



# Unit 1 – Current Issues in Early Childhood Education

## Key Topic 3: A Closer Look at the Research on Brain Development

Unit 1: Current Issues in Early Childhood Education  
Key Topic 3 – A Closer Look at the Research on Brain Development

### Focus Statement

Students explore recent research on brain development and its implications for policy and program practice in early childhood education.

### Curriculum Alignment Project (CAP) Student Learning Outcomes

The Curriculum Alignment Project's (CAP) lower division eight courses, CAP expansion courses, and student learning outcomes are mapped onto each instructional guide learning experience. See Appendix A for the specific student learning outcomes, objectives, and examples of course content and topics for the courses listed below.

- Child Growth and Development
- Principles and Practices of Teaching Young Children
- Health, Safety and Nutrition
- Introduction to Children with Special Needs

### Instructional Methodologies

- Class discussion
- Class presentation
- Literature review
- Pairs or small groups
- Peer review and feedback
- Reflective discussion
- Role-playing
- Short paper or report



## California Early Childhood Educator Competency Areas to Consider

These competency areas are from the California Department of Education, Early Education and Support Division's *California Early Childhood Educator Competencies* (CDE 2011). The "Competency Areas to Consider" below are listed in this instructional guide as a preliminary exploration of how particular competency areas might be addressed through these learning experiences.

- Child Development and Learning
- Special Needs and Inclusion
- Health, Safety, and Nutrition
- Leadership in Early Childhood Education



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## Key Topic 3: A Closer Look at the Research on Brain Development

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Key Topic 3 – A Closer Look at the Research on Brain Development

### Before You Start

Information from brain research over the past decades has increased our understanding of early brain development and thereby informed policies and practices around early care and education. In this key topic, students first review the section on “Recent Research on Brain Development” in Chapter 1 of the *California Preschool Program Guidelines*. They are next asked to focus on information highlighted in three boxes in that section:

- The Science of Early Childhood Development (p. 7)
- NIEER Preschool Policy Brief—Connecting Neurons, Concepts, and People: Brain Development and Its Implications (p. 8)
- The Bilingual Brain: What Is Known from Neuroscience (p. 9)

Students then choose an article drawn from one of the references for those boxes and summarize the content through a role-playing experience in which they present key messages to either policymakers or family members. A list of articles is suggested in the “Information Delivery” segment of this key topic. The articles can be accessed through these Web sites:

- Center on the Developing Child, Harvard University:  
[http://developingchild.harvard.edu/resources/briefs/inbrief\\_series/](http://developingchild.harvard.edu/resources/briefs/inbrief_series/) (accessed January 20, 2016)
- National Institute for Early Education Research (NIEER):  
<http://nieer.org/publications/policy-matters-policy-briefs> (accessed January 20, 2016)
- California State Advisory Council on Early Learning and Care and the California Department of Education:  
<http://www.cde.ca.gov/sp/cd/ce/sacresources.asp> (accessed January 20, 2016)

After reviewing the list and these Web sites, faculty may choose to revise the list based on their students’ experience, course objectives, and their own familiarity with the topic.



If students do not have copies of the *California Preschool Program Guidelines*, the Portable Document Format (PDF) version can be downloaded from the California Department of Education Web site at <http://www.cde.ca.gov/sp/cd/re/documents/preschoolproggdlns2015.pdf> (accessed January 20, 2016).

## Information Delivery



Slides 2-3

Students first review the section, “Recent Research on Brain Development,” in Chapter 1 of the *California Preschool Program Guidelines* on pages 6–10. They are then directed to the information found in the following three text boxes in this section:

- The Science of Early Childhood Development (p. 7)

Source: Center on the Developing Child at Harvard University. n.d. InBrief Series: Early Childhood Program Effectiveness. Cambridge, MA: Harvard University.

<http://developingchild.harvard.edu/resources/inbrief-science-of-ecd/> (accessed January 20, 2016)

- NIEER Preschool Policy Brief - Connecting Neurons, Concepts, and People: Brain Development and Its Implications (p. 8)

Source: Thompson, R.A. n.d. “Connecting Neurons, Concepts, and People: Brain Development and Its Implications.” *National Institute for Early Education Research Preschool Policy Facts*.

<http://nieer.org/publications/policy-matters-policy-briefs/policy-brief-connecting-neurons-concepts-and-people-brain> (accessed January 20, 2016)

- The Bilingual Brain: What Is Known from Neuroscience (p. 9)

Source: State Advisory Council on Early Learning and Care. 2013. *California’s Best Practices for Young Dual Language Learners: Research Overview Papers*. Sacramento: California Department of Education.

<http://www.cde.ca.gov/sp/cd/ce/sacresources.asp> (accessed January 20, 2016).

Based on these three references, the following list of articles is suggested for the students to choose from in preparing their role



plays. The InBrief articles are from the Center on the Developing Child, Harvard University. Some of the InBrief articles also are available in Spanish and/or have a video version, as noted for each article. Handout 1, “InBrief Articles from the Center on the Developing Child,” is provided for students’ easy access to these articles.



Slide 4

- InBrief: The Science of Early Childhood Development (Spanish, Video)  
<http://developingchild.harvard.edu/resources/inbrief-science-of-ecd/> (accessed January 20, 2016)
- InBrief: The Impact of Early Adversity on Children’s Development (Spanish, Video)  
<http://developingchild.harvard.edu/resources/inbrief-the-impact-of-early-adversity-on-childrens-development/> (accessed January 20, 2016)
- InBrief: Early Childhood Program Effectiveness (Spanish, Video)  
<http://developingchild.harvard.edu/resources/inbrief-early-childhood-program-effectiveness/> (accessed January 20, 2016)
- InBrief: The Foundations of Lifelong Health (Spanish, Video)  
<http://developingchild.harvard.edu/resources/inbrief-the-foundations-of-lifelong-health/> (accessed January 20, 2016)
- InBrief: Executive Function: Skills for Life and Learning (Spanish, Video)  
<http://developingchild.harvard.edu/resources/inbrief-executive-function/> (accessed January 20, 2016)
- InBrief: Early Childhood Mental Health (Spanish, Video)  
<http://developingchild.harvard.edu/resources/inbrief-early-childhood-mental-health/> (accessed January 20, 2016)
- InBrief: The Science of Neglect (Spanish, Video)  
<http://developingchild.harvard.edu/resources/inbrief-the-science-of-neglect/> (accessed January 20, 2016)
- InBrief: The Science of Resilience (Video)  
<http://developingchild.harvard.edu/resources/inbrief-the-science-of-resilience/> (accessed January 20, 2016)
- National Institute for Early Education Research (NIEER)  
 Preschool Policy Facts: Connecting Neurons, Concepts, and



People: Brain Development and Its Implications

<http://nieer.org/publications/policy-matters-policy-briefs/policy-brief-connecting-neurons-concepts-and-people-brain> (accessed January 20, 2016)

- Paper 1 of *California's Best Practices for Young Dual Language Learners: Research Overview Papers* - Neuroscience Research: How Experience with One or More Languages Affects the Developing Brain (pp. 33–37)  
<http://www.cde.ca.gov/sp/cd/ce/sacresources.asp> (accessed January 20, 2016).

Note that this paper has some fairly technical language and concepts about neuroscience and developmental cognitive neuroscience research. Therefore it is recommended that students review the last five pages of the article (pages 33–37), “Recommendations and Implications for Program Practice.” The content of the text box on page 9 of the *California Preschool Program Guidelines* is taken from these concluding pages.

## Active Learning

### Getting it started

Begin this key topic by asking students to read and discuss the section in Chapter 1 of the *California Preschool Program Guidelines* on “Recent Research on Brain Development” (pages 6–10). The following questions might be used to guide the discussion:



Slide 5

- What words or phrases did you note as particularly interesting?
- What information was new to you?
- Why is it important for preschool teachers to be aware of this research on brain development?

### Keeping it going

Point out the three text boxes in this section of Chapter 1 of the *California Preschool Program Guidelines*:



Slide 6

- The Science of Early Childhood Development (p. 7)
- NIEER Preschool Policy Brief - Connecting Neurons, Concepts, and People: Brain Development and Its Implications (p. 8)
- The Bilingual Brain: What Is Known from Neuroscience (p. 9)



Explain that there is a primary reference for each text box as well as some related articles. Share the suggested list with the students and ask them to form groups of three. Each group is to then select one of the articles from the list and identify the article's key messages and recommendations.



Slide 7

### Taking it further

After students have discussed the reference, they are to role-play a scene in which they are speaking at a meeting of a policymaking body such as a school board or city council. The role playing should include a three-minute presentation followed by a few questions from the board or council members. The students are also to create a one-page fact sheet that they would give to the policymakers prior to their presentation. One student should be the speaker and the others should be the policymakers.

### Putting it together

Provide time for each group to present to the other students. After each presentation, ask the rest of the students to share some feedback—highlights, strengths, and suggestions.

### Another approach

Instead of developing a presentation for policymakers, each group is to develop a short presentation and information sheet for family members. One student can be the

teacher, and the other students can be family members. Ask each group to provide copies of its information sheet for the other students. This compilation can be a resource for students in their work with families.

### Online Options

Many students have access to smartphones with video-recording capability. If there is a student in each group who has this capability, students may post video clips of their role-playing presentations online. After all students have reviewed their classmates' videos, the instructor can facilitate a discussion of the questions in the "Reflection" section either in class or online if there is online-discussion capability. Each question could be a separate discussion thread.



Slide 8

## Reflection

This learning experience can be concluded with a class discussion on these questions:



Slides 9-10

- Which facts from the research briefs do you remember?
- Which ones were the most intriguing to you?



- How did preparing a presentation for policymakers or families help you understand the significance of the research on early brain development?
- What key messages from the research will you remember and apply as a preschool teacher?

This second set of more general reflective questions can be used in this and other key topics for additional class discussion or to guide individual student journaling.



Slides 11-13

- Which ideas or part of this class session stood out most for you?
- What seemed familiar or reinforced what you already know or have experienced? What gave you a new perspective or insight that causes you to think differently about teaching preschool children and/or engaging their families?
- Why do you think the content of this class session was presented the way it was? How did this approach help you understand the content? What else would have helped? What does this tell you about how you learn?
- How will you decide what to apply from this class session in your work with preschool children and families? What will you do to ensure you will implement what you have decided to use?

**Deeper Understanding**

Many of the articles listed in the “Information Delivery” segment are based on more in-depth articles. Students are to select one and write an annotation\* of the article.

Deeper Understanding	
InBrief: Executive Function: Skills for Life and Learning	Building the Brain's "Air Traffic Control" System: How Early Experiences Shape the Development of Executive Function: Working Paper No. 11  <a href="http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/working_papers/wp11/">http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/working_papers/wp11/</a> (accessed January 20, 2016)



	<b>Deeper Understanding</b>
InBrief: The Foundations of Lifelong Health	<p>The Foundations of Lifelong Health Are Built in Early Childhood</p> <p><a href="http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/foundations-of-lifelong-health/">http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/foundations-of-lifelong-health/</a> (accessed January 20, 2016)</p>
InBrief: Early Childhood Mental Health	<p>Establishing a Level Foundation for Life: Mental Health Begins in Early Childhood: Working Paper No. 6</p> <p><a href="http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/working_papers/wp6/">http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/working_papers/wp6/</a> (accessed January 20, 2016)</p>
InBrief: The Science of Neglect	<p>The Science of Neglect: The Persistent Absence of Responsive Care Disrupts the Developing Brain: Working Paper No. 12</p> <p><a href="http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/working_papers/wp12/">http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/working_papers/wp12/</a> (accessed January 20, 2016)</p>
InBrief: The Science of Resilience	<p>Supportive Relationships and Active Skill-Building Strengthen the Foundations of Resilience: Working Paper No. 13</p> <p><a href="http://developingchild.harvard.edu/resources/reports_and_working_papers/working_papers/wp13/">http://developingchild.harvard.edu/resources/reports_and_working_papers/working_papers/wp13/</a> (accessed January 20, 2016)</p>
Preschool Policy Facts: Connecting Neurons, Concepts, and People: Brain Development and Its Implications	<p>NIEER Preschool Policy Brief: Connecting Neurons, Concepts, and People: Brain Development and Its Implications (December 2008, Issue 17)</p> <p><a href="http://nieer.org/publications/policy-matters-policy-briefs/policy-brief-connecting-neurons-concepts-and-people-brain">http://nieer.org/publications/policy-matters-policy-briefs/policy-brief-connecting-neurons-concepts-and-people-brain</a> (accessed January 20, 2016)</p>



	<b>Deeper Understanding</b>
Paper 1 - Neuroscience Research: How Experience with One or More Languages Affects the Developing Brain (pp. 33–37)	Paper 1 - Neuroscience Research: How Experience with One or More Languages Affects the Developing Brain  <a href="http://www.cde.ca.gov/sp/cd/ce/sacresources.asp">http://www.cde.ca.gov/sp/cd/ce/sacresources.asp</a> (accessed January 20, 2016).

The following elements are suggested for the annotation\*:



Slides 14-16

- Full citation for the article
- Summary
  - Main point(s)
  - Topic(s) covered
  - Main argument(s)
- Assessment
  - Goal or purpose of the article
  - Usefulness as a resource
  - Reliability of the information\*\*
- Reflection
  - Applicability of the information to your practice
  - Changes in your thinking or understanding based on the article
  - Recommendation of the article to colleagues

If possible, compile the students’ annotations into a complete bibliography that each student can have as a resource.

\*The annotation elements are based on the description for writing an annotated bibliography from the Purdue Online Writing Lab at <https://owl.english.purdue.edu/owl/resource/614/1/> (accessed January 20, 2016).

\*\*Additional suggestions for evaluating a reading can be found at <https://owl.english.purdue.edu/owl/resource/553/03/> (accessed January 20, 2016).



## InBrief Articles from the Center on the Developing Child

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<http://nieer.org/publications/policy-matters-policy-briefs/policy-brief-connecting-neurons-concepts-and-people-brain> (accessed January 20, 2016)
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