

# Implications of Practice-Based Research Syntheses for Early Childhood Intervention Practices

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# Purpose of the Presentation

- Describe a practice-based translational approach to conducting research syntheses
- Illustrate the approach using a synthesis of adult learning methods and strategies
- Describe how the findings from the synthesis were used to develop an evidence-based approach to professional development

# Types of Research Syntheses

- Efficacy Syntheses
- Efficiency Syntheses
- Translational Syntheses

## Purpose of Efficacy Syntheses

Ascertain the size of effect for an intervention (treatment, practice, etc.) comparing the outcome of an intervention group against a nonintervention group. Efficacy syntheses typically combine findings from different studies using randomized controlled trials or similar types of research designs.

## Purpose of Efficiency Syntheses

Ascertain the size of effect for the difference between two or more contrasting interventions (treatments, practices, etc.) that are hypothesized to have the same outcomes or effects. Efficiency syntheses focus on which types of interventions with which types of features are associated with the largest effect size on outcomes of interest.

# Purpose of Translational Syntheses

Ascertain the size of effect for the specific characteristics and features of an intervention (treatment, practices, etc.) that are associated with study outcomes. Translational syntheses focus on ***unpacking*** and ***unbundling*** an intervention to isolate the practice characteristics that “matter most” in terms of explaining the results found in different studies of the same or similar interventions.

# Practice-Based Translational Research Syntheses

Practice-based research syntheses are a particular type of translational research synthesis where the main focus of analysis is the identification of the practice-related characteristics that directly inform the conduct of interventions and the conditions under which the interventions have optimal effects and outcomes. Child, parent-child, parent, family, classroom, and other kinds of interventions are amendable to practice-based meta-analysis.

# Examples of Practice-Based Research Syntheses

- Dunst, C. J., Gorman, E., & Hamby, D. W. (2010). Effects of adult verbal and vocal contingent responsiveness on increases in infant vocalizations. *CELLreviews*, 3(1), 1-11.
- Trivette, C. M., Dunst, C. J., & Gorman, E. (2010). Effects of parent-mediated joint book reading on the early language development of toddlers and preschoolers. *CELLreviews*, 3(2), 1-15.
- Dunst, C. J., & Kassow, D. Z. (2008). Caregiver sensitivity, contingent social responsiveness, and secure infant attachment. *Journal of Early and Intensive Behavior Intervention*, 5, 40-56.
- Trivette, C. M., Dunst, C. J., Hamby, D. W., & O'Herin, C. E. (2010). Effects of different types of adaptations on the behavior of young children with disabilities. *Research Brief (Tots n Tech Research Institute)*, 4(1), 1-26.
- Dunst, C. J., Trivette, C. M., & Hamby, D. W. (2007). Meta-analysis of family-centered helping practices research. *Mental Retardation and Developmental Disabilities Research Reviews*, 13, 370-378.
- Dunst, C. J., Trivette, C. M., Meter, D., & Hamby, D. W. (2011). Influences of contrasting types of training on practitioners' and parents' use of assistive technology and adaptations with infants, toddlers and preschoolers with disabilities. *Practical Evaluation Reports*, 3(1), 1-35.



# **Examples of Findings from the Three Types of Research Syntheses**

# Research Synthesis of Adult Learning Studies<sup>a</sup>

- Research synthesis of studies of accelerated learning, coaching, guided design, and just-in-time training
- 58 randomized control design studies
- 2,095 experimental group participants and 2,213 control or comparison group participants
- Combination of studies in university and non-university settings
- Learner outcomes included learner knowledge, skills, attitudes, and self-efficacy beliefs
- The influence of the adult learning methods on the learner outcomes was estimated by weighted Cohen's *d* effect sizes for the differences on the post test scores for the intervention vs. nonintervention group participants

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<sup>a</sup> Dunst, C.J., Trivette, C.M., & Hamby, D.W. (2010). Meta-analysis of the effectiveness of four adult learning methods and strategies. *International Journal of Continuing Education and Lifelong Learning*, 3(1), 91-112.

# Adult Learning Methods and Strategies

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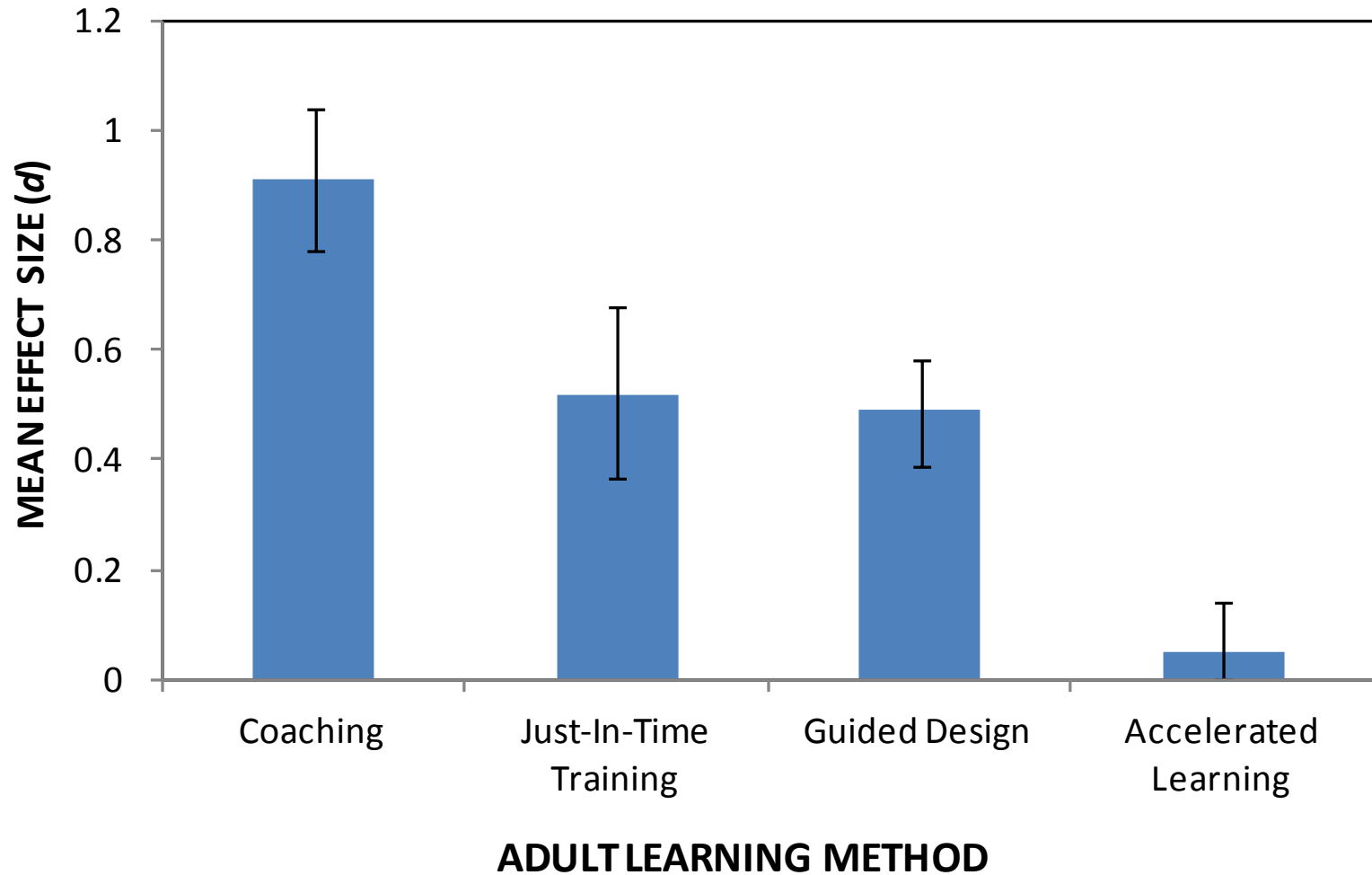
Methods	Description
Accelerated Learning	“Creating a relaxed emotional state, an orchestrated and multi-sensory learning environment, and active learner engagement” (Meier, 2000).
Coaching	“Method of transferring skills and expertise from more experienced and knowledgeable practitioners to less experienced ones” (Hargreaves & Dawe, 1990).
Guided Design	“Method characterized by decision-making and problem solving processes that include procedures to using real world problems for mastering learning content (through) facilitator guidance and feedback” (Wales & Stager, 1998).
Just-in-Time Training	“Training methods and strategies used in the context of real-life challenges in response to learner requests for guidance or mentoring” (Beckett, 2000).

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## Efficacy of the Adult Learning Methods

Effect size for the intervention vs. nonintervention group comparisons was  $d = .42$  (95% Confidence Interval = .36 to .47). The use of the adult learning methods compared to “business-as-usual” was associated with differences in the learner outcomes.

# Efficiency of the Four Adult Learning Methods



## Translational Findings

The unpacking and unbundling of the key characteristics of the adult learning methods was accomplished by coding and analyzing the use of different kinds of practices and by examining the conditions under which the use of specific combinations of practices were associated with optimal learner benefits.

# Characteristics Used to Code and Evaluate the Implementation Studies<sup>a</sup>

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## *Planning*

**Introduce** Engage the learner in a preview of the material, knowledge or practice that is the focus of instruction or training

**Illustrate** Demonstrate or illustrate the use or applicability of the material, knowledge or practice for the learner

## *Application*

**Practice** Engage the learner in the use of the material, knowledge or practice

**Evaluate** Engage the learner in a process of evaluating the consequence or outcome of the application of the material, knowledge or practice

## *Deep Understanding*

**Reflection** Engage the learner in self-assessment of his or her acquisition of knowledge and skills as a basis for identifying “next steps” in the learning process

**Mastery** Engage the learner in a process of assessing his or her experience in the context of some conceptual or practical model or framework, or some external set of performance standards or criteria

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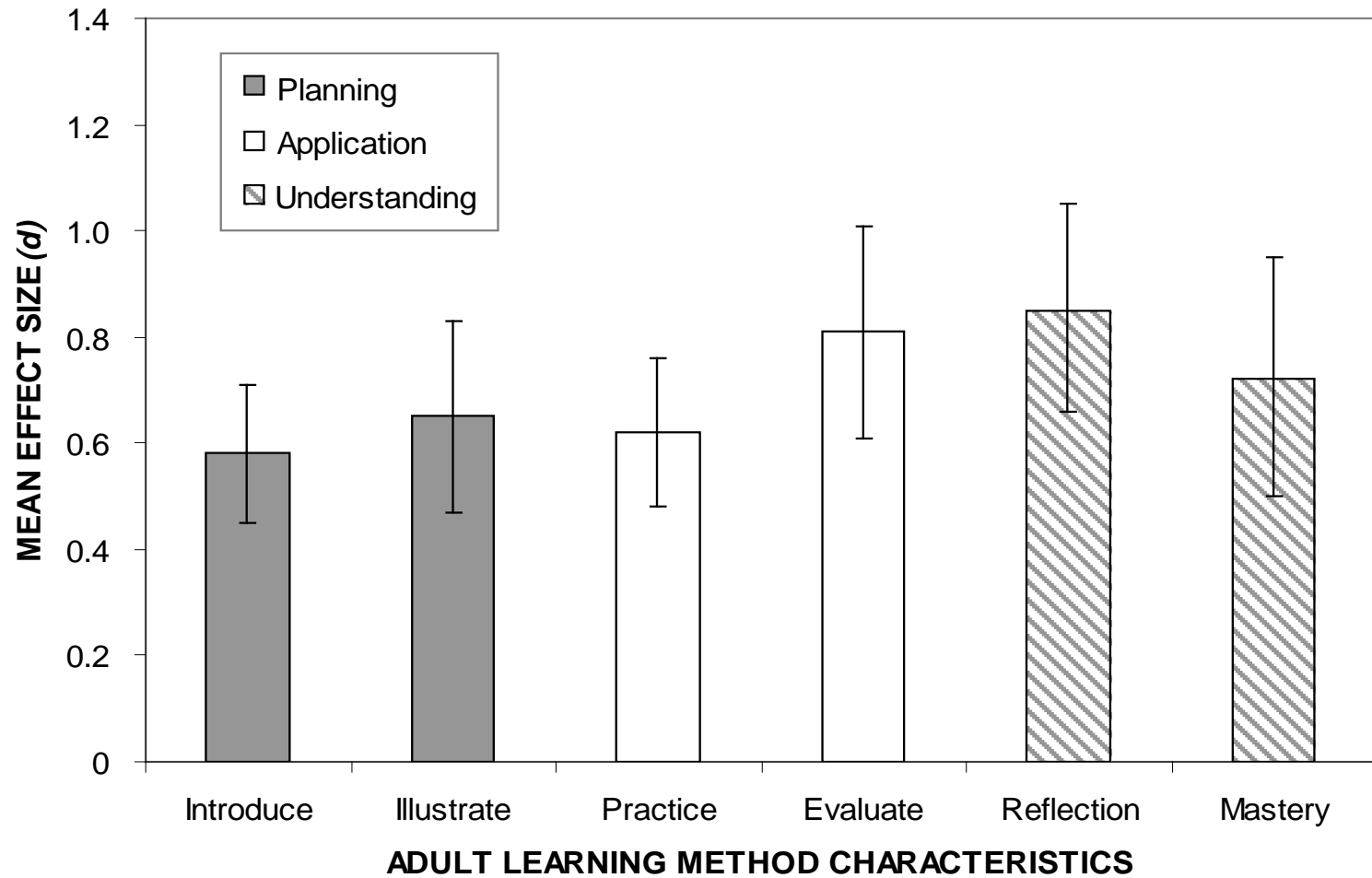
<sup>a</sup> Donovan, M. et al. (Eds.) (1999). *How people learn*. Washington, DC: National Academy Press.

# Categorization and Coding of the Adult Learning Method Practices

Characteristics	Different Number of Practices	Number of Coded Practices
<i>Planning</i>		
Introduce	16	6
Illustrate	15	4
<i>Application</i>		
Practice	16	5
Evaluate	8	2
<i>Deep Understanding</i>		
Reflection	4	3
Mastery	2	2
Total	61	22



# Effect Sizes for the Six Adult Learning Characteristics



## Effect Sizes for Introducing Information to Learners

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Practices	Number		Mean Effect Size ( <i>d</i> )	95% Confidence Interval
	Studies	Effect Sizes		
Pre-class/workshop exercises	9	9	1.02	.63-1.41
Out of class activities/self- instruction	12	20	.76	.44-1.09
Classroom/workshop lectures or presentations	26	108	.68	.47-.89
Dramatic readings	18	40	.35	.13-.57
Imagery	7	18	.34	.09-.59
Dramatic readings/imagery	4	11	.15	-.33-.62

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## Effect Sizes for Illustrating/Demonstrating Learning Topic

Practices	Number		Mean Effect Size ( <i>d</i> )	95% Confidence Interval
	Studies	Effect Sizes		
Using learner input for illustration	6	6	.89	.28-1.51
Instructor role playing/simulations	20	64	.87	.58-1.17
Instructor real-life demonstration/ real-life + role playing	6	10	.67	.27-1.07
Instructional video	5	49	.33	.09-.59

## Effect Sizes for Learner Application

Practices	Number		Mean Effect Size ( <i>d</i> )	95% Confidence Interval
	Studies	Effect Sizes		
Real life application + role playing	5	20	1.10	.48-1.72
Problem solving tasks	16	29	.67	.39-.95
Real life application	17	83	.58	.35-.81
Learning games/writing exercises	9	11	.55	.11-.99
Role playing (skits, plays)	11	35	.41	.21-.62

## Effect Sizes for Learner Evaluation

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Practices	Number		Mean Effect Size ( <i>d</i> )	95% Confidence Interval
	Studies	Effect Sizes		
Assess strengths/weaknesses	14	48	.96	.67-1.26
Review experience/make changes	19	35	.60	.36-.83

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## Effect Sizes for Learner Reflection

Practices	Number		Mean Effect Size ( <i>d</i> )	95% Confidence Interval
	Studies	Effect Sizes		
Performance improvement	9	34	1.07	.69-1.45
Journaling/behavior suggestion	8	17	.75	.49-1.00
Group discussion about feedback	16	29	.67	.39-.95

## Effect Sizes for Self-Assessment of Learner Mastery

Practices	Number		Mean Effect Size ( <i>d</i> )	95% Confidence Interval
	Studies	Effect Sizes		
Standards-based assessment	13	44	.76	.42-1.10
Self-assessment	16	29	.67	.39-.95

# Most Effective Adult Learning Method Practices

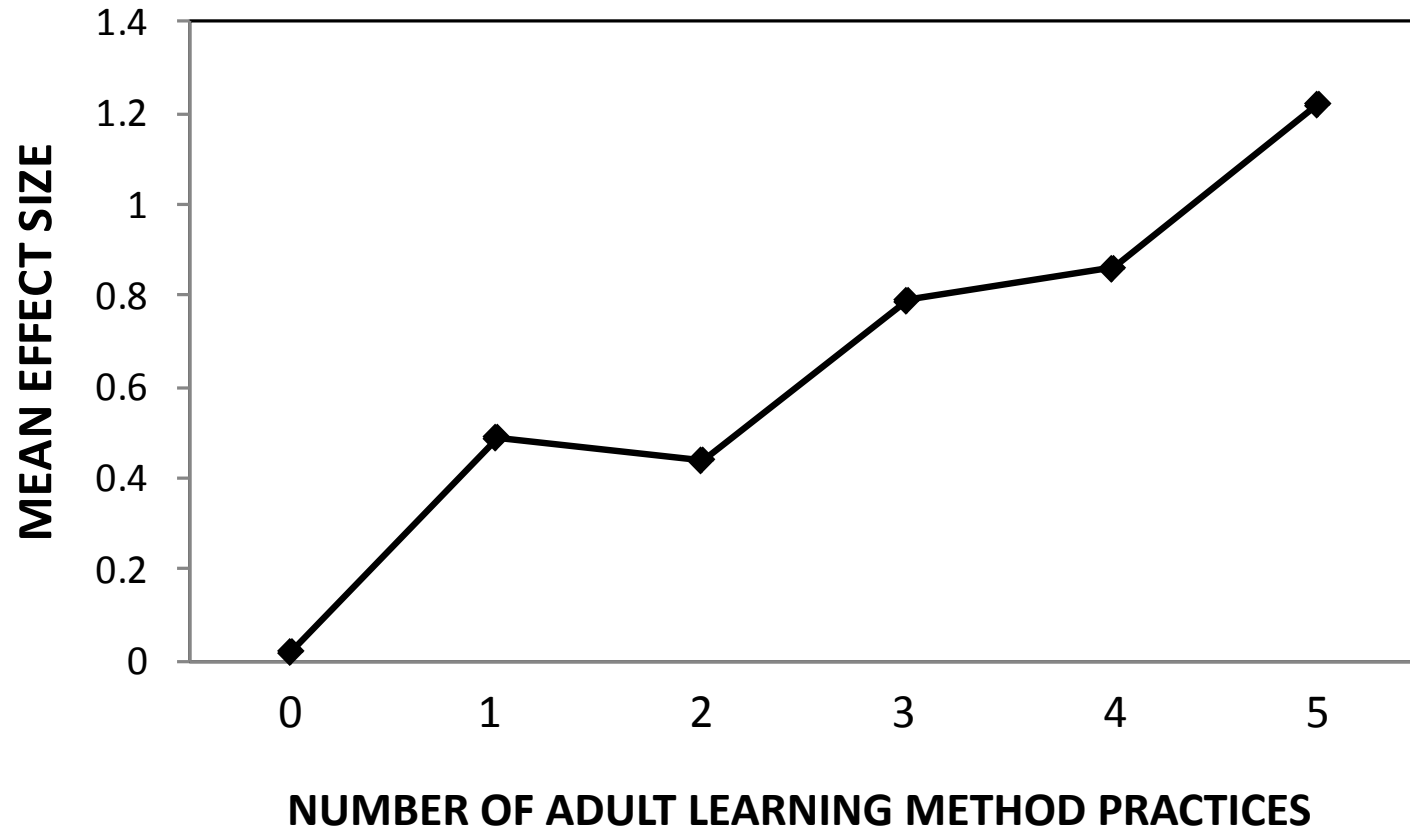
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Characteristic	Practice	Mean Effect Size
<i>Introduction</i>	Out-of-class learner activities/self-instruction	0.64
	Classroom/workshop presentations	0.63
	Pre-class learner exercises	0.54
<i>Illustration</i>	Trainer role playing/simulations	0.55
	Learner-informed input	0.53
<i>Practicing</i>	Real-life learner application	0.94
	Real-life learner application/role playing	0.86
<i>Evaluation</i>	Self assessment of strengths/weaknesses	0.94
<i>Reflection</i>	Identify performance improvement goals	1.27
	Journaling/behavior suggestions	0.82
<i>Mastery</i>	Standards-based assessment	0.86

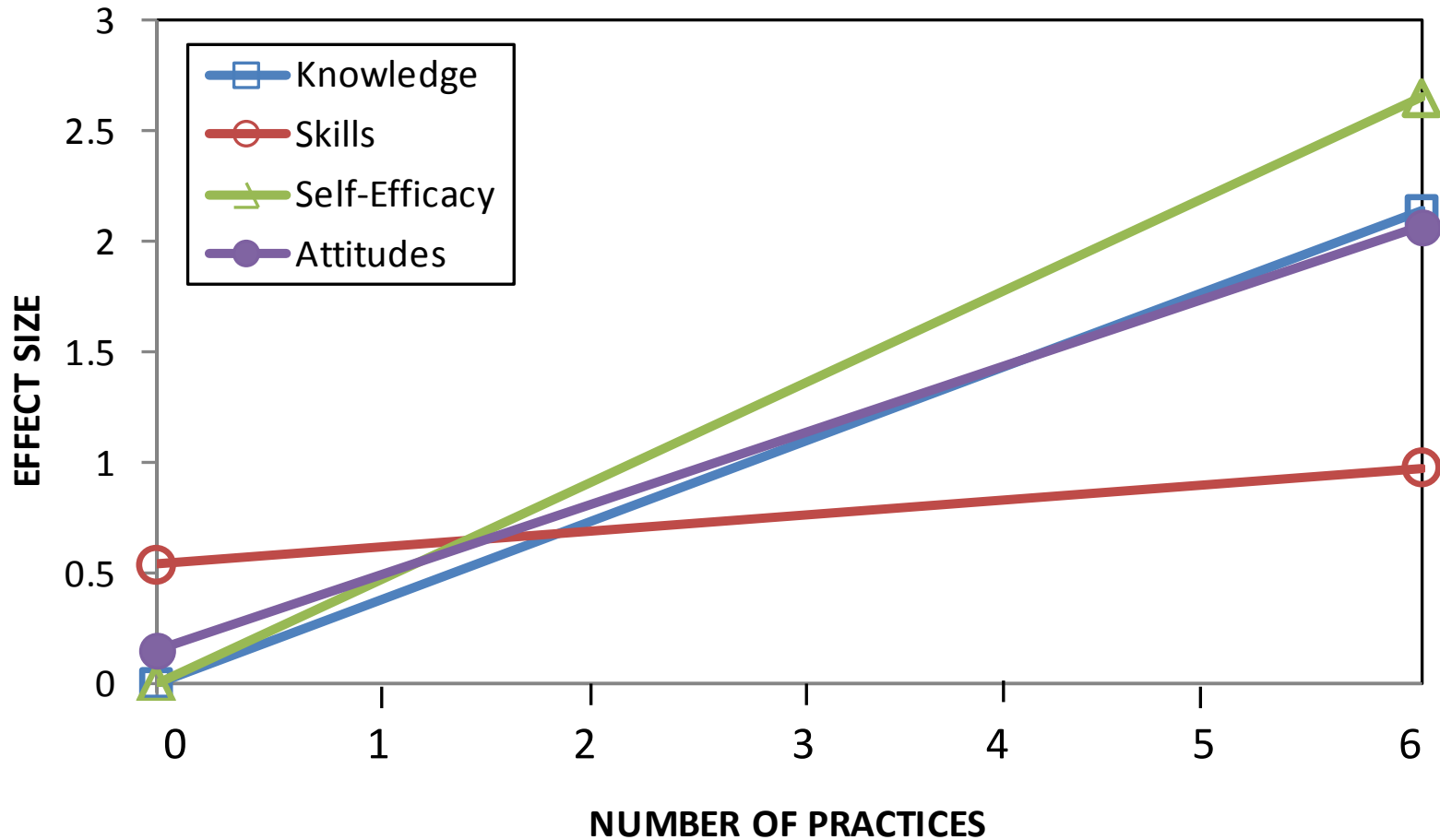
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# Cumulative Effects of Different Combinations of the Most Effective Adult Learning Method Practices



# Relationship Between Number of Practices and the Different Learner Outcomes

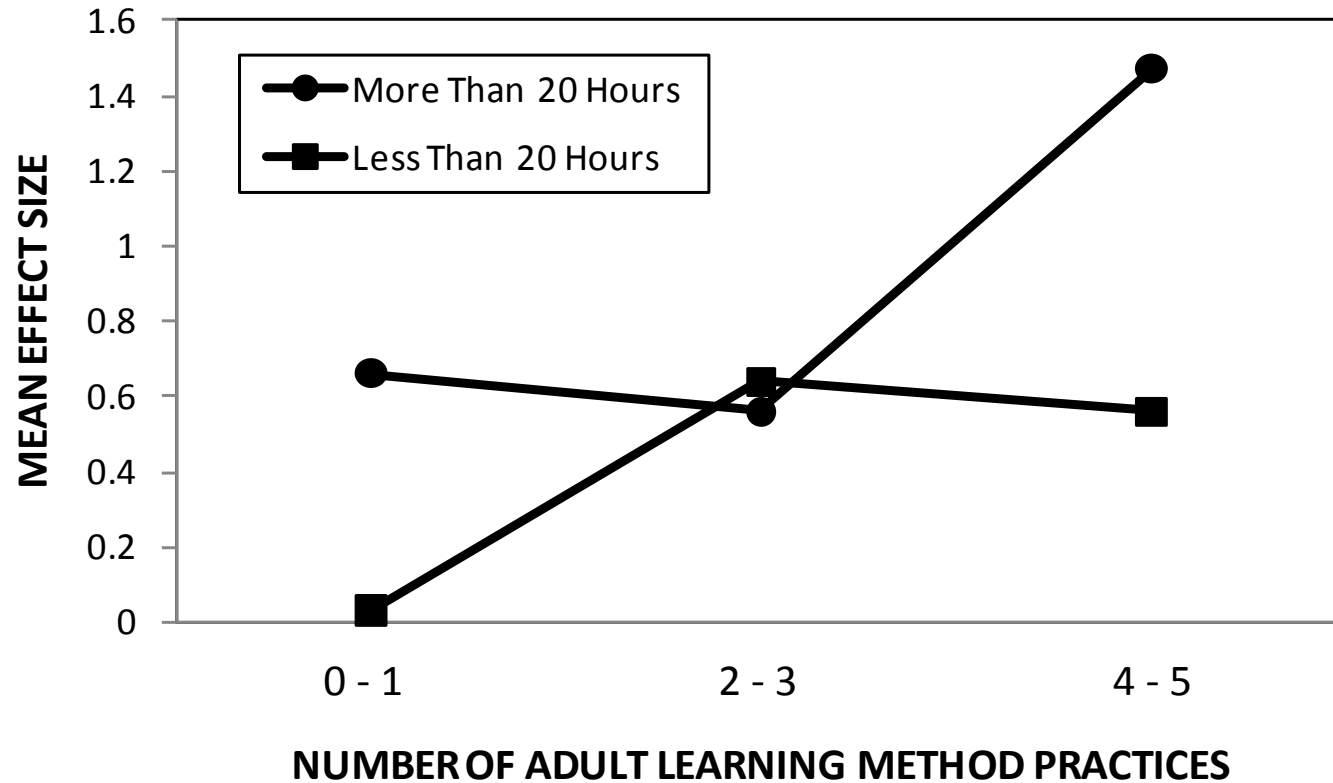


# Moderators of the Relationships Between the Use of the Most Effective Practices and the Learner Outcomes

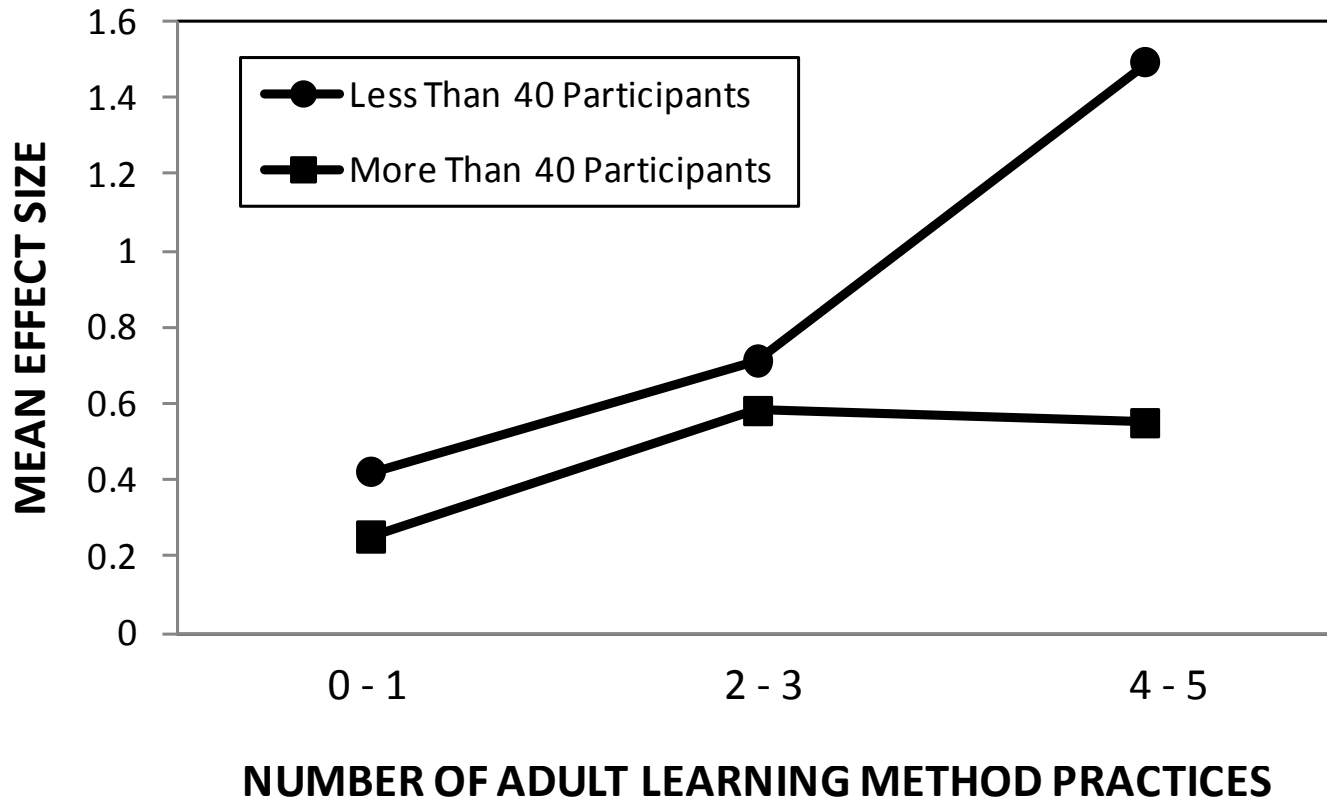
- Hours of Intervention
- Number of Study Participants
- Intervention Setting

The influences of the combined use of the most effective practices and the moderators were evaluated by a series of 3 Between Number of Adult Learning Method Practices (0–1, 2–3, 4–5) X 2 Between Moderator Group Analyses. Median splits of hour of institution and number of learners were used to constitute contrasting groups. Intervention setting involved comparisons between embedded learning vs. nonembedded learning.

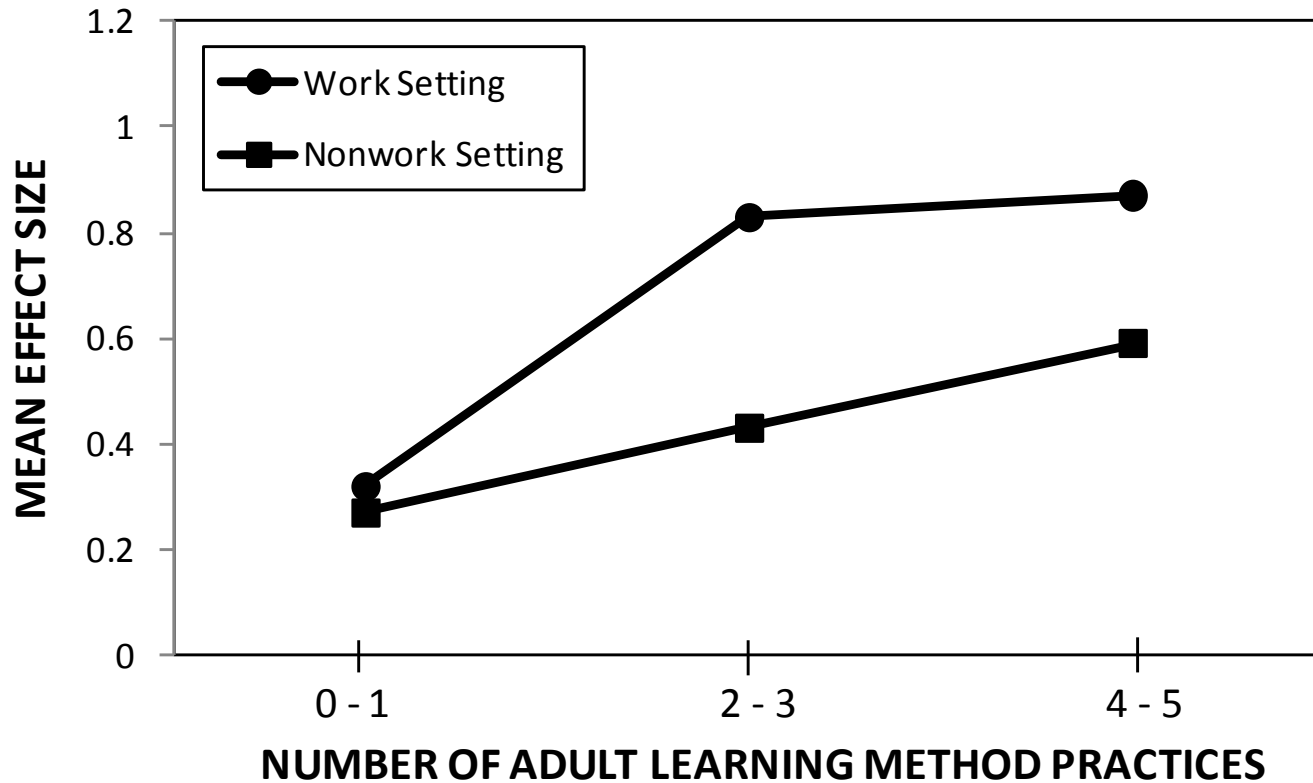
# Relationship Between Different Combinations of Practices and Hours of Instruction



# Relationship Between Different Combinations of Practices and Number of Study Participants



# Relationship Between Different Combinations of Practices and Type of Learner Setting

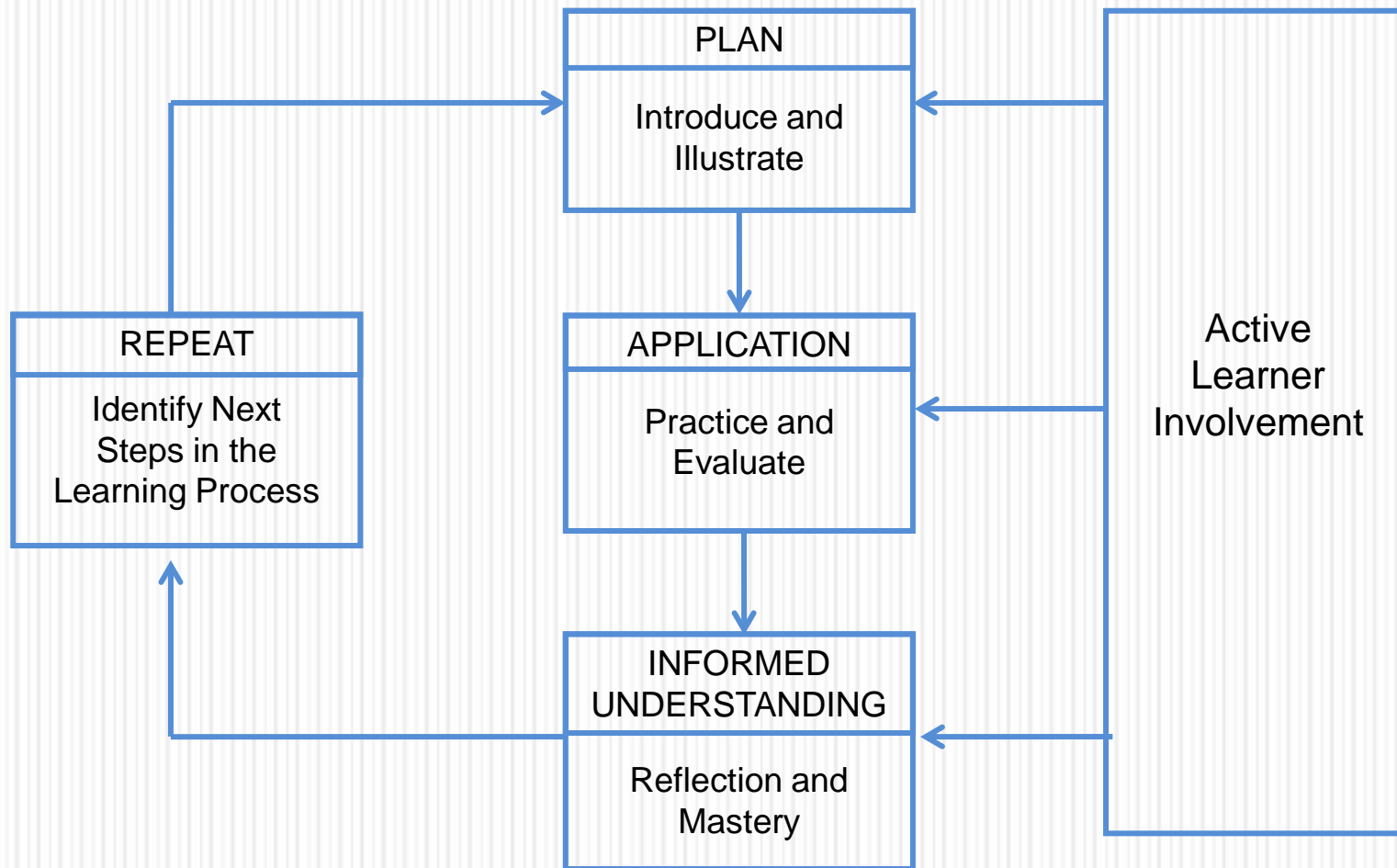


# From Research to Practice

- Findings from the meta-analysis as well as other research and practice using adult learning method practices were used to develop a professional development approach called Participatory Adult Learning Strategy (PALS).
- PALS places primary emphasis on active learner participation in knowledge and skill acquisition and use and instructor/trainer facilitated learner engagement, reflection, and deep understanding of practitioner learning.

# PALS

(*P*articipatory *A*dult *L*earning *S*trategy)





# Trainer and Trainee Roles in the Different Phases of PALS

PALS Phases	Trainer Roles	Trainee Roles
<i>Introduction</i>	<ul style="list-style-type: none"> <li>Preview learning topic</li> <li>Describe key elements</li> <li>Provide examples</li> <li>Include trainee input</li> <li>Illustrate application</li> <li>Demonstrate application</li> </ul>	<ul style="list-style-type: none"> <li>Complete pretraining preview</li> <li>Pre-class/workshop exercises</li> <li>Provide input on the learning topic</li> <li>In-class/workshop warm-up exercises</li> </ul>
<i>Application</i>	<ul style="list-style-type: none"> <li>Facilitate application</li> <li>Observe trainee application</li> <li>Provide <i>in vivo</i> feedback/guidance</li> <li>Facilitate learner assessment of options</li> </ul>	<ul style="list-style-type: none"> <li>Provide examples of application</li> <li>Trainee role playing, games, etc.</li> <li>Implement/practice use of the subject matter</li> <li>Evaluate use of the knowledge or practice</li> </ul>
<i>Informed Understanding</i>	<ul style="list-style-type: none"> <li>Establish learning standards</li> <li>Engage learners in self-assessment</li> <li>Provide guidance to learners</li> <li>Provide behavioral suggestions</li> </ul>	<ul style="list-style-type: none"> <li>Standards-based evaluation</li> <li>Conduct self-assessment</li> <li>Trainer-guided learner reflection</li> <li>Journaling</li> <li>Group discussions of understanding</li> </ul>
<i>Repeat Learning Process</i>	<ul style="list-style-type: none"> <li>Joint planning</li> <li>Trainer guidance</li> <li>Trainer/trainee mentoring</li> </ul>	<ul style="list-style-type: none"> <li>Joint planning</li> <li>Identify needed information/experiences</li> <li>Trainer/trainee mentoring</li> </ul>

## Research and Practice Using PALS for Promoting Practitioner and Parent Use of Evidence-Based Intervention Practices

- Dunst, C. J. (2009). Implications of evidence-based practices for personnel preparation in early childhood intervention. *Infants and Young Children, 22*(1), 44-53.
- Dunst, C. J., & Raab, M. (2010). Practitioners' self-evaluations of contrasting types of professional development. *Journal of Early Intervention, 32*, 239-254.
- Dunst, C. J., Trivette, C. M., & Deal, A. G. (2011). Effects of in-service training on early intervention practitioners' use of family systems intervention practices in the USA. *Professional Development in Education, 37*, 181-196.
- Raab, M., Dunst, C. J., & Trivette, C. M. (2010). Adult learning process for promoting caregiver adoption of everyday child language learning practices: Revised and updated. *Practically Speaking, 2*(1), 1-8.
- Trivette, C. M., Raab, M., & Dunst, C. J. (2012). An evidence-based approach to professional development in Head Start classrooms. *NHSA Dialog, 15*, 41-58.

# Conclusions

- A translational approach to conducting research syntheses yields more information about a practice (intervention, treatment, etc.) that can be used to develop evidence-based interventions compared to either efficacy or efficiency syntheses.
- The yield from a translational research synthesis can identify which characteristics of a practice ***matter most*** in terms of producing desired effects.
- Practitioners who use the practice characteristics that are associated with positive outcomes found in a translational synthesis are using evidence-based practices.

*“Implications of Practice-Based Research Syntheses  
for Early Childhood Intervention Practices”*

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