12 Doctoral positions at the Munich Center of the Learning Sciences
(Ludwig-Maximilians-University of Munich)

The Munich Center of the Learning Sciences (http://www.en.mcls.uni-muenchen.de/) invites applications for 12 Ph.D. scholarships (equalling 2/3 of a full academic position, basic gross salary: 26,420.98 €/year; duration: not more than 36 months) within the International Graduate Program “Scientific Reasoning and Argumentation” (REASON), funded by the Elite Network Bavaria (Elitenetzwerk Bayern; https://www.elitenetzwerk.bayern.de), to commence in October 2013.

Program description
The International Graduate Program “Scientific Reasoning and Argumentation” is an international and interdisciplinary Ph.D. program, with Faculty from Educational and Developmental Psychology, Biology Education, Medical Education, Mathematics Education and Computer Science. It aims to advance scientific knowledge on the development and promotion of reasoning and argumentation skills in science and mathematics from preschool age to adulthood. The research foci include (1) the domain-specificity of scientific reasoning and argumentation, (2) the cognition-emotion interface and how it affects scientific reasoning and argumentation, (3) the role of social context in scientific reasoning and argumentation, and (4) the advancement of scientific reasoning and argumentation skills through (computer supported) collaborative learning.

Domain-specificity of scientific reasoning and argumentation

Scientific reasoning and argumentation skills have traditionally been conceived as domain-general key competencies that underlie learning and problem-solving processes across all knowledge domains and educational levels, from pre-school education to primary, secondary and tertiary education. More recently, however, the Learning Sciences have increasingly focused on the acquisition of domain-specific conceptual knowledge and reasoning practices (e.g., in Biology, Medicine, Mathematics). Therefore, several Ph.D. projects will address the interplay of domain-general and domain-specific reasoning and argumentation competencies on different educational levels.

The cognition-emotion interface

A wealth of research points to the importance of emotional traits, states and processes for learning. However, only recently, research has begun to address the emotions that accompany processes of knowledge generation and acquisition, that is, epistemic emotions (such as curiosity when being confronted with a science problem or anxiety when receiving counterarguments to one’s own arguments). Research on epistemic emotions is one possible topic for Ph.D. projects investigating the cognition-emotion interface in scientific reasoning.

The role of social context in scientific reasoning and argumentation

To participate in societal debates about scientific problems and phenomena, individuals need scientific reasoning and argumentation skills. Thus, scientific reasoning and argumentation is situated in a social context. This social context may be shaped in such a way that evidence evaluation or coordinating theory is effectively supported. For example, research on
(computer-supported) collaborative learning looks at how scientific reasoning and argumentation can be supported by forming small groups of learners or by structuring classroom interaction. Research on formative assessment examines the role of feedback (self, peer, expert). By engaging in reasoning and argumentation within a broader social context, students may acquire general reasoning and argumentation skills as well as domain-specific knowledge about the science subject at hand. Therefore, several Ph.D. projects will investigate how collaborative learning in groups of varying sizes may foster scientific reasoning and argumentation as well as content learning.

**Fostering scientific reasoning and argumentation skills (with and without technology)**

One crucial question for educational institutions at all levels is how to foster the acquisition of scientific reasoning and argumentation skills. Recent research (e.g., on inquiry learning or computer-supported collaborative learning) has identified the strong potential of digital technologies to support the acquisition of such skills. However, less technology-intense environments may also be designed in a way that is conducive to the development of skills related to scientific reasoning and argumentation. Therefore, several Ph.D. projects will deal with the question how scientific reasoning and argumentation can be fostered with and without digital technologies.

Prospective doctoral students will carry out scientific research, in particular using empirical methods, on one or more of these topics (for more information, see [http://www.en.mcls.lmu.de/reason/index.html](http://www.en.mcls.lmu.de/reason/index.html)) in an international, interdisciplinary and supportive environment that brings together expert researchers from Educational Psychology, Developmental Psychology, Emotion Research, Biology Education, Mathematics Education, Medical Education, and Computer Science from the Ludwig-Maximilians University of Munich (LMU) as well as from Social Work from the Katholische Stiftungsfachhochschule München, University of Applied Sciences (KSFH). International experts from these fields will act as additional supervisors and potential hosts for research stays abroad. The program offers a structured curriculum that will help Doctoral students to acquire knowledge and skills related to research methodology, both for the Learning Sciences in general and for studying scientific reasoning and argumentation in particular. The program also offers training opportunities for “soft skills” development and includes a mentoring system that will provide support for students coming from abroad on problems related to academia and everyday life in Germany.

**Requirements and documents**

Candidates are qualified to enter Doctoral level studies according to LMU regulations and must have obtained an excellent Bachelor’s or Master’s degree, or equivalent, in a field related to the Learning Sciences. Related disciplines comprise, but are not limited to Psychology, Education, Science/Technology/Engineering/Mathematics Education, Medical Education, Computer Science and Social Work. Also candidates with degrees from academic teacher educations programmes are eligible. The program is planned to include a “fast track” option that offers the opportunity to combine studies at the Master’s and the Doctoral level. All applicants are required to display a strong interest in research related to the Learning Sciences, and to scientific reasoning and argumentation in particular, either in primary, secondary or tertiary education. Further, each Doctoral student will be required to teach one course per year in the international Master’s program in the Learning Sciences
Applicants are required to submit the following documents to be considered for acceptance into the program:

- Curriculum Vitae
- Letter of motivation, consisting of:
  - a description of prior experience and knowledge related to scientific reasoning and argumentation and empirical research in the Learning Sciences
  - an explanation of specific qualifications for one or several of the project descriptions that can be found on http://www.en.mcls.lmu.de/reason/index.html
- Notarized copies of Diploma and Transcript of records
- Letters of recommendation from two researchers from disciplines associated with the Learning Sciences who hold at least a doctoral degree
- 400-word description of the envisioned research project related to one or several of the areas related to „Scientific Reasoning and Argumentation” that are mentioned above
- Proof of English proficiency (TOEFL > 550 points or equivalent proof)

Based on these documents, promising candidates will be invited to a job interview during which they are asked to present and discuss both their prior research as well as plans for their Ph.D. project (if necessary, presentation can be done by videoconferencing).

**Deadlines, Dates and contact**

For applicants from the Katholische Stiftungsfachhochschule following dates are relevant:

**May 15, 2013:** Deadline for submitting applications including all required documents. Please contact Prof. Dr. Birgit Dorner and Prof. Dr. Sabine Pankofer, E-Mail: promotion@ksfh.de

**June 01 – June 15, 2013:** Selection of possible candidates by the Selection Committee

**June 24 – July 05, 2013:** Job interviews

**October 01, 2013:** Start of program