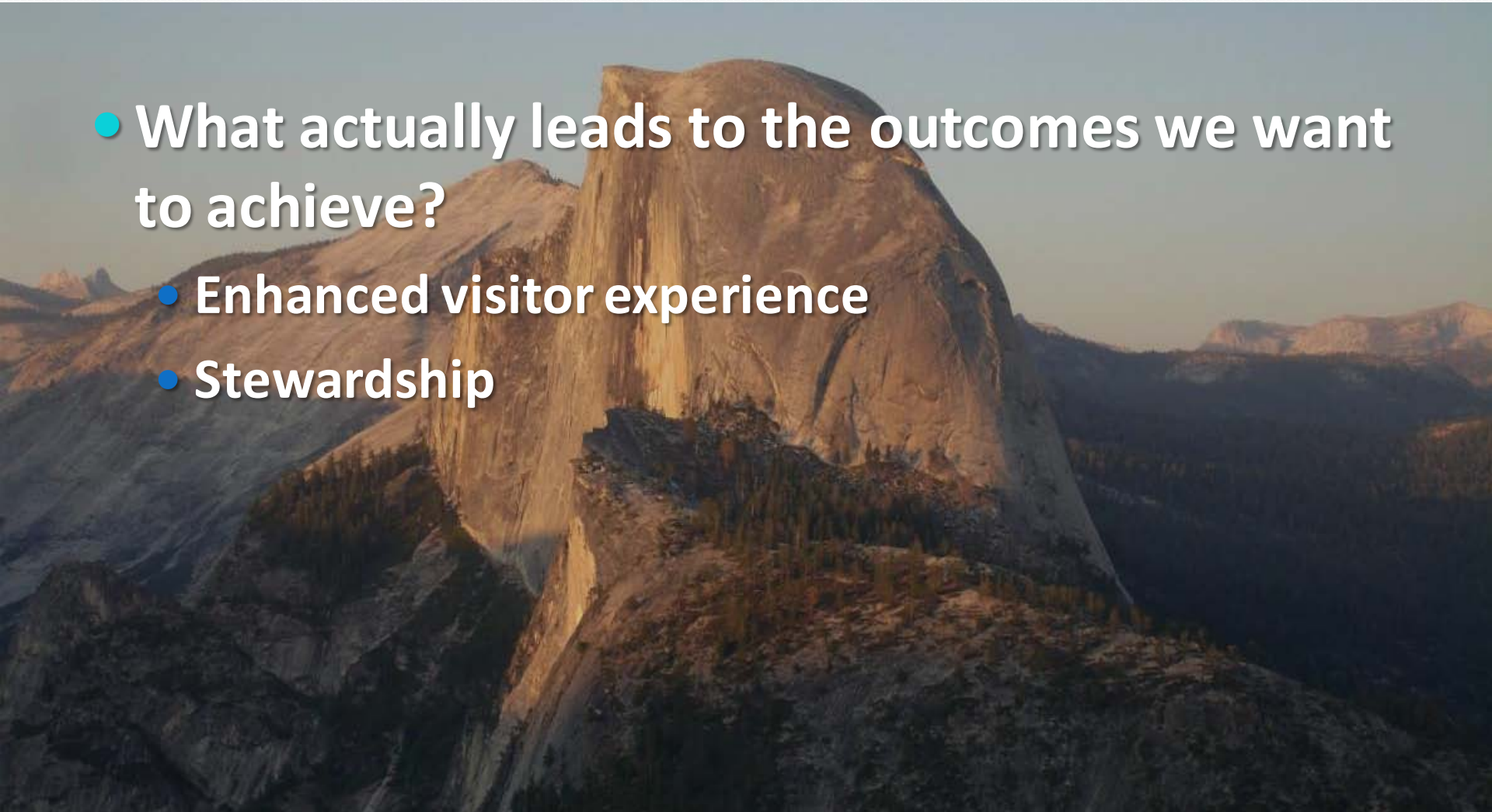


Aligning best practices with outcomes:  
Lessons from the empirical literature and a  
large sample study in interpretation

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# The Park Service's Challenge

- What actually leads to the outcomes we want to achieve?
  - Enhanced visitor experience
  - Stewardship



# Exploring the empirical literature

## Environmental education

- NAAEE guidelines
- IEEIA
- Constructivism
- Others

## Interpretation

- Tilden's principles (abridged and updated)
  - Relate to the lives of the visitor
  - Tell a holistic story
  - Provoke reflection and/or connection
  - Connect facts with deeper meaning
  - Age (and culture) appropriate
- Ham's principles
  - Entertaining, relevant, organized, and thematic
- Others

# EE empirical literature (1999-2011)

- 83 articles, evaluating 106 programs

Outcome	Measured	Positive finding
Knowledge	88	89%
Awareness	21	95%
Skills	25	80%
Attitudes	66	70%
Intention	24	75%
Behavior	26	85%
Satisfaction/enjoyment	18	83%

Program characteristics	Observed	Positive	Adapted	Null
Project-based learning**	28	86%	14%	0%
Investigation**	53	81%	13%	6%
Explicit reflection incorporated	43	81%	14%	5%
Benefits of action stressed	9	78%	22%	0%
Cooperative/group learning	37	78%	16%	5%
Issue-based learning	51	78%	14%	8%
Student-centered	13	77%	23%	0%
Hands-on observation & discovery	67	76%	13%	10%
Skill development or demonstration of behavior	12	75%	17%	8%
Active participation	84	74%	17%	9%
Multiple points of view	15	73%	20%	7%
Place-based learning	66	73%	17%	11%
Content focused on interconnectedness	29	72%	17%	10%
Content focused on species or habitat	53	70%	17%	13%
Multi-modal delivery of content	75	68%	21%	11%
Specific attempt to relate to lives of students	29	66%	24%	10%
Play-based learning	13	62%	15%	23%
Lecture-based instruction	33	61%	27%	12%
Inside only	28	61%	25%	14%
Social norms incorporated into message*	7	43%	57%	0%
Traditional*	4	0%	25%	75%

Explanatory factor	Speculative claims		Empirical support
	Outcomes	Claims	
Experiential	All	28	4
Issue-based	All	25	3
Dosage	All	24	7
Direct contact with nature	All	24	2
Empowerment (focus on self-efficacy)	All	20	1
Investigation component	All	17	4
Place-based	All	15	2
Explicit reflection	All	14	1
Project-based	All	13	2
Connection to home lives of participants	All but intentions	13	1
Affective elements explicitly incorporated	All	13	--
Active participation	All	13	--
Focus on consequences of environmental problems	All	12	3
Style or identity of presenter/educator	All but skills	12	2
Action component	All	11	1
Group discussion or cooperative group work	All	9	3
Mismatch between goals and program design (-)	All	8	--
Multiple generations	All but skills	7	1
School teacher involvement	All but enjoyment	6	1
Multiple viewpoints	All	5	--
Play-based learning	All	5	2
Schematization of concepts (causal chains)	Knowledge, skills	3	1

# EE lit review conclusions

- Circumstantial evidence favors all consensus-based best practices
- Authors and meta-analysis hone in most powerfully on:
  - Dosage
  - Experiential approaches
  - IEEIA principles (investigation, issue-based, group work, etc.)
  - Reflection and relevance
  - Empowerment
  - Design alignment with goals
- Other speculations:
  - Place-based; outdoors
  - Affective elements
  - Styles/qualities of educators
- Caveats:
  - Presence could be confirmed, not absence
  - Presence or absence does not account for quality
  - Null results less commonly reported
  - Coincidence does not mean causation (isolation rare)

# Empirical study in the Parks

- 24 park units
- 376 live interpretive programs
- 3,603 retrospective visitor surveys



# Outcomes

- Satisfaction with the program
- Visitor experience and appreciation
  - Meaningfulness, knowledge, appreciation for park and resources
- Behavioral change
  - To what extent did the program influence future behavior in park and at home

# Best practices

- **Confidence**
  - Comfort, eloquence, apparent knowledge
- **Authentic emotion and charisma**
  - Passion, sincerity, charisma
- **Appropriateness for audience**
- **Organization**
  - Quality of introduction, appropriate sequence, effective transitions, holistic story, clear theme, link between introduction and conclusion
- **Connection**
  - Links to intangibles and universal concepts, cognitive engagement, relevance to audience, affective messaging, provocation
- **Consistency**
- **Clear message**
- **Responsiveness**
- **Audibility**
- **Appropriate logistics**
- **Verbal engagement**
- **Multisensory engagement**
- **Appropriate pace**
- **Avoid focusing on knowledge gain as the program's central goal and communicating solely factual information**
- **Avoid making uncertain assumptions about the audience**

# What translates to EE?

- The role of the individual educator is largely missing from EE empirical studies and mainstream EE theory.
- Affective domain stressed in EE theory, but not as much in recent empirical studies.
- Holistic approach (such as IEEIA) that actively engages the student in a complete experience

# Ideas about best practices

- NAAEE guidelines are on the right track
- Longer experiences with preparation and follow-up
- IEEIA and similar *holistic* experiential approaches that ground education in *relevant* real world contexts
  - Findings suggest that explicit affective components may further enhance their effectiveness
- Explicit reflection appears to enhance outcomes
- Align program design with goals
- The role of the educator (their identity, style, and, in particular, sincerity) has been largely ignored
- Commitment of educators to goals of programs

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