There is a growing interest in applying neuroscience findings to educational theory, practice, and policy (Dubinsky, Roehrig, & Varma, 2013). However, educators have few opportunities to learn information about the brain. In the absence of neuroscience literacy, educators’ enthusiasm for neuroscience findings has resulted in the rise of widespread neuromyths.

This study evaluated the effect of an introductory educational psychology (EP) course for enhancing neuroscience literacy and reducing beliefs in neuromyths of pre-service teachers. The research questions were:

1. Is neuroscience literacy enhanced when pre-service teachers take an introductory EP course, and are these changes different for US and Korean pre-service teachers?
2. Is belief in neuromyths reduced when pre-service teachers take an introductory EP course, and are these changes different for US and Korean pre-service teachers?
3. What are prior factors – academic history and information sources for learning about neuroscience research – impact neuroscience literacy and beliefs in neuromyths in US and Korean pre-service teachers?

**METHOD**

Participants
- Elementary pre-service teachers in an introductory EP course
- US = 70 (male = 77%), mostly juniors at UMinn (age = 21.47 y)
- Korea = 50 (male = 13%), all sophomores at SNU (age = 20.86 y)

Participants completed the survey questionnaire twice, at the beginning and end of semester.

Measures
- A survey questionnaire was developed largely from items used in prior studies (Decker et al., 2012; Herculano-Houzel, 2002). It consisted of 60 statements about brain function and its relation to educational practice, 28 of which were correct and 32 incorrect (Ironsbach’s alpha > .71)

Participates judged each statement as correct (“Yes”), incorrect (“No”), or “I don’t know”. We also collected background information such as age, gender, academic history (i.e., number of biology and neuroscience courses taken).

**Neuroscience Literacy (NL)**
- Neuroscience concepts (NC): know the basic terminology and functions of the brain
- Neuroscience processes (NP): understand how neuroscientists study the brain and produce neuroscience data
- Neuroscience situations (NS): apply neuroscience findings to optimize brain function and development to address authentic real-world problems

Neuromyths (NM)
- Misconceptions generated by misinterpretations to make a case for use of brain research in education and other contexts.

**RESULTS**

1. Two-way repeated ANOVA found a main effect of Time (F(1,118) = 45.223, p < .001, η² = .277), a main effect of Country (F(1,118) = 7.813, p = .006, η² = .062), and a Time-by-Country interaction (F(1,118) = 7.159, p = .008, η² = .057) (see Figure 1). Separate two-way ANOVAs for the six section scores were represented below (see Table 1).

2. Eleven neuromyths were believed by over 50% of US or Korean pre-service teachers at pre-test (see Table 2). Two-way repeated ANOVA only found a main effect of country (F(1,118) = 13.078, p < .001, η² = .100). There was no main effect of time (p = .104) and Time-by-Country interaction (p = .758) (see Figure 2).

**DISCUSSION**

This study evaluated whether an instructional intervention – taking an introductory EP course – increases NL and decreases beliefs in NM. With respect to our three research questions, we found:

1. The introductory EP course increased NL in five of six domains, with the largest improvement in knowledge of brain development. The course directly targets the three components of NL:
   - NC: providing basic knowledge about cognitive development and the brain.
   - NP: introducing an interpretation of student performance.
   - NS: illuminating how psychological theories improve learning and instruction.

2. Taking an introductory EP course did not reduce beliefs in NM. However, a closer examination of the data revealed three classes of NM depending on their persistence. An introductory EP course was not a powerful enough interventions to dispel all NM.
   - Discredited NM: believed in the past but no longer (e.g. Mozart effect)
   - Persistent NM: believed in the past and continue to be believed today (e.g. Brain Gym)
   - Emerging NM: not measured in prior studies but found to be widely believed (e.g. Blind people have better hearing)

3. With respect to moderating factors, information sources from which participants learned about neuroscience findings had a marginal effect of NL, whereas prior coursework had not affected NL and beliefs in NM. These findings imply that merely knowing the relevant science is not enough to translate neuroscience findings into educational practice.

These findings suggest that an introductory educational psychology course provides another interdisciplinary ground for bridging educators and neuroscientists by providing a learning opportunity for improving pre-service teachers’ understandings about the brain.