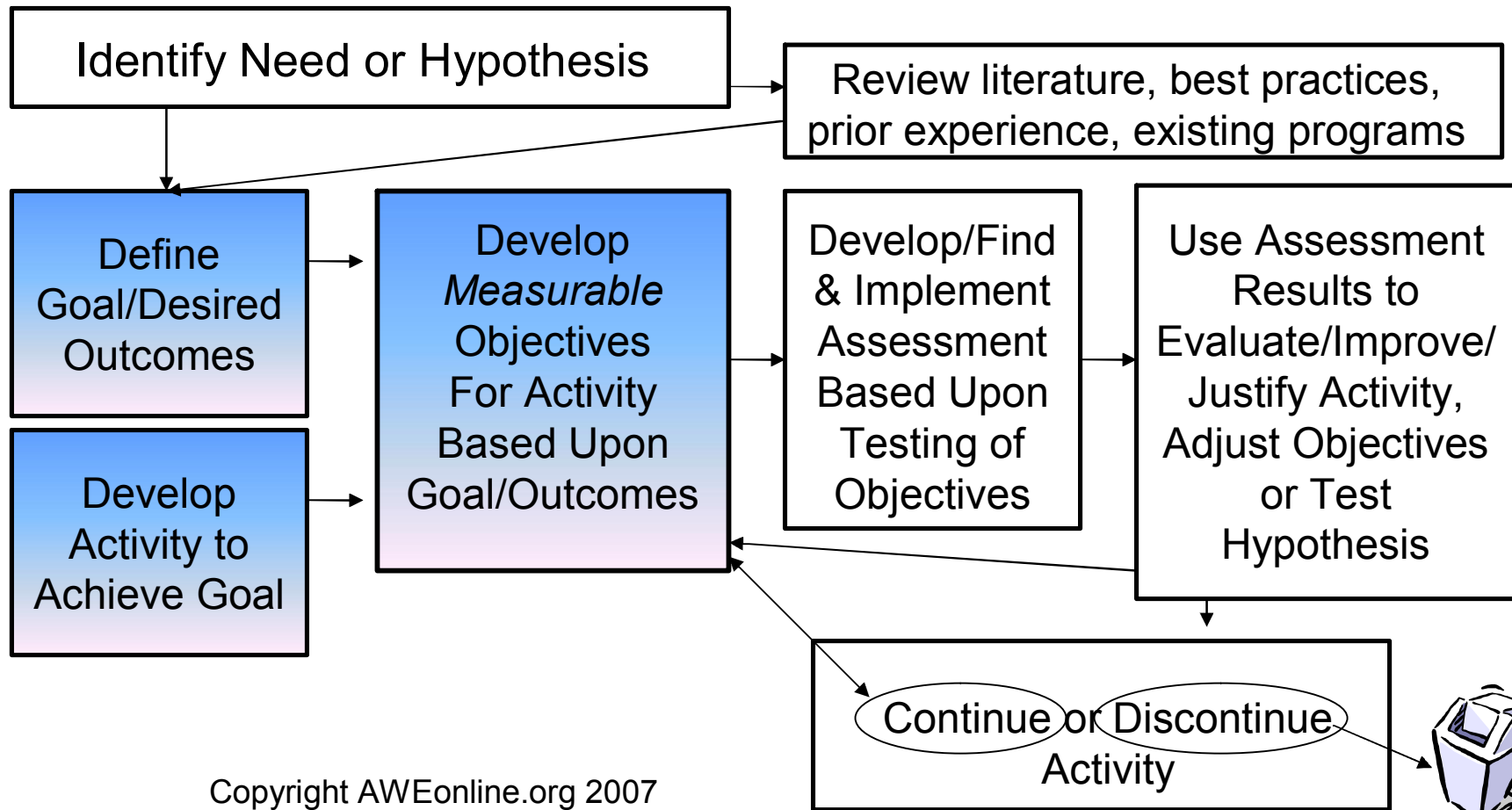
Getting Started: Assessment-Based Program/Activity Development



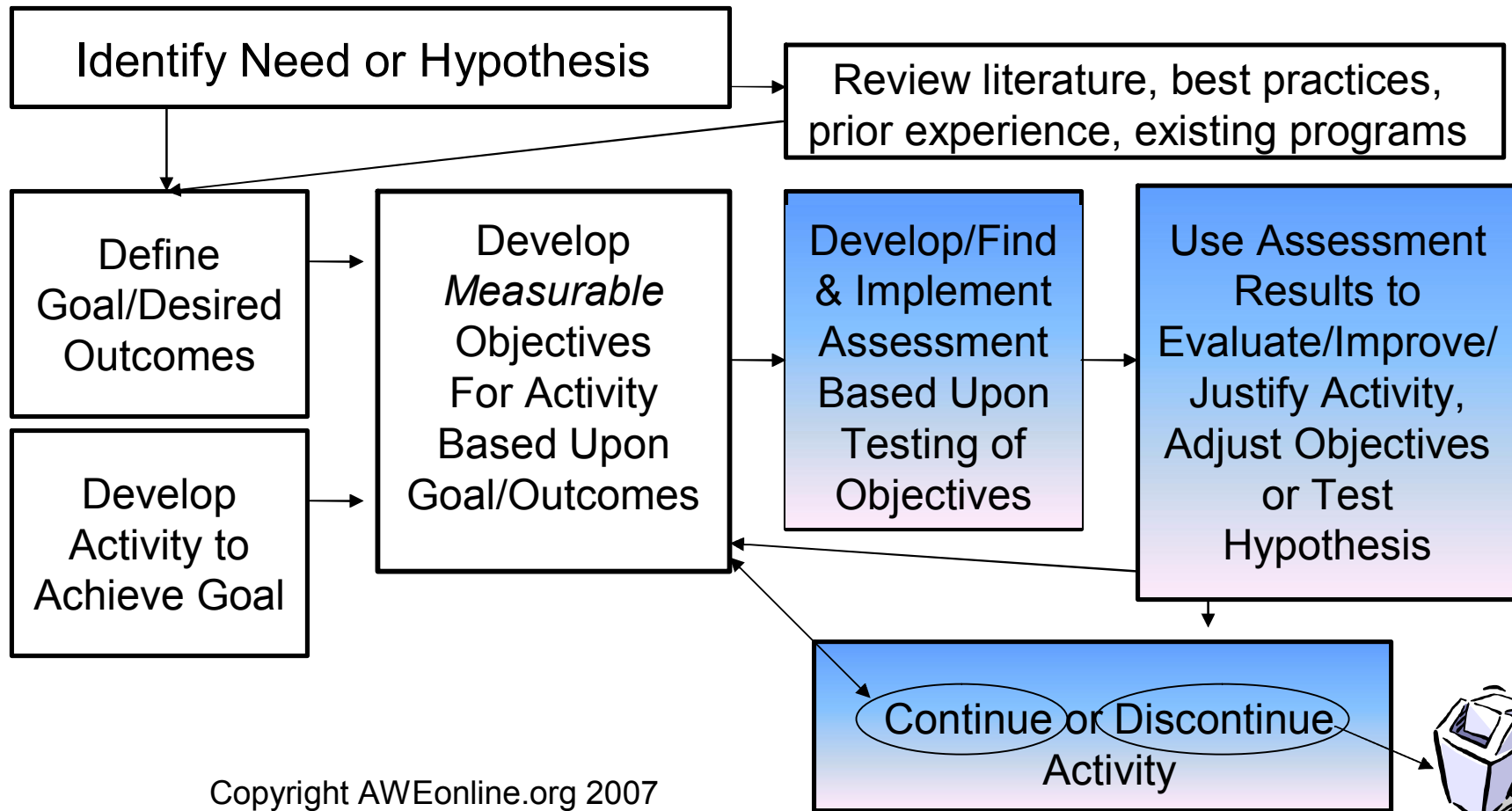
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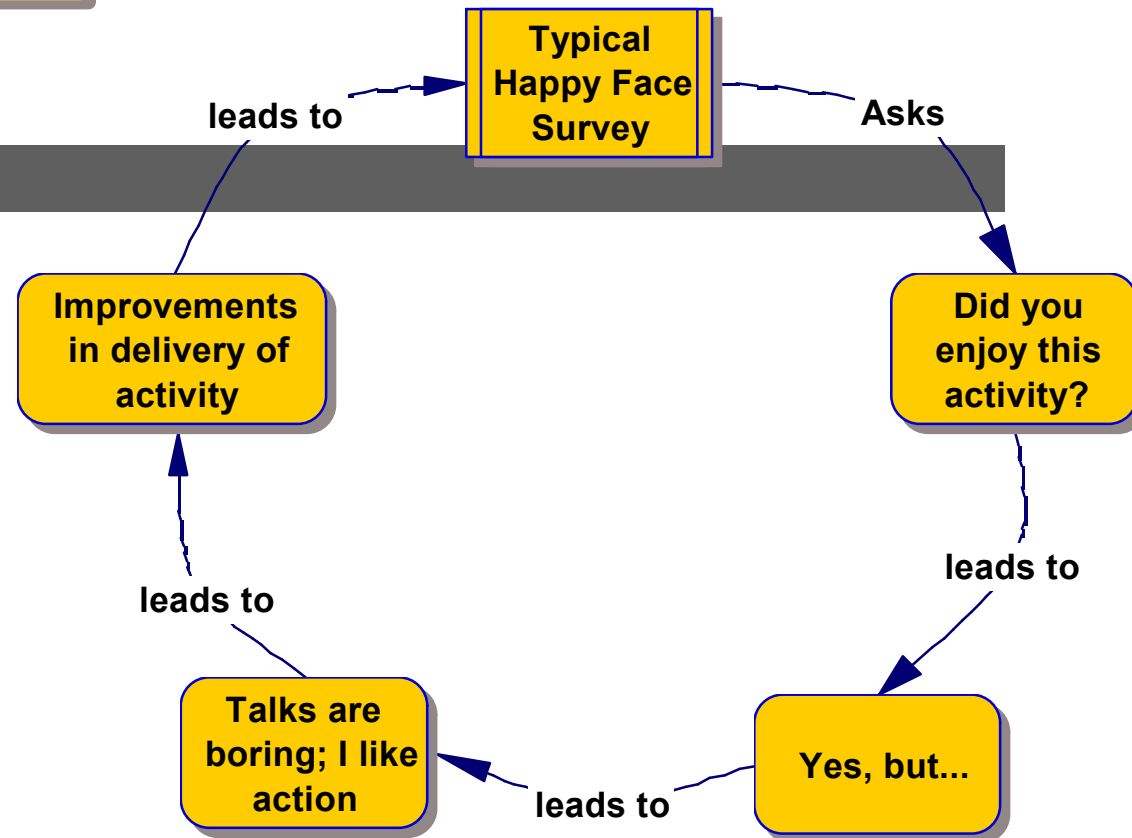
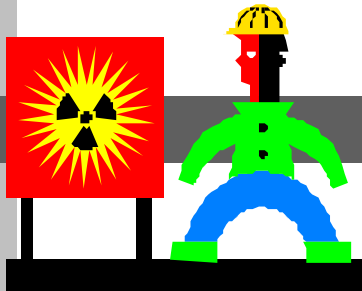


Getting Started: Assessment-Based Program/Activity Development



Portrait of Poor (but typical) Assessment

**Danger: Closed
Feedback Loop**



MIA:
Information on whether objectives of activity have been met

Types of Assessment Data

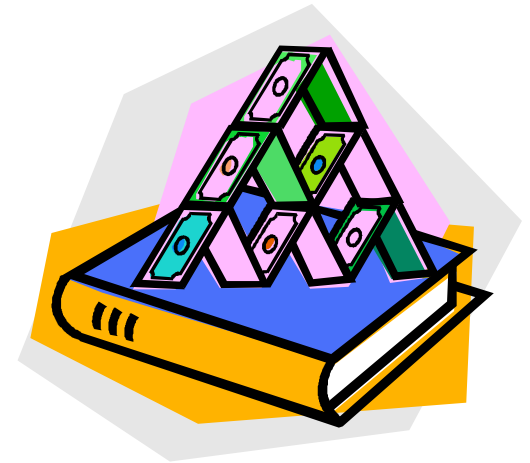


- Emphasis on quantitative assessment
 - Quant. methods can be resource smart
 - Easier to handle, report data for small teams
 - Allows both fast and complex analysis as well
 - Questions raised can be pursued with qualitative methods such as focus groups
 - Qualitative assessment is very effective, but quite resource intensive
- Summative and Formative assessment
 - Important to use both in instruments
 - Summative: Big picture questions, overall impact
 - Formative: Easily understood results that feed into continuous improvement of activity

Define Goals and Objectives

– Foundation of Outreach Activities

- Goals define our **broad** aim for the activity.
- Objectives support the goal and operationalize
 - Inform planning
 - Lead to measurable outcomes.



Goal: Recruit more women into engineering.

Goals and Objectives

– Why do they matter?

- Planning Tool
 - ID what we want to know before we design/implement activity
- Focus activity planning on the participant
- Maintain focus on desired outcomes during implementation
 - Ask: Does it address the objectives?
- Focus the assessment
 - On measuring the stated objectives



Good Objectives . . .

- Align with and support goal
- Specify outcome measures
- Recruitment camp example objectives
 - Promote interest in engineering for girls who have not expressed / shown this interest
 - As measured by pre- and post- survey responses
 - Recruit girls to engineering at Penn State
 - As measured by survey and admissions data
 - Provide leadership training and retain upper-level engineering student women
 - As measured by survey and tracking for retention

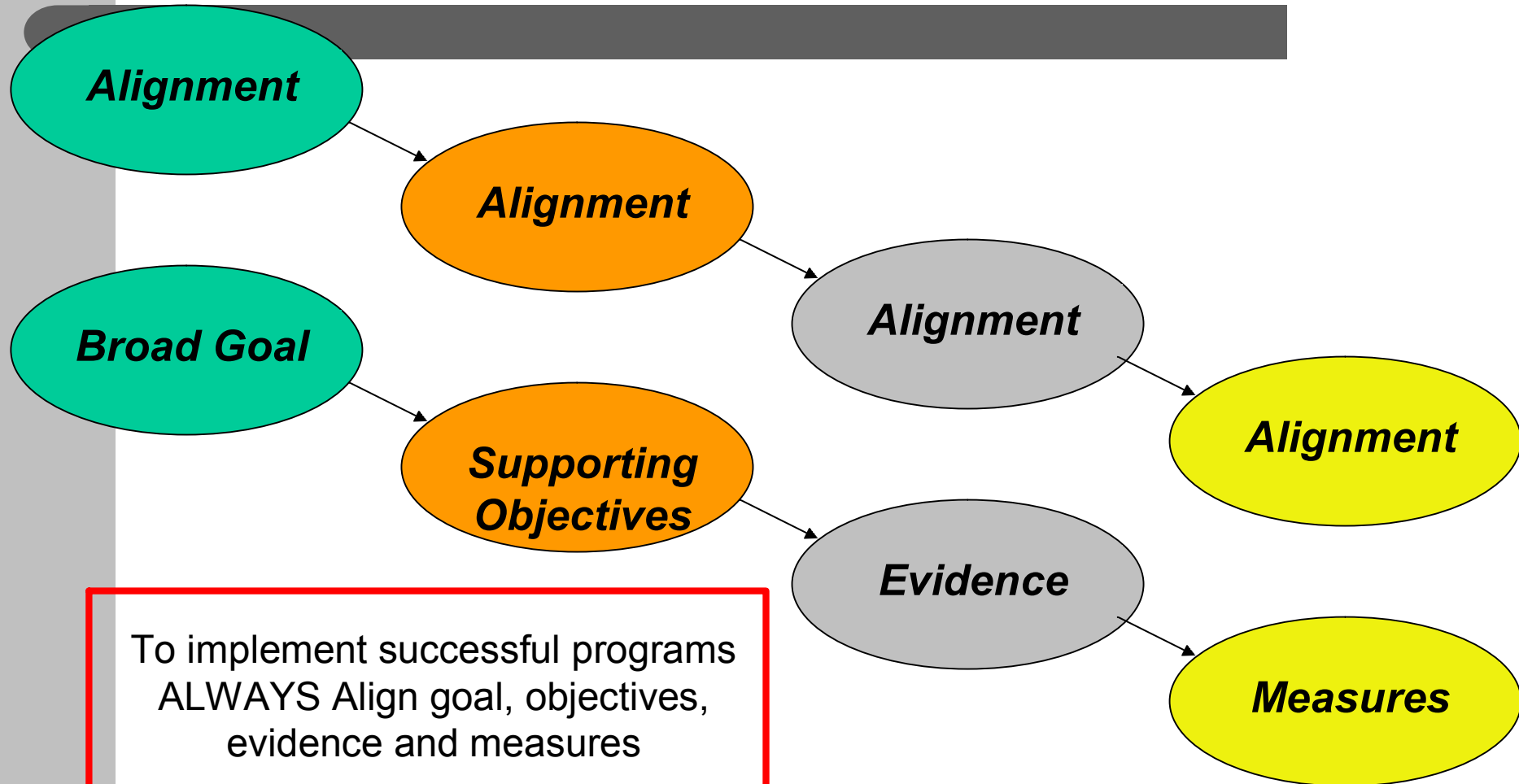




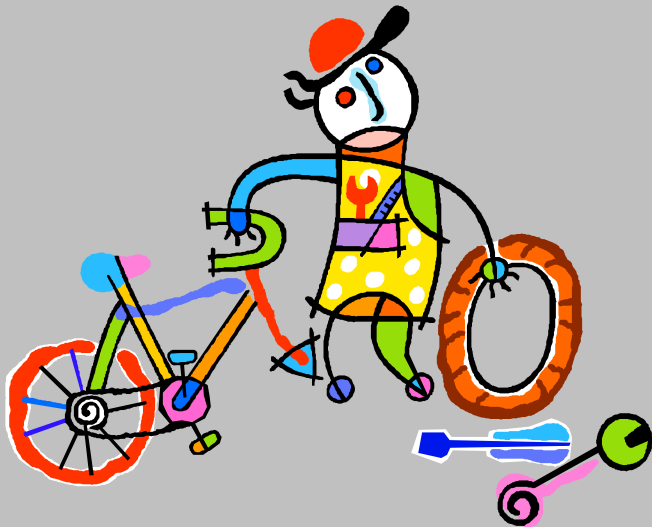
What Counts as Measurable Evidence?

Objective	Acceptable (aligned) Measures	Assessment Methods
Interest girls in studying engineering	Girls who attend camp EXPRESS interest in studying engineering	Post surveys, interviews or focus groups with girls – that address future plans & interest.
Recruit girls into engineering at PSU	Girls who attend camp enroll in engineering at PSU	Track enrollment of girl participants into engineering at PSU
Retain upper level women	Women who serve as camp leaders are retained in engineering	Track retention in engineering of women camp leaders

The Common Theme



Final Step: Use Assessment Results !



Analyze

Report

Revise

What Conclusions Can You Draw from Your Data?

- Describe patterns to explain what happened
- Compare results to measure impact



Sub-Groups by Participation Level

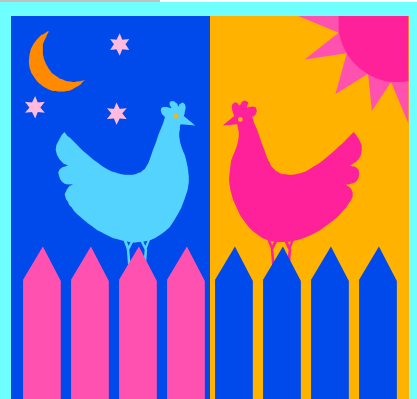


For data collection after activities, use frequent reminders to minimize bias from non-response

Let's Go Back to... That Engineering Camp

Decisions based upon assessment data related to goal and objectives:

- Moved from residential camp to day modules
 - Students can attend 1 to 5 days
 - Focus on different interdisciplinary topic each day
- Result: More focus/concentration on objectives
 - Serves more girls & women
 - Residential Camp=60 max
 - Day modules=300+
 - Increases Leadership Opportunities
 - Residential=10 leaders
 - Day Modules=60+ leaders
 - Eliminates large investment in logistics, eating, sleeping
 - Lowers Cost per girl: \$1500 to \$142



Revise, Continue, or Discontinue Based on High Quality Evidence

MTM: Anatomy of a Program Change Based on Assessment & Time/Cost Analysis

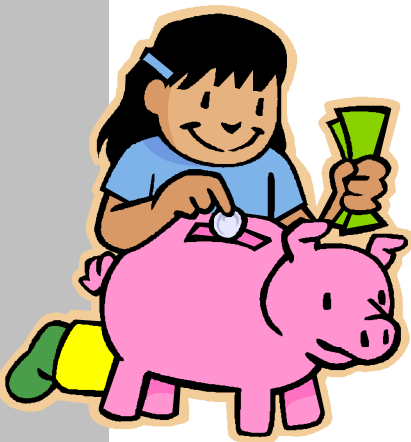
Barbara Bogue
Director, Women in Engineering
Penn State

Continue or Discontinue
Activity



Wait! What About the Sponsors?

- Use data/outcomes to explain *why* you are making changes
- Back to camp example:
 - Explained to primary sponsor why the camp needed revision
 - *Cited assessment results*
 - Sponsor **increased** support
 - Impressed with process
 - Confidence rose in ability to reach stated outcomes
 - Used story in proposals to attract more funding



Report Your Results

- Disseminate widely
 - Program stakeholders including sponsors and *internal audiences*
 - Colleagues and researchers
 - NGCP, NCWIT and other organizations
- Keep in mind
 - Publication requires IRB approval
 - Confidentiality must be maintained
 - Even “non favorable” data can be useful

Remember: Even “Bad” data can be GOOD data!
All data provide information needed to make sure you
achieve objectives

Assessment – Can be Challenging..



Assessing with limited resources:

- ✓ Time
- ✓ People
- ✓ \$\$\$

Assessment Challenges

- Supporting good assessment requires time and money
- Decide what is “worth assessing”
 - Prioritize
 - Decide what level of assessment to do on each activity
- Gather the “right” data
 - Create and test measurable objectives
 - Avoid temptation of “over assessment”
- Analyze, understand and use data

- ✓ **Save “deep” assessment efforts for highly resourced, high visibility activities**
- ✓ **Collect only data/information that you need and will use**

Leverage Resources . . .

- Use what you have at hand
- Identify & use existing instruments
 - First evaluate:
 - Do they match your objectives?
 - Fit level of assessment needed?
 - Been tested for reliability and validity?
- Use AWEonline.org tools
- Set up relationship with university unit or partner who can do complex analysis



Using & Adapting AWE Tools To Stretch Your Budget

- AWE surveys:
 - Online and in paper format
 - Customizable to your institution, organization or activity
- Access tools to support assessment
 - IRB tips, etc.
 - AWE Research Overviews and Annotated Bibliography

AWEonline.org

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[AWE PRODUCTS](#)

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ALREADY REGISTERED?

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Recently Released AWE Products

New Surveys

[College Choice Survey v1.0](#)

[Persisting in Engineering v1.0](#)

Updated Survey

AWE Registered Users Home Page

Welcome to the AWE Registered Users Home Page, New and Registered Users

[Table of Instruments](#) | [Implementing AWE Surveys](#) | [Adapting AWE Surveys](#) | [Literature Overviews](#)
[Annotated Bibliography](#) | [Survey Job Aides](#) | [ADAPT Data Management Tool](#) | [AWE Workshops](#) |
[Assessment/Evaluation Primer](#) | [Links to Relevant Sites](#)

AWE Assessment Instruments/Surveys

These assessment instruments are downloadable and may be customized to fit your institution.

[Pre-College \(Middle School and High School\) Participation Instruments](#)
[Longitudinal Assessment of Engineering Self-Efficacy \(LAESE\)](#)
[Undergraduate Mentee Instruments](#)
[Undergraduate Mentor Instruments](#)
[Undergraduate PDQ \(Pretty Dam Quick\) Instruments](#)
[Students Leaving Engineering Instrument](#)
[Students Persisting in Engineering Instrument](#)
[College Choice Survey](#)

For information on survey audience, measurements and use of data, check out the [interactive linked table of all instruments](#).

Program and Activity Development Tools

[Back to Top](#)

These tools provide summaries of the relevant literature and lists of citations that are relevant to women in engineering outreach and activity development.

Assessment Tools for You!

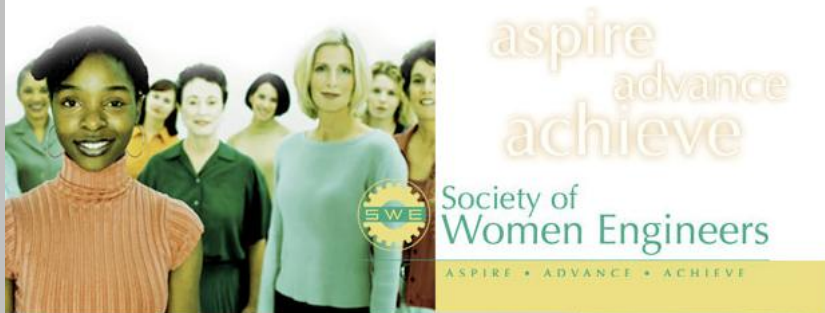
Enhance and measure the effectiveness of your recruitment and activities for women by implementing AWE's integrated suite of assessment products

Built around a family of tested and validated AWE surveys, the suite also supports program and activity development.

AWE, the NSF-funded Assessing Women in Engineering Project, offers exportable instruments, literature resources and building tools for Women in Engineering programs including surveys, data collection templates, capacity building tools and



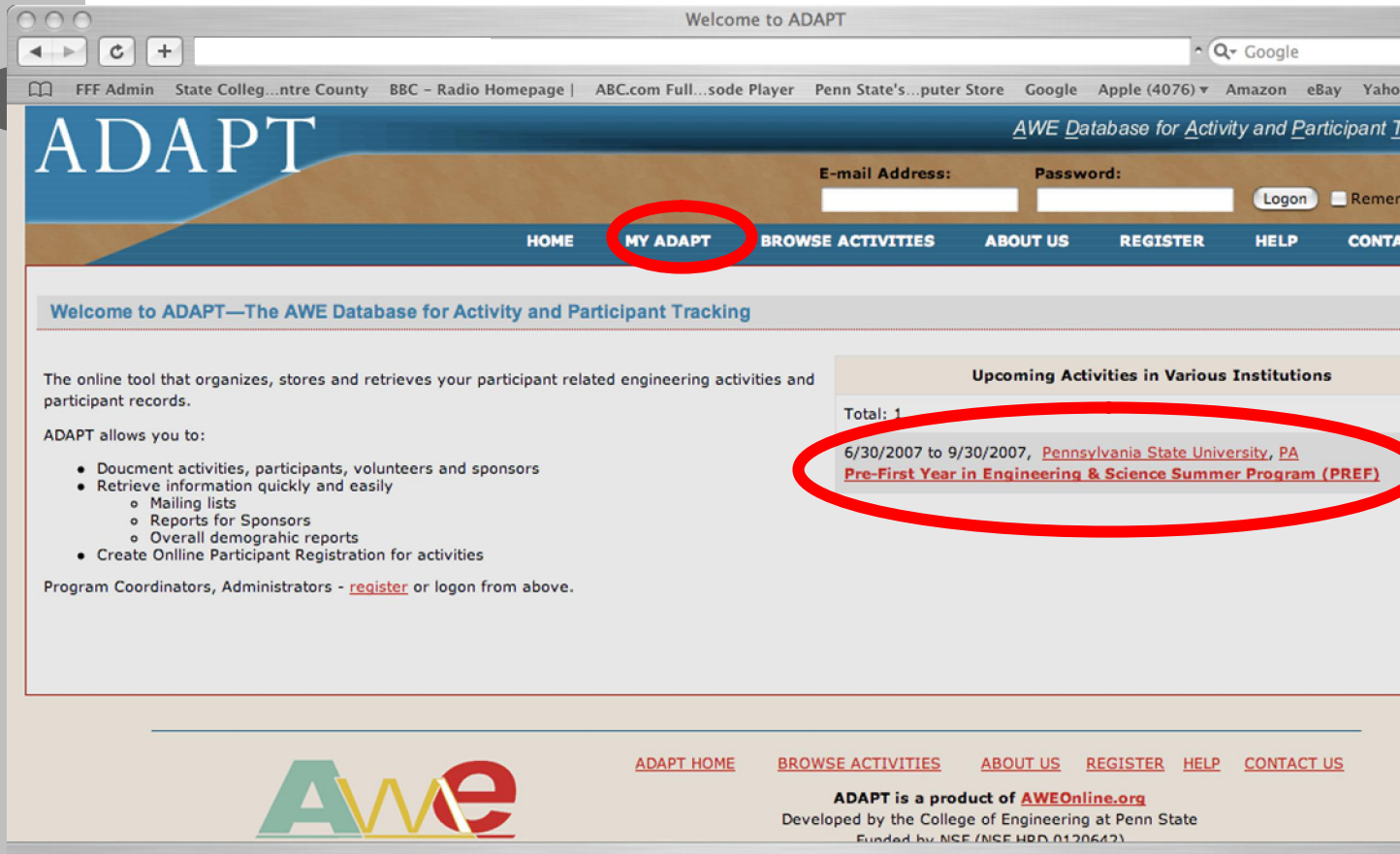
New Things Happening at AWE



*AWE is moving to
SWE!*

- SWE-AWE!
 - AWE is moving to SWE this fall
 - NSF GSE Grant
- Launch of ADAPT
 - the AWE Database for Participant and Activity Tracking

AWE ADAPT



Welcome to ADAPT

ADAPT *AWE Database for Activity and Participant Tracking*

E-mail Address: Password: Logon Remember Me

HOME **MY ADAPT** BROWSE ACTIVITIES ABOUT US REGISTER HELP CONTACT US

Welcome to ADAPT—The AWE Database for Activity and Participant Tracking

The online tool that organizes, stores and retrieves your participant related engineering activities and participant records.

ADAPT allows you to:

- Document activities, participants, volunteers and sponsors
- Retrieve information quickly and easily
 - Mailing lists
 - Reports for Sponsors
 - Overall demographic reports
- Create Online Participant Registration for activities

Program Coordinators, Administrators - [register](#) or logon from above.

Upcoming Activities in Various Institutions

Total: 1

6/30/2007 to 9/30/2007, [Pennsylvania State University, PA](#)
[Pre-First Year in Engineering & Science Summer Program \(PREF\)](#)

ADAPT HOME BROWSE ACTIVITIES ABOUT US REGISTER HELP CONTACT US

ADAPT is a product of [AWEOnline.org](#)
Developed by the College of Engineering at Penn State
Funded by NSF (NSF HRD 0120642)

My ADAPT— Welcome!

Manage Activities

- [Add Activity](#)
- [View/Edit Activities](#)
- [Help](#)

Manage Participants

- [Add Participant\(s\)](#)
- [View/Edit Participants/Quick Count](#)
- [Search Participants](#)
- [Help](#)

Manage Sponsors

- [Add/Edit Sponsor](#)
- [Add Sponsor Contact](#)
- [View/Edit Contacts](#)
- [Help](#)

Manage Users

- [Add User](#)
- [View/Edit Users](#)
- [Help](#)

Manage Reports

- [Activity Reports](#)
- [Link 2](#)

Account Maintenance

- [Pre-Populate Major List](#)

What were the highlights?



- ✓ Use assessment to drive planning
- ✓ Align, align, align
- ✓ Use your data
- ✓ Leverage resources

Learn More / Contact Us

- www.AWEonline.org
 - **Free** registration provides access to all tools
 - AWE news featured on NGCP E-Newsletter
 - Watch for new product announcements and the launch of SWE-AWE
- Contact us ...
 - R. Marra (rmarra@missouri.edu)
 - B. Bogue (bbogue@psu.edu)





Additional NGCP Information

Program Directory

www.pugetsoundcenter.org/ngcp/directory/index.cfm

Join the NGCP listserv

www.pugetsoundcenter.org/ngcp/resources/newsletter.html

Upcoming Webcasts

- Tools for Collaboration Success: NGCP Mini-Grants
Wednesday, October 10, 2007 11:00-12:00 Pacific DST
- Informal Learning – Promising practices with girls in STEM
Date TBA – November 2007