Learning Abroad, Learning Together
Creating Successful International Faculty Professional Development Opportunities

NSF-ATE Center for Renewable Energy Advanced Technological Education

DUE #1600934 & #1800893
The BIG PICTURE: CREATE's Energy Storage Project

The overarching goal of CREATE's Energy Storage Project is to advance the field of renewable energy by supporting the integration of energy storage technology into existing two-year college programs, creating high school pathways and partnerships.
CREATE's Energy Storage Project

Objective One:
Examine existing model energy storage education efforts already pioneered in European countries.

Activity: Faculty Study Tour
Competitive selection of diverse educator cohort for study tour to Germany to meet initial project objective.
CREATE Faculty Study Tour

Planning the Itinerary

Visits were arranged to a variety of sites (academic, industrial, policy-making, commercial) which provided participants with opportunities to query technical experts, record first-hand observations, and build knowledge regarding the use, development and expansion of renewable energy and energy storage technologies in Germany and related educational efforts.
Prior to Travel

Learning Objectives

• provide context and baseline knowledge
• capture, exchange existing knowledge
• build community, foster collaborative learning
• establish rigor
# CREATE Faculty Study Tour

## Prior to Travel

<table>
<thead>
<tr>
<th>Learning Activity</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-participation Survey</td>
<td>Inform selection of pre-travel learning materials, provide baseline data</td>
</tr>
<tr>
<td>Weekly readings and guided online discussions</td>
<td>Provide information on German education system, culture, energy policy and storage technologies; foster learning community; establish rigor</td>
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<tr>
<td>Monthly webinars</td>
<td>Share information, increase participant connections</td>
</tr>
<tr>
<td>Pre-visit Site Reports</td>
<td>Increase awareness of sites and peers; reinforce rigor</td>
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<tr>
<td>Individual Inquiry question selection</td>
<td>Selection of focus for individual research; reinforce rigor</td>
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During Travel

Learning Objectives

• ensure daily capture of knowledge and experiences
• promote reflection
• stimulate participation in collaborative/team learning
• encourage rigor
## CREATE Faculty Study Tour

### During Travel

<table>
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<tr>
<th>Learning Activity</th>
<th>Purpose</th>
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</thead>
<tbody>
<tr>
<td>Presentation of Pre-visit Site Reports</td>
<td>Reinforce team awareness and knowledge of site immediately prior to visit; deepen peer connections</td>
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<tr>
<td><em>(peer presentations enroute to sites)</em></td>
<td></td>
</tr>
<tr>
<td>Site Visit reports</td>
<td>Daily capture of knowledge gains, experience; guided inquiry to stimulate reflection; sustain rigor.</td>
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<tr>
<td><em>(one report per site, due daily)</em></td>
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<tr>
<td>Individual Inquiry research</td>
<td>Anchor experience; capture individually relevant information and experiences</td>
</tr>
</tbody>
</table>
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After Travel

Learning Objectives

• capture and preserve summative knowledge gains
• support dissemination of key findings
• facilitate assessment of pre/post knowledge
# CREATE Faculty Study Tour

## After Travel

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<th>Learning Activity</th>
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<tbody>
<tr>
<td>Individual Inquiry Reports</td>
<td>Anchored learning experience; individualized outcome</td>
</tr>
<tr>
<td>Post-participation survey</td>
<td>Collect data to compare against pre-participation survey responses; solicit feedback on trip logistics and planning.</td>
</tr>
<tr>
<td>Follow-up survey <em>(conducted 8 months post-travel)</em></td>
<td>Deepen awareness of project impacts; solicit reflective feedback on learning experience; gain insights into practical applications</td>
</tr>
<tr>
<td>Conference sessions, paper submissions, publications</td>
<td>Dissemination of technical knowledge, project results; synthesize acquired knowledge</td>
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Participant Feedback

During the follow-up survey, participants were queried regarding the initial value and lasting impact of the various learning activities both to inform internal and external future efforts. A brief overview of their responses follows.
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Participant Feedback

Perceived value of pre-travel activities

Highest rated:

• Preparing Pre-Visit Site Reports for others
• Required readings
• Crafting a question for my Individual Inquiry

Lowest rated:

• Reviewing posted Pre-Visit Site Reports
• Listening to Pre-Visit Site Reports on webinar

Key findings: All pre-travel activities were predominantly rated as useful ("very useful" or "somewhat useful"). Passive activities received the lowest ratings.
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Participant Feedback

Perceived value of activities during travel

**Highest rated:**
- Pre-seminar at Bolle Foundation
- Listening to enroute Pre-Visit Site Reports
- "Gathering info for Individual Inquiry"
- Writing Site Reports

**Lowest rated:**
- Reviewing peers' Pre-Visit Site Reports online

**Key findings:** All activities during travel were again predominantly ranked as useful with an increased frequency of "very useful" responses. Passive activities again received the lowest ratings
Perceived value of post-travel activities

**Highest rated:**
- Completing Individual Inquiry Report
- Participating as a presenter, author or panelist

**Key findings:** All post-travel activities – to date - were rated as "very useful" or "somewhat useful".

More data will be collected in this category.
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Participant Feedback

Learning Activities Take-Aways

• **Active learning** in which knowledge and information is constructed, shared or discussed is preferred to passively receiving information.

• Participants found the **pre-travel seminar**, hosted by a German foundation and providing overviews of the German educational system, energy policy and energy technology, very helpful.

• Only a scant few learning activities were rated as "not very useful" and **none were deemed to be "not useful at all".**
CREATE Faculty Study Tour
Participant Feedback

Perceived Impact on Professional Development

Highest rated:

- Exposure to new technologies
- Developed professional relationships with fellow participants
- Developed an understanding of renewable energy policy outside the United States

Open-text item ("greatest professional development gain"):

- Four of seven mentioned professional knowledge advancement in the area of energy storage
- Two of seven noted connections formed with colleagues
CREATE Faculty Study Tour
Participant Feedback

Perceived Lasting Impact on Professional Development

Highest rated:

- Exposure to new technologies
- Working, traveling, learning with educator/peers
- Visiting industry sites
- Exposure to non-U.S. energy storage deployment

Consistent Findings:

- Responses 8 months after travel are almost identical to initially reported professional development gains
- Additional follow-up surveys will assess whether responses continue pattern of consistency
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RECOMMENDATIONS

• **Recruit deliberately.** Use a rigorous selection process to assemble a strong group that embodies professional diversity and excellence and ensures commitment by those selected.

• **Use pre-travel time wisely.** Well-constructed pre-travel activities and required assignments can ensure participants access learning materials, establish baseline knowledge, foster peer relationships, and build context. This front-end work also helps ensure the best use of valuable time abroad.

• **Make them write.** Ensure knowledge capture and retention by requiring daily writing exercises while traveling. Travel fatigue can blur retention!

• **Support integration when travel ends.** Utilize post-travel assignments to facilitate acquired knowledge integration into professional and instructional practices. Personal learning goals set prior to travel and reported out post-travel can be helpful in accomplishing this.
RECOMMENDATIONS

• **Plan and budget for dissemination.** Conference presentations, panel discussions and article submissions cement lessons learned and provide opportunities for participants to share experiences with others, thereby magnifying the impact of the project.

• **Assess short- and long-term impacts.** The impacts of professional development experiences often take 1-2 years to manifest. It is important to plan and budget accordingly to capture true project successes.

• **Don't underestimate the amount of work involved!** At a minimum, create a leadership team that includes the project lead, a program coordinator to handle logistics, and a learning specialist to develop, implement and manage the learning activities. Each performs distinct and necessary duties to ensure the study tour meets its goals. Ideally, this team would be expanded to make the workload manageable for all.
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Thank You!

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