

**HU805 COGNITIVE AND INTERPERSONAL UNDERPINNINGS OF TEACHING 4-0-0-4****Course Background**

Teaching is one of Nature's remarkable inventions. It is thought to be partially responsible for cumulative culture which is unique to humans.

Of teaching's many parts, two especially important ones are cognitive and altruistic.

The cognitive part of teaching deals with the dynamic, bidirectional transfer of information from the teacher to the learner and back again, and addresses what the teacher knows about the learner's mind when passing on information, as well as what the learner knows so that he can receive and construct that information. Research indicates that, despite teaching's enormous complexity, toddlers appear to have a natural cognitive ability to teach.

An often neglected part of teaching concerns how it forges interpersonal and emotional bonds between people and may foster connections of friendship, compassion and altruism. Toddlers seem to have a natural tendency to behave altruistically. Teaching may be a form of communication that hones emotional connections and altruism.

**Course Goals**

The course will give students a broad view of the cognition of teaching and its interpersonal, emotional and altruistic underpinnings. The course will experimentally study different components of teaching via various means of data collection. These components will include: what is said in communication by the teacher and the learner as teaching and learning occurs, mutual eye contact, synchrony (or its lack) of gestures and body positioning, ostensive communication, mutual emotions-reading and more.

Although all of these are part of teaching, to date there has been no research studying them in the context of teaching. Much of the data collection will be done with technologies that, until now, have not been used for teaching.

The research that will be conducted is part of the larger area of research in the social sciences and the course can be seen as extending beyond the area of teaching.

**Course Schedule**

The course will take place over a 12-day period with each day being 3 hours in time. The 12-day period will be divided into two 6-day periods.

The first 6-day period will be divided into two parts. In the first part, we will: (1) read and discuss assigned articles and (2) plan research projects for the groups that will be studying various components of teaching (eye contact, body position, gestures, emotions-reading, etc.).

There will be a break of approximately one month between the first and second 6-day periods during which the various research groups will conduct preliminary research studies in coordination with the course teacher through email and skype.

In the second 6-day period the various studies will be discussed in class, further studies will be conducted leading to more refined research projects.

It is important to reiterate that the research projects will be innovative in that the various components have never been studied in teaching interactions.

### **Student Assignments**

Students will:

- (1) read articles and participate in classroom discussions on the cognition and altruism of teaching,
- (2) video an adult tutoring another adult (one on one), an adult tutoring a child and a child tutoring another child,
- (3) analyze various areas of tutoring, mentioned in the course goals, found in the videos,
- (4) conduct a study measuring the various components of teaching with each research group working on one of them, and
- (5) write a paper on their findings.

### **Bibliography**

**Initial readings. Each group will read more literature, depending on their choice of teaching component.**

#### The Development of Children's Teaching: Cognition

Strauss, S., & Ziv, M. (2012). Teaching is a natural cognitive ability among humans. *Mind, Brain and Education*, 6(4), 186-196. doi: 10.1111/j1751-228X.2012.01156.x

Calero, C. I., Zylberberg, A., Ais, J., Semelman, M., & Sigman, M. (2015). Young children are natural pedagogues. *Cognitive Development*, 35, 65–78.

#### The Development of Children's Altruism

Warneken, F., & Tomasello, M. (2006) Altruistic helping in human infants and young chimpanzees. *Science*, 311, 1301. doi: 10.1126/science.1121448

Warneken, F., & Tomasello, M. (2009). Varieties of altruism in children and chimpanzees. *Trends in Cognitive Sciences*, 13(9), 397-402. doi:10.1016/j.tics.2009.06.008

### Teaching and Altruism

Strauss, S. (2017). Teaching's potential to create harmony among people. In Battro, A., Lena, P., Sorondo, M. S. & von Braun, J. (Eds.). *Children and sustainable development: A challenge for education*. (pp. 273-282). Heidelberg: Springer Verlag. doi: 10.1007/98-3-319-47130-3

### AI: Humans Teaching Robots

Vollmer A-L., Muhlig, M., Steil, J. J., Pitsch, K., Fritsch, J., et al. (2014). Robots show us how to teach them: Feedback from robots shapes tutoring behavior during action learning. *PLoS ONE* 9(3): e91349. doi:10.1371/journal.pone.0091349

Thomaz, A. L., & Breazeal, C. (2008). Teachable robots: Understanding human teaching behavior to build more effective robot learners. *Artificial Intelligence*, 172(6-7), 716-737. doi: 10.1016/j.artint.2007.09.009

### Teaching and Cumulative Culture

Caldwell, C. A., Renner, E., & Atkinson, M. (2017). Human teaching and cumulative cultural evolution. *Review of Philosophy and Psychology*. doi: 10.1007/s13164-017-0364-3