

# Learning Sciences Specialization Area within the Educational Psychology Ph.D. Program

Learning Sciences is an interdisciplinary field that draws on multiple theoretical perspectives and research paradigms from the human sciences. Researchers in the Learning Sciences attempt to understand the nature and conditions of learning, cognition, development, and related areas of human performance. They investigate cognition in its material, social, and cultural context but with the broad goal of conducting both laboratory-based and naturalistic investigations. The intent of this research is to develop evidence-based claims about how people learn that have practical, pedagogical, and theoretical implications. Given this joint focus on theory and practice and on learning in context, learning sciences research frequently involves carrying out design, implementation, and policy work intended to improve the learning experience of all learners.

The Learning Sciences Program at Indiana University is particularly committed to understanding and improving P-16 learning with an emphasis on building and researching environments, such as mathematics and science classrooms and laboratories, which are frequently technology-enhanced. In addition, we recognize the opportunities of informal learning contexts such as after-school centers, museums, and home environments as well as the growing importance of more formal adult education and corporate training settings. We are dedicated to the preparation of future researchers, instructional developers, and practitioners who will advance our scientific understanding of the teaching and learning process.

Learning sciences is a new field and our program is at the forefront of efforts to develop and train both researchers and practitioners in an innovative apprenticeship model. This PhD specialization program focuses on supporting practitioners in integrating learning sciences principles as part of their professional practice. It will also eventually also include a minor in college pedagogy offered campus wide for graduate students preparing to become faculty members or to work within post-secondary learning environments.

## **PROGRAM DESCRIPTION**

While the Learning Sciences PhD program area does involve the completion of course work, it also involves applying knowledge and skills to address real-world issues, participating in an apprenticeship, building a portfolio, teaching courses, submitting grants and articles for publication. Below, we describe the program experience in terms of:

- *Program Competencies* (expected outcomes),
- *Program Characteristics* (underlying attributes),
- *Program Benchmarks* (rites of passage), and
- *Program Requirements* (credit hours).

## I. Program Competencies

What follows is a list of the competencies that students would be expected to develop through our learning sciences program. The assumption is that these skills are developed as part of course work, in the research lab or in the field, and in association with the student's mentor.

- Take an interdisciplinary perspective on important issues, applying relevant educational psychology, social science theory, cognitive sciences, and educational design theory and research.
- Establish and defend a personal research agenda that is grounded in the foundational assumptions of the learning sciences.
- Prepare a research grant proposal that responds to the research agendas of governmental agencies and foundations that advances the learning sciences.
- Apply research methods to critically inquire into claims about teaching and learning.
- Determine and conduct proper analyses for complex data sets derived from authentic contexts.
- Present research in written and oral form to effectively communicate to various publics the rigor, merit, and usefulness of the research.
- Design and develop learning environments to reflect and advance theory.
- Integrate the principles of the learning sciences within authentic instructional contexts.
- Effectively participate as a member of an interdisciplinary, collaborative research team.
- Adopt an action orientation or disposition that treats service work as an important component of one's professional agenda.

## II. Program Characteristics

*1. Community of Practice:* The learning sciences program is committed to fostering a sense of community as students participate in numerous formal and informal collaborations. Students participate in a pro-seminar where faculty and student colleagues present their work; in research groups for extended periods of time, moving from novice apprentice to core member; in annual cross-departmental conference, critiquing colleagues and over time presenting their own work; in working circles, being responsible for critiquing three articles from colleagues annually and contributing one's own work at least twice during matriculation; and with cognitive science faculty, real-world practitioners, context experts, and other students to understand, implement, and advance learning science principles with respect to real-world problems.

*2. Apprenticeship Learning:* During the first semester students will serve as a participant in three different research groups, gaining an appreciation for the work of each of these groups and at the end preparing an analysis that compares the different types of research being conducted within each group. Each of the next three semesters the student will work with one

research group, moving from peripheral member to core participant with the outcomes of building a portfolio of their contributions, collaborating on grant proposals, and serving as a co-author and finally lead author on submitted manuscripts.

*3. Interdisciplinary Inquiry:* Our program is part of a larger university effort in cognitive science. It is our belief that learning science problems are often solved through such interdisciplinary collaborations. Therefore,; we actively seek association with scholars in disciplines with concerns similar to our own; we are active in adjacent literature looking for conceptual and methodological inspiration; we seek organizational liaisons for cross disciplinary dialogue and we improve our research potential through criticism of our work in an atmosphere of constructive criticism by talented multidisciplinary scholars. In addition to becoming part of and contributing to this interdisciplinary research and development, students will complete foundations courses designed to help them gain the knowledge and skills associated with being a successful learning scientist. These include core classes and seminars in educational psychology, instructional design, and cognitive science more generally.

### III. Program Benchmarks

It is our belief that students in the Learning Sciences program will have outstanding academic potential, become independent thinkers, be remarkably competitive in the academic and other research environments, and be accomplished as they leave with substantial research experience and related publications. The following are program benchmarks in support of these goals and program competencies.

**Entry:** High GRE's, excellent undergrad record (similar if has Masters), some research experience (more so if has Masters), a personal essay that reflects a sincere and articulate interest in the learning sciences, references that provide thoughtful evidence for our criteria, and a sterling personal interview.

**First year review:** Each student will prepare an individual degree and research plan, which in conjunction with a sample of work, will be used as a review of student progress.

**Second year review:** By the end of the second year, those students who entered with only an undergraduate will write their thesis and receive an MS. The public defense of the thesis will serve as a second year review.

**Third year review:** Student will take a comprehensive examination on conceptual issues related to design, measurement, and statistics. Students will also have a brief oral defense in which they defend their research agenda and theoretical perspective in front of an interdisciplinary committee.

**Nomination to candidacy:** Nomination to candidacy must occur before one's dissertation commences. Students must pass a review of a portfolio and a public presentation in the pro seminar. Student will also complete one multiple-authored publication and one other first-authored publication submitted to a peer-reviewed journal.

**Dissertation:** Dissertations can be either the standard dissertation or a collection of articles taken together make a comprehensive point that contributes meaningfully to the field. The latter criteria helps us move forward dissertations that are closer to publishable 'as is.'

## IV. Program Requirements

- Foundations (theory, philosophy of science) (15 credits)
- Inquiry (research methods, inquiry) (15 credits)
- Major (research apprenticeship, topical seminars, pro-seminars) (33 credits)
- Minor (minor) (12 credits)
- Dissertation Credits (dissertation) (15 credits)

Requirements	Fal	Spr	Sum	
<u>1<sup>st</sup> Year</u>				
Major Pro seminar	1	1		
Major Research Apprenticeship I	3	3		
Foundations & Inquiry	6	3	3	
Minor/Elective		3	3	
				26 hours
P571 Proseminar in Learning Sciences P572 Theory and Method in Learning Sciences (foundation) P573 Learning Science Apprenticeship I F500 Applied Cognition and Learning (foundation) JXX Curriculum Theory (foundation) Y502 Intermediate Statistics applied to Education (inquiry) XXX Minor/Electives				
<u>2<sup>nd</sup> Year</u>				
Major Pro seminar	1	1		
Major Research Apprenticeship II	3	3		
Foundations & Inquiry	6	3	3	
Advanced Major Class		3		
Minor/Elective			3	
				26 hours
Q533 Brain & Cognition (foundation) HXX Philosophy/History of Education (foundation) Y603 Statistical Design of Educational Research (inquiry) Y611 Qualitative Inquiry in Education (inquiry) P574 Topical Seminar in Learning Sciences (major)				
<u>3<sup>rd</sup> Year</u>				
Major Pro seminar		0		
Major Research Apprenticeship III	3	3	2	
Advanced Major Classes	3	3		
Inquiry	3			
Minor Elective		3		
Proposal Prep		33		
				23 hours
Y527 Educational Assessment and Psychological Mesmt (inquiry) P574 Topical Seminar (major) Y604 Multivariate Analysis in Educational Research (inquiry) XXX Minor Elective (minor)				
<u>4<sup>th</sup> Year</u>				
Pro seminar	0*	0*		
Major Research Apprenticeship		3		
Dissertation	6	6		
				15 hours
				<b>Total: 90 hours</b>