Mapping the field through teaching and research:  
a story about the fourth-grade shift  
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I. Introduction  
A. Liberal arts college  
B. Interdisciplinary mindset, ‘a terrain for taking multiple perspectives’ (Gardner, 2009, p. 69)  
C. Evidence-based approach: child development and learning (e.g., Leibbrand & Watson, 2006; Pomerance, Greenberg, & Walsh, 2016)

II. Teaching: EDUC 50  
A. ‘Foundational’ course  
B. Students  
C. No traditional textbook (Adams, 1990; Moats, 2010)  
D. Fiddling  
E. Fourth-grade shift/slump  
1. reading literature: from ‘learning to read’ to ‘reading to learn’ (Chall, 1983)  
2. education literature: ‘don’t wait until the fourth grade to address the slump’ (Goodwin, 2011)  
3. popular press (Tyre & Springen, 2007)  
4. US federal education law: ‘ensure that every child can read by the end of third grade’ (NCLB)  
5. neuroscience – ?

III. Research: Reading Brains Lab  
A. Brain wave recording – event-related potential (ERP)  
1. derivative of EEG  
2. electrical potential specifically related to some kind of event (e.g., Luck, 2005)  

B. Example

IV. Teaching and Research: The Fourth-Grade Shift  
A. Quick, accurate (automatic) word recognition (Chall & Jacobs, 2003)  
B. Real-time neural word processing  
C. Third, fourth, and fifth graders, and college students – NICHD R03  
   1. five stimulus conditions  
      a. words (bed, bring)  
      b. pseudowords (bem, fring)  
      c. letter strings (mbc, nrfgi)  
      d. false font strings (BEM, FRING)  
      e. animal names (cat, frog)  
   2. N400 (Coch, 2015)  
      a. semantic processing (e.g., Kutas & Hillyard, 1980)  
      b. post-test: 96-99%  
   3. N400 and standardized behavioral measures (Coch & Benoit, 2015)  
      a. 72 late elementary students  
      b. index reading, mostly independently
4. N170 (N1, Coch & Meade, 2016)
   a. automatic orthographic processing (e.g., Brem et al., 2010; Coch & Mitra, 2010)
   b. fine-grained and coarse-grained orthographic tuning
D. No ERP evidence of a fourth-grade shift related to automaticity of single word reading
   1. possibilities — curriculum
      a. educational implications for scaffolding
      b. Common Core (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010)
   2. a long developmental time course for automaticity of single word reading
      a. look adult-like
      b. process vs. product

V. Conclusion
A. Mapping (a tiny piece of) the field through teaching and research
   1. teaching: interdisciplinary from the start
   2. research: questions from education
B. MBE: advancing the field
   1. peer-reviewed articles
   2. talks and PD
   3. students: teachers and researchers

VI. References