

Learning Sciences and Educational Psychology (LSEP) Program Handbook

Department of Psychological and Quantitative Foundations
College of Education
University of Iowa

Updated: Fall 2025

Preface

The materials contained in this handbook were assembled from various sources for the convenience of present and prospective graduate students in the Learning Sciences and Educational Psychology (LSEP) program. This handbook is not an official publication of The University of Iowa and in case of conflict is superseded by the [Manual of Rules and Regulations of the Graduate College](#). All program faculty members have a copy of this manual. Certain program requirements are legitimately more stringent than those of the Graduate College and do not constitute a conflict.

These policies are considered binding only within the LSEP program of the College of Education and can be revised at any time by action of the Learning Sciences and Educational Psychology faculty. The remaining policies are those of the College of Education of The University of Iowa and are taken from various official University publications. A student's program is governed by the regulations operative on the date of the student's initial matriculation, unless the student chooses to be regulated by policies adopted subsequently.

August 22, 2025

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Program Overview

The Learning Sciences and Educational Psychology program at the University of Iowa offers an MA and PhD to students interested in understanding and shaping learning in a number of settings – schools, workplaces, higher education, museums, etc. The program provides opportunities for engaging with research and considering how research can best influence instructional practices and student outcomes. While the program of studies for these two degrees share a number of courses, each propels students enrolled to different goals. Students completing the master’s degree are prepared to apply the findings of learning sciences research to solve problems in a broad range of educational contexts. The doctoral degree draws further on the theories and practices that are grounded in educational psychology and the learning sciences. The doctoral degree encourages and helps students acquire the depth of knowledge and sophistication of methodology necessary for original research contributions in those fields. Neither of these degrees leads to licensure.

The backbone of both degrees is the theoretical and empirical exploration and application of what it means to learn in varied contexts. The goal of the PhD in Learning Sciences and Educational Psychology is to prepare students for careers as scholars and educational professionals in the learning sciences and related disciplines. For many students, this means employment as faculty members in universities and colleges, for others it means work as researchers and practitioners in government education agencies, school districts, educational measurement institutions, hospitals, private firms, and other settings in which education and training takes place. Likewise, our MA in the Learning Sciences prepares the future workforce in a diverse range of instructional design and educational venues such as educational publishing companies, assessment and learning companies, the healthcare industry, and companies and industries that have their own training programs.

While our adoption of the Learning Sciences as a focus to our program is relatively new (2015), our Educational Psychology program, and our former Instructional Design and Technology Program that merged with Educational Psychology in 2003, have a long history at the University of Iowa. While we do not have an actual date for the start of the Educational Psychology program, we do know that Albert Hieronymus (faculty from 1949-1987) was a member of the EP faculty (see <https://education.uiowa.edu/news/celebrating-al-hieronymus-legacy>). Our EP faculty have contributed to the field through research in a variety of areas related to learning, cognition, assessment, development, motivation, learning technologies, and instruction. A number of our EP faculty moved into administrative roles during their tenure at the University of Iowa. The Instructional Design and Technology program dates back at least to the time of Lowell Schoer, who had a joint appointment in Educational Psychology (faculty from 1961-1998). Barry Bratton (faculty from 1976 to 1997) was instrumental in the development of professional standards and competencies to define the field of instructional design. Faculty in the program added to the scholarship in areas of instructional design and performance improvement, the intersection of cognition and instruction, and the use of technology for educational purposes. These program areas provide a strong legacy and foundation for our current program in Learning Sciences and Educational Psychology.

Our Faculty

Our faculty have been trained at a variety of top programs throughout the country and they bring a diverse collection of ideas and skills to our Learning Sciences and Educational Psychology program. In their research and teaching, they combine foundational knowledge from cognitive science with innovative theories, methods, and design principles from the Learning Sciences. People learn in diverse contexts and our faculty respond to this diversity by investigating how people at different ages, from childhood through adult, learn across formal and informal spaces. Studying the diversity of learners demands a diversity of approaches. Our faculty therefore investigate how people learn by analyzing the dynamic and interactive processes that individuals and groups display when thinking, representing, and sharing knowledge. These approaches identify critical activities that promote learners' understanding and participation across a variety of disciplines that include areas of science, technology, engineering, and mathematics, as well as the arts, humanities, and social sciences.

Mitchell Kelly, PhD (University of Iowa)

Clinical Professor, Program Admissions Coordinator, Director of The Office of Graduate Teaching Excellence

Contact: mitchell-kelly@uiowa.edu

Mitch Kelly is the Director of the Office of Graduate Teaching Excellence and guides graduate students across campus in earning the Graduate College Certificate in College Teaching. He was received multiple teaching awards throughout his career at The University of Iowa.

Matthew Lira, PhD (University of Illinois - Chicago)

Assistant Professor

Contact: matthew-lira@uiowa.edu

Matthew Lira's research combines three intersecting lines of inquiry – conceptual change, representational competence, and epistemological growth. He situates his work at the undergraduate level where he focuses on when and how biology intersects with other STEM disciplines (e.g., mathematics). Of particular interest to him is how mathematical knowledge and representations might serve as mediators and resources for students learning in biology as opposed to these elements serving as barriers to learning.

Duhita Mahatmya, PhD (Iowa State University)

Assistant Professor

Contact: duhita-mahatmya@uiowa.edu

Duhita Mahatmya uses an ecological systems framework and mixed methods to examine youth academic and social development across family, school, and community contexts. She has also served as a research methodologist on several federally funded grants focused on creating school-based social-emotional interventions. Broadly, her research explores how the environments we live and learn in and relationships we have shape positive youth development and well-being.

Kay Ramey, PhD (Northwestern University)

Assistant Professor

Contact: kay-ramey@uiowa.edu

Kay Ramey's research examines how young people organize their own learning and how to design spaces and activities that allow equitable access for them to do so. Most of this research has been conducted in the context of STEAM activities and maker spaces, drawing on my own personal background in the arts. One line of her work investigates interest development and the role of interest in learning. This includes how interest-driven learning supports the development of 21st century skills, how young people pursue interests and learning across contextual boundaries, and how interest-driven learning environments might be designed to support equitable engagement. A second line of work examines how young people organize and make use of social and material resources to make sense of spatial phenomena in the context of STEAM learning activities. And a third line examines how educators make sense of and adapt innovative STEAM programming to meet their needs and the needs of their students.

Kathy Schuh, PhD (Indiana University - Bloomington)

Professor, LSEP Program Coordinator, Coordinator of Certificate in Online Teaching;
Director Education Studies and Human Relations

Contact: kathy-schuh@uiowa.edu

Kathy Schuh's research interests include exploring the relationships among epistemology, learning theory, and instructional practice with a primary interest in contemporary views of learning such as socio-cultural constructivism and situated cognition. She has studied the importance of students' making links between information they encounter in their classrooms and their personal experiences as part of their meaning-making processes. Her current work expands on this meaning-making perspective by looking at how potential experiential and psychological obstacles to learning may contribute to students' perceptions of their own learning-related characteristics. Her publications include a book, *Making Meaning by Making Connections* (2017), wherein she synthesizes a decade of research on the links that late-elementary students made between content they encountered in their classrooms and their prior experiences.

Gahyun Callie Sung, PhD (Harvard University)

Assistant Professor

Contact: gcsung@uiowa.edu

Callie Sung's research uses computational and mixed methods to paint the student experience in STEM education with data – particularly for struggling novice programmers. Her interests lie in bringing in perspectives of socio-emotional learning and well-being to the often grueling environment of the STEM classroom, and to the field of learning analytics. Methodologically, she is invested in refining and developing scalable, non-invasive ways of ecological data collection with sensors (e.g., cameras, wearables), and in using generative and other forms of AI to design affect-aware interventions in the classroom.

Affiliated Faculty

Our affiliated faculty are instrumental in our program as they foster the multi-disciplinary lens that is important in the study for learning. These faculty offer courses in which our Educational

Psychology / Learning Sciences students may enroll, serve of comprehensive examination and dissertation committees, and may provide practicum research opportunities for our students.

Anne Estapa, PhD (University of Missouri)

Assistant Professor, Mathematics Education

Office: 1-319-335-5118, anne-estapa@uiowa.edu

Anne Estapa is an Assistant Professor of Mathematics Education in the Department of Teaching and Learning. Her research interests focus on teacher learning, specifically how to support and develop the knowledge of and practice for teaching within and across contexts. She utilizes technology as a tool to develop opportunities and experiences that approximate the practice of teaching and support learning with an ultimate goal of mathematical access for students.

Eric Freedman, PhD (University of Wisconsin - Madison)

Assistant Professor, Social Studies Education

Office: 1-319-467-1615, eric-freedman@uiowa.edu

Eric Freedman is an Assistant Professor of Social Studies Education in the Department of Teaching and Learning. A former high school history and government teacher, he teaches courses in elementary and secondary social studies instructional methods. His research explores the design of socially transformative curriculum in history. It examines ways to position students to ask of historical narratives, not only “Does it align with the evidence?” but also “Whose experiences does it highlight or ignore? Whose interests does it serve?” He has also developed methods of charting students’ engagement in historical discussions.

Adjunct Faculty

In addition to our clinical and tenure-track faculty, at times we appoint adjunct professors who have expertise in particular curricular areas so that we may offer courses related to that content in a particular semester. The adjuncts are highly regarded given their experience in a particular content area or with a particular group of learners and their appointment is voted on by the departmental faculty.

Patricia Bahr, MSE (University of Iowa)

Adjunct Professor, Learning Sciences and Educational Psychology

Patricia Bahr has a BS in biomedical and an MSE in biomechanical engineering. After working with people with disabilities and assistive technology for over 30 years, she received the RESNA Fellow Award in July 2021. She is currently a program manager at the University Center for Excellence in Developmental Disabilities and co-chair for the University of Iowa’s Council for Disability Awareness. She is former director of the Iowa Center for Assistive Technology Education and Research in the College of Education. She worked for 24 years at Gillette Children’s Specialty Healthcare in St. Paul, MN as a rehabilitation engineer and supervisor of the Mobile Outreach Clinic. Research interests include teaching people with intellectual disabilities to use assistive technology and the incorporation of universal design into school and work environments. She is also involved with the intersectionality of disability and other diverse populations.

Elizabeth Brown, PhD (University of Iowa)

Adjunct Professor, Learning Sciences and Educational Psychology

Elizabeth (Beth) Brown has a BM in Vocal Performance and Music Education and a PhD in Educational Psychology with an emphasis on developmental science. She teaches graduate and undergraduate courses in instructional design, cognitive learning theories, and human development. She has developed music curriculum for children ages 3-17, teaching music for twenty years in the Iowa City Community School District (ICCS) pre-k to high school. She serves as the Internal Coach for Positive Behavior Interventions and Supports at Longfellow Elementary School. Beth is the Curriculum and Personnel Director at Nolte Companies, supporting 30-plus arts faculty in a variety of arts education programs. She directs Iowa City Youth Choir, Nolte Nutcracker Chorus, and is a founder and former director of the Performing Arts Preschool at Nolte Academy.

Jay Gorsh, PhD (University of Iowa)

Adjunct Professor, Learning Sciences and Educational Psychology

Jay Gorsh earned his PhD in Special Education where his research focused on science instruction for students with high incident disabilities. He is currently director of the School of the Wild, a statewide initiative to increase outdoor learning experiences for elementary and middle school students across Iowa. In his work he trains formal and informal educators to work collaboratively to develop and implement School of the Wild programs. School of the Wild is a place-based 4-5-day interdisciplinary experience. The program is conducted in local parks by local educators. Students engage in authentic learning experiences to gain a better understanding of natural resources, conservation, wildlife, outdoor recreation, careers, and their connection to the natural world. His research focuses on best practices in outdoor education as well as the benefits of immersive outdoor learning experiences for students and educators.

Sara Nasrollahian Mojarad, PhD (University of Tennessee, Knoxville)

Adjunct Professor, Learning Sciences and Educational Psychology

Sara received her PhD in Educational Psychology and Research with an emphasis on Adult Learning in which she conducted a narrative study to explore immigrant adult learners' learning and educational experiences. Her research interest to explore the potential to promote equitable pedagogy has been nurtured through her involvement in Transparency in Learning and Teaching research study. Sara is an assistant director at the Office of Teaching, Learning, and Technology Center for Teaching. As a faculty developer, she leads the Scholarship of Teaching and Learning program, where she supports faculty to conduct a systemic inquiry about their teaching practice to examine whether they could support their students' learning.

Gary Steffensmeier, PhD (University of Iowa)

Adjunct Professor, Learning Sciences and Educational Psychology

Gary Steffensmeier received his PhD in Educational Psychology at the University of Iowa. His research has focused on student use and teachers' beliefs about and adoption of one-to-one technology initiatives in public schools. He is currently employed by the Puerto Rico Community Schools, Department of Defense Education Activity.

Our Students

Our PhD and M.A. students come to us from a variety of academic backgrounds, including education, psychology, philosophy, medical education, and child life. Our program includes both full-time and part-time students, with completion time to degree ranging from 5 to 10 years (median of 6.3 years) for the PhD and 1-3 years for the M.A. Naturally, our part-time students take longer to complete their degrees than our full-time students. Our PhD students are not required to have completed a masters' degree prior to applying to our program. Our program includes students from Iowa, from throughout the U.S., and international students, providing a mix of backgrounds, cultures, and experiences.

We emphasize the importance of professional scholarly work for our students. Our PhD students are required to complete an independent research study and report their work to our faculty and their peers. In addition, every year, our students submit their research for presentation at national professional conferences. Our students have presented at the Annual Meeting of the American Educational Research Association, the International Conference of the Learning Sciences, the Digital Media and Learning Conference, the International Conference on the Foundations of Digital Games, Critical Questions in Education Conference, the Educause Learning Initiative, International Meeting on Simulation in Healthcare, Games+Learning+Society Conference, and the Annual Meeting of the National Council on Measurement in Education. Our students are also co-authors of scholarly publications and those who continue in academic work following graduation continue to conduct research.

Our Facilities

Learning Sciences Lab (348 Lindquist Center)

Students in the Learning Sciences and Educational Psychology program enjoy the use of a private computer lab that includes 4 workstations and access to a printer.

Student Commons (2nd Floor North Lindquist Center)

Newly renovated for fall 2021, our students enjoy a collaboration and study space that includes access to a café area.

Office Space

Students who receive a teaching, research, or graduate assistantship are provided access to shared office space in the Lindquist Center. Typically, the space includes a desk and access to a computer.

Other information about graduate student life at the UI College of Education can be found at this website: <https://education.uiowa.edu/student-experience/graduate-student-life>.

MA in the Learning Sciences and Educational Psychology

The 30-semester-hour M.A. in Learning Sciences and Educational Psychology emphasizes the ways theory and research inform our understanding of learners, learning, instruction, and the technology and environments in which learning and instruction occur. Elective opportunities allow students to develop a multidisciplinary specialization, including technology and media, human development and motivation, and measurement and evaluation. Students have the option of completing a capstone experience that may be a portfolio, internship, or practicum that allows the student to apply knowledge of the Learning Sciences.

Beginning fall 2024, undergraduate students at the University of Iowa may enroll in an Undergraduate to Graduate (U2G) option to complete their undergraduate degree and the MA in Learning Sciences and Educational Psychology in a five-year period. While many of the requirements of the U2G in LSEP are the same, there are some course requirements and restrictions. Interested students should speak with the Educational Studies and Human Relations advisor in the College of Education or Kathy Schuh in Learning Sciences and Educational Psychology for details.

Required Courses

PSQF:6204 Foundations of the Learning Sciences (or PSQF:4204 Introduction to the Learning Sciences if U2G)

PSQF:6205 Design of Instruction (or PSQF:4205 Design Principles for How People Learn if U2G)

PSQF:6200 Educational Psychology

PSQF:6203 Tools and External Representations in Learning Processes

PSQF:6281 Cognitive Theories of Learning (or PSQF:4281 Cognitive Principles for How People Learn if U2G)

PSQF:6214 Design of Learning Environments

PSQF:6215 Online Teaching: Design and Facilitation OR PSQF:6208 Digital Media and Learning

PSQF:6299 MA Project: Internship/Practicum/Portfolio. Our preference is that our MA complete a design project within the context of an internship, practicum, or portfolio. At times, depending on where an MA student will go next or where they have come from, they may, in consultation with their advisor, to take a formal written comprehensive examination and complete one additional course from the elective area.

Elective Opportunities (2-3 courses depending on comprehensive exam/capstone choice)

Electives allow the student to choose a strand of interest to develop a multidisciplinary specialization or may include more than one areas if taking 3 courses. Current areas and course options within include:

Human Development and Motivation

- PSQF:4106 Child Development
- PSQF:4111 Human Motivation

- PSQF:4130 Early Adolescent Development
- PSQF:4133 The Adolescent and Young Adult
- PSQF:6206 Advanced Child Development

Measurement and Evaluation

- PSQF:4143 Introduction to Statistical Methods
- PSQF:6243 Intermediate Statistical Methods
- PSQF:6257 Educational Measurement and Evaluation
- PSQF:6220 Quantitative Educational Research Methods
- PSQF:5165 Introduction to Program and Product Evaluation
- PSQF:6265 Program Evaluation

Technology and Media

- PSQF:6208 Designing Educational Multimedia
- PSQF:6215 Online Learning: Design & Facilitation
- PSQF:7331 Digital Media and Learning
- PSQF:6216 Online Tools and Utilities
- PSQF:6211 Universal Design and Accessibility for Online Learning

Learning in the Disciplines

- EDTL:6267 Seminar: Current Issues in Art Education
- EDTL:6315 Masters Seminar in English Education
- EDTL:5535 Current Issues in Mathematics Education EDTL:6570 Foundation of School Mathematics Curriculum
- EDTL:6483 Multilingual Education and Applied Linguistics
- EDTL: 4630 Psychology of Music
- EDTL: 5610 Foundations of Music Education
- EDTL:6757 Learning in the Science Classroom
- EDTL:6758 Writing in the Science Classroom
- EDTL:6833 History and Foundations of Social Studies Education

Major Tasks in the MA Program

While the primary focus of progressing through the MA program is completing coursework, by the second year of their program MA students need to be prepared for a degree capstone that may be an experience such as a portfolio, internship, or practicum or a formal written comprehensive examination. Those choosing the written comprehensive exam take an additional course to complete the 30-credit degree requirement.

Choose classes under the guidance of your advisor. Each semester, seek a balance in the types of classes that you take: design classes (i.e., larger projects as assignments), content deep classes (i.e., papers and perhaps exams as assignments), or classes that include routine problem-solving assignments on a weekly basis. During this time, it is important to meet with your advisor at least once a semester when registration time approaches to ensure that you are making appropriate academic progress.

Immerse yourself in opportunities to learn about the Learning Sciences and Educational Psychology and to learn from your peers. Our program offers a number of informal experiences that our MA students are welcome to attend. These include our monthly “chats” (informal get-togethers with one or more faculty where students can ask questions about the program, requirements, etc.), our LSEP Design Expo and Research Symposium (our students and faculty who have completed research projects or design projects share their work). Our MA students expected to share their capstone project at the Design Expo.

Capstone: At the start of your second to the last semester, consult with your advisor about what your capstone for the degree will be. Depending on your career and further academic goals, you may choose on from three options for your capstone. That said, the faculty encourage students to choose and internship or practicum so they have an opportunity to better apply what they have learned in the program and showcase that to prospective employers or admissions committees. Options include:

Internship / Practicum (enroll in PSQF:6299 in your second to the last semester; you may choose to register for a portion of the credits in that semester and the rest in your final semester) In this type of capstone experience the student shows their depth of learning from the program by engaging in a real-world project with a client. The difference between an Internship and a Practicum experience is often about being paid. Typically, a practicum experience is unpaid and an internship is paid for by the organization that has hired the intern. It is the responsibility of the student to find and arrange for the opportunity, although at times the advisor may have sources and suggestions that would help secure the internship/practicum.

In your second to the last semester, as arrangements for the experience are being made, you will create a plan of activity that describes the activities of the internship/practicum, the amount of time involved, product deliverables for the client, and a final document that will be submitted to the program faculty for review and evaluation. A letter of support should also be provided by the organization who is the client for the experience.

Although this is an independent project, you will need to be in contact with your advisor throughout the process. Realize that your advisor must review drafts of your materials throughout the process and sign off on the work prior to submitting it to your committee in your final semester. You might wonder, what will those materials look like? It depends on what you are doing for your internship/practicum. Likely you’ll create some kind of document that is akin to the full design document that you might have created in PSQF:6205 *Design of Instruction*, PSQF:6214 *Design of Learning Environments*, or PSQF:6215 *Online Teaching: Design and Facilitation*. You will want to document your process and support your work given theories, research, and best practices that you learned about in your course work. See Appendix A for a description of the required document for your project, an outline for the final deliverable of a design project, and a timeline example.

In your *final* semester you will present your work (this serves as your comprehensive examination). In addition to this exam, you will likely have at least one course to enroll in (you must be enrolled in a course in the semester in which you take your comprehensive examination).

There are a number of steps that take place prior to presenting your work to the faculty.

- Attend the LSEP Research and Design Seminar to help make timely progress on your work and get feedback and support from your peers and the faculty.
- Consult with the Office of Student Services in the College of Education early in the semester about paperwork deadlines.
- In collaboration with your advisor, decide your faculty committee members and contact them expressing your interest in having them on your committee and asking if they would be interested.
- Schedule a meeting of the committee prior to the deadline provided through the Office of Student Services. Secure a meeting room (typically S350 LC scheduled through Patricia Martin in the P & Q office).
- Provide drafts to your advisor in a timely fashion for feedback. Typically, it will take a number of rounds of feedback to reach the final polished document.
- Two weeks prior to that date to present your work to your committee, provide them the copy of your work that has been approved by your advisor.
- During this time in which your committee is reviewing the document, review your coursework so you are prepared for any questions that the faculty may ask. Realize that your project will provide the backbone of the meeting, but faculty are adept at making links across content and could ask you questions that link to content that is not covered in your document.
- Prepare a 15-minute powerpoint presentation that you will present to the faculty at the start of your meeting.
- Attend the meeting – this is a professional event. Dress accordingly. Arrive early so that you can become comfortable in the room and set up your presentation.
- At the start of the meeting after all of the faculty have arrived, you will be dismissed from the room so that the faculty can organize the meeting. The amount of time that it takes the faculty to organize the meeting is not reflective of the quality of your work. Don't be alarmed if they meet for 15 or more minutes.
- When you are called back into the room, you will give your presentation.
- After your presentation, the faculty will ask you questions. A few rules of thumb: 1) Make sure you understand each question before you answer it. You can do this by repeating the question back to them or embedding the question into the start of your response. If something about the question is not clear to you, be sure to ask for clarification! 2) If you don't know an answer or haven't thought about a particular issue that has been brought up, say so, and then give it your best shot. 3) Given this is an examination regarding the work you've done in the program, answers typically should be supported with learnings from the program, rather than just your opinions.
- After the questioning is completed, you will again be asked to leave the room. The committee will make a decision about your exam and your document. Options include:
 - You will pass the exam and there will be no changes to your document.
 - You will pass the exam and there will be changes to be made to your document that will need to be completed by the end of finals week.
 - You will not pass your examination and you make take it again the following semester. You will be provided feedback on what needs to be improved in your work.

- You will also be encouraged to present your work at our LSEP Design Expo and Research Symposium.

Portfolio (enroll in PSQF:6299 in your second to the last semester; you may choose to register for a portion of the credits in that semester and the rest in your final semester)

Throughout the program you have assembled pieces to a professional portfolio that will reflect your personal and professional growth and understanding about applying research and theories from the Learning Sciences. This portfolio should

1. indicate a breadth of understanding of the learning sciences in general as well as a synthesis of areas of the LSEP that you find most useful in your current or future work.
2. include at least six artifacts that demonstrate your understanding of the learning sciences and how it can inform instruction/intervention, as well as reflective statements.
3. indicate growth in understanding by including reflective statements documenting prior understanding and new learning reflected in application of learning science research and theories.

A potential process for completing the portfolio would include the following steps:

1. Choose at least 5 existing key artifacts for your portfolio. The artifacts are assignments that you completed in your classes. Select these artifacts from the courses that you have taken in this program. Given that many or all of these entries will have been created prior to completion of the portfolio, revisit and refine the entries, particularly the reflective writings associated with each.
2. Following selection and refinement of these 5 artifacts, look across the decisions and improved understanding reflected in these five artifacts. Drawing on this reflection as well as other insights that you have developed throughout your coursework in the program, identify themes that exist across your artifacts. These themes may have to do with instructional/learning issues, problems, or limitations; needs of particular learners and the learning environment; or other themes emerging from your collection of artifacts. Collectively, these themes should provide a framework on which you may apply your synthesis of learning science issues. Use the results of this reflective activity to integrate the pieces of your portfolio. In other words, begin the process of having your portfolio tell a unified story about your professional growth and development in this program.
3. Create a new artifact for your portfolio to be the culminating piece for your portfolio in which you draw on your developed synthesis. As you develop this new entry, include a comprehensive view of the learning sciences. For example, rather than considering an area of the learning sciences as a discrete isolated topic as may have been the case in the artifacts created for individual courses, this final artifact should demonstrate your ability to apply a variety of learning sciences research and theories to a particular instructional issue or problem.
4. Although this is an independent project, you will need to be in contact with your advisor throughout the process. Realize that your advisor must review drafts of your materials throughout the process and sign off on the work prior to submitting it to your committee.
5. In your *final* semester you will defend your work (this serves as your comprehensive examination). Consult with the Office of Student Services in the College of Education early in the semester about paperwork deadlines. In addition to this exam, you will likely

have at least one course to enroll in (you must be enrolled in a course in the semester in which you take your comprehensive examination).

6. You will also be encouraged to present your work at our LSEP Design Expo and Research Symposium.

There are a number of steps that take place prior to presenting your portfolio to the faculty.

- Attend the LSEP Research and Design Seminar to help make timely progress on your work and get feedback and support from your peers and the faculty.
- Consult with the Office of Student Services in the College of Education early in the semester about paperwork deadlines.
- In collaboration with your advisor, decide your faculty committee members and contact them expressing your interest in having them on your committee and asking if they would be interested.
- Schedule a meeting of the committee prior to the deadline provided through the Office of Student Services. Secure a meeting room (typically S350 LC scheduled through Patricia Martin in the P & Q office).
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- You will not pass your examination and you make take it again the following semester. You will be provided feedback on what needs to be improved in your work.

Comprehensive Examination

The MA Comprehensive Examination includes 2 sections. These sections are scheduled as two 3-hour blocks, each covering a different content focus. The semester prior to the examination, the student should consult with his or her advisor about the content focus of the two sections and a plan for preparation for the examination. Realize that studying for a formal comprehensive examination can take a bit of time – plan accordingly.

In addition to this exam, you will likely have at least one course to enroll in (you must be enrolled in a course in the semester in which you take your comprehensive examination).

There are a number of steps that take place in the semester of your comprehensive examination.

- Consult with the Office of Student Services in the College of Education early in the semester about paperwork deadlines.
- In collaboration with your advisor, decide your faculty committee members and contact them expressing your interest in having them on your committee and asking if they would be interested.
- Schedule a meeting of the committee prior to the deadline provided through the Office of Student Services. Secure a meeting room (typically S350 LC scheduled through Patricia Martin in the P & Q office).
- Watch for emails from the Office of Student Services about the schedule and process for the written portion of your exam.
- Prior to your scheduled meeting with the faculty, the faculty will receive copies of your written responses to the questions.
- Attend the meeting – this is a professional event. Dress accordingly. Arrive early so that you can become comfortable in the room.
- At the start of the meeting, after all of the faculty have arrived, you will be dismissed from the room so that the faculty can organize the meeting. The amount of time that it takes the faculty to organize the meeting is not reflective of the quality of your work. Don't be alarmed if they meet for 15 or more minutes.
- When you are called back into the room, the faculty will ask you questions. A few rules of thumb: 1) Make sure you understand each question before you answer it. You can do this by repeating the question back to them or embedding the question into the start of your response. If something about the question is not clear to you, be sure to ask for clarification! 2) If you don't know an answer or haven't thought about a particular issue that has been brought up, say so, and then give it your best shot. 3) Given this is an examination regarding the work you've done in the program, answers typically should be supported with learnings from the program, rather than just your opinions.
- After the questioning is completed, you will again be asked to leave the room. The committee will make a decision about your exam. Options include:
 - You will pass the exam.

- You will not pass your examination and you make take it again the following semester. You will be provided feedback on what needs to be improved in your work.

PhD in Learning Sciences and Educational Psychology

The PhD in Learning Science and Educational Psychology requires a minimum of 72 semester hours of graduate credit, and students work closely with an advisor to define a program of study that matches their goals and interests. The coursework includes areas within educational psychology and the learning sciences, including courses in cognition and representations, learning theory, instructional design, learning environments, and learning technologies. Other learning opportunities include a research project, a design opportunity, a minor focus area, several courses in educational measurement and statistics, and a dissertation in the fields of learning sciences and educational psychology.

Some requirements may be waived for students who begin the PhD with a master's degree or with coursework from another program. To gain approval of these courses for the student's plan of study, the Graduate College will first approve potential courses. From those, a subset may be applied towards the degree if approved by the advisor in consultation with faculty with expertise in the content areas. The student will be required to provide a syllabus from the course completed including a list of reading materials and assignments for the course.

Students should check with their advisor about specific offerings. All courses listed are 3 semester hours unless otherwise indicated.

Required LSEP Courses

All of these (or equivalent):

- PSQF 6200 Educational Psychology,
- PSQF 6203 Tools and External Representations in Learning Processes,
- PSQF 6204 Foundations of the Learning Sciences,
- PSQF 6205 Design of Instruction,
- PSQF 6214 Design of Learning Environments,
- PSQF 6281 Cognitive Theories of Learning,
- PSQF 6230 Research in Educational Psychology (≥ 3) *
- PSQF:6299 Project/Portfolio/Internship (2 s.h.)
- PSQF 7493 PhD Thesis in Educational Psychology (≥ 10)

* Students who enter the PhD program holding an M.A. or M.S. with an acceptable empirical thesis are exempt from PSQF:6230 and the project upon advisor approval.

Core Multi-disciplinary Courses

(9 s.h. minimum; students may choose one specialization area or across the breadth of offerings)

Human Development and Cognition

- PSQF 6206 Advanced Child Development
- PSQF:6213 Advanced Lifespan Development
- PSQF 6275 Constructivism and the Design of Instruction

Media and Technology

- PSQF:6208 Digital Media and Learning (limited offering)
- PSQF:6211 Universal Design and Accessibility for Online Learning
- PSQF:6215 Online Instruction: Design and Facilitation
- PSQF:6216 Online Tools and Utilities

Learning in the Disciplines

EDTL:6267 Seminar: Current Issues in Art Education

EDTL:6315 Masters Seminar in English Education

EDTL:6570 Foundation of School Mathematics Curriculum

EDTL:6483 Multilingual Education and Applied Linguistics

EDTL:6757 Learning in the Science Classroom

EDTL:6758 Writing in the Science Classroom

EDTL:6833 History and Foundations of Social Studies Ed

Other

- PSQF 7331 Special Topics in Educational Psychology (topics vary, may be taken more than once if EP content and may be applied to a particular specialization area)

Required Research Methods and Statistics Courses

- PSQF 6220 Quantitative Educational Research Methods,
- PSQF 6243 Intermediate Statistical Methods
- PSFQ 7331 Qualitative Educational Research Methods,

One of the following:

- PSQF 6246 Design of Experiments
- PSQF 6270 Generalized Linear Models
- EDTL 7072 Advanced Methods of Literacy Research: Qualitative Data Analysis and Reporting
- EDTL 7410 Mixed Methods Research

Minor Area Requirement

Students must complete a minimum of 12 s.h. that constitute a coherent program of course work outside of learning sciences and educational psychology and beyond the courses listed above. The minor area may be from a foundation discipline, such as psychology, or in another area of education, such as mathematics education, educational philosophy, or program evaluation. Course work must be at or above the 6000-level and may span departments and colleges. At times, the advisor will be able to approve the coursework for this minor area. In other instances, the advisor will instruct the student to seek out a faculty member from the minor area to support course selection. Whatever the method of course selection, the minor area must be approved by the advisor.

Other Electives

Up to 6 s.h.; others may be included given consultation with advisor. These courses may be chosen to add to the students' research experiences, their college teaching skills, or to address a personal academic goal of the student.

College Teaching

- PSQF 6217 Seminar in College Teaching
- PSQF:7380 Practicum in College Teaching (variable credits)

Measurement and Evaluation

- PSQF 6245 Application of Multivariate Statistical Techniques
- PSQF 6257 Educational Measurement & Evaluation
- PSQF 6265 Program Evaluation

In addition to the above listed coursework, students complete an independent design project (typically in their second year), a pre-candidacy research project (typically in their third year), and a comprehensive examination (typically in their fourth year). These milestones are described in the next section.

Major Tasks in the PhD Program

While the overall goal of a PhD student is to develop a program of research that will propel them to become a professional in the field, many students consider that the first tasks for their degree are to take courses. That is, in fact, the case, with the caveat that taking these courses are to help you develop knowledge of constructs and processes that are the foundation for your program of research. During the first three years, students take the bulk of their formal coursework, choosing classes under the guidance of their advisor. Each semester, try to seek a balance in the types of classes that you take: design classes (i.e., larger projects as assignments), content depth classes (i.e., papers and perhaps exams as assignments), statistics classes (routine problem-solving assignments likely on a weekly basis). Within this time, decide on your minor area and complete that course work. Also, complete your design project and your pre-candidacy research project. These tasks will take about 3 years for a full-time student. During this time, it is important to meet with your advisor at least once a semester when registration time approaches to ensure that you are making appropriate academic progress.

Learning Sciences and Educational Psychology Research and Design Seminar

Students who are working on independent projects such as their design projects, their pre-candidacy research project, or their dissertation are encouraged to attend the bi-weekly LSEP Research and Design Seminar. You do not register for this seminar, but while you are working on those projects you will be enrolled in PSQF:6299 Project/Portfolio/Internship; PSQF 6230 Research in Educational Psychology; or PSQF 7493 PhD Thesis in Psychological & Quantitative Foundations. While your advisor will meet with you as needed and provide feedback as you plan, implement, and write about your project, meeting as a group allows you learn from your peers and develop a support network. Within any project there are often tasks that can be shared. We encourage our students to rely on one another to support usability testing, code data, pilot surveys, provide written feedback, etc. Be sure to pay attention to notices about the seminar at the beginning of each semester. We try to schedule the seminar so that it does not conflict with any courses that we offer in our program; therefore, the day/time may change from semester to semester.

Independent Design Project

In our program, we consider that design is an important foundation for the development of a viable research project. We look at design as a tool to address a number of preliminary tasks that

can lead to stronger and more successful research studies. In your second or third year of study (consult with your advisor for best sequencing of the Independent Design Project and your Pre-candidacy Research Project), you will complete a small design task of your choosing (register for PSQF:6299 Project/Portfolio/Internship for two semester hours). Choices for this project include continuing an instructional design completed in a prior course (e.g., PSQF:6205, PSQF:6214, or PSQF:6215) based on usability testing, designing and conducting usability testing of an element of an instructional intervention that will be useful in a later research project, piloting a small survey or questionnaire to address a particular need, or other projects of similar scope that you propose to your advisor. See Appendix A for a description of the required Design Project, an outline for the final deliverable of a design project, and a timeline example.

Pre-candidacy Research Project

Your Pre-candidacy Research Project is a small-scale mentored research project which you will undertake in your second or third year (consult with your advisor for best sequencing of the Independent Design Project and your Pre-candidacy Research Project). While your advisor or another faculty member will mentor you through the process, the bulk of the project work is the responsibility of the student. This description provides one example of the process. Your advisor may have other ways to support your work in the process.

As you complete this project you will register for PSQF:6230 Research in Educational Psychology. You must present the work in both oral and written form to the program's faculty and students. The written report must be completed by the end of your third academic year in the program. You may re-enroll in this course beyond their third year.

It is likely that even a small study, such as that required for this research project, will span more than one semester from conceptualization until final presentation and write up. Your advisor will be able to provide guidance on how to enroll for the required course credits (i.e., all in one semester or having the credits distributed across semesters). The purpose of this research project requirement is so that students are prepared to conduct their dissertation which will be much less scaffolded and largely independent. Given that goal, while students are able to complete this research project in collaboration with a faculty member or other students, the student must be considered the first author on the article that reports the study.

To prepare for your research project, read the literature regarding your area of interest and potential study topic. All studies must stem from, and contribute to, the scholarly literature.

Although you will attend the LSEP Design and Research Seminar while working on your project, it will also be necessary to meet with your advisor at a mutually agreed upon time. Please come prepared to the meeting with ideas and questions about your study.

Work Plan

1. Create a prospectus for your study. This document will be a tool that you can use to further define your study and will provide an outline for the paper that will report your study. The two-page prospectus should include a clear statement of the questions to be addressed in the study with a bit of grounding to indicate from where your question(s) emerged (i.e., the *argument* through which you are making a claim that your study is

important given literature from your field of study, the specific problem that your study might shed light on), an outline of the design of the study, the research methods to be used, expected outcomes, and a discussion of the contribution of the study to your field of study. You should also include a timeline and a budget, if appropriate.

2. Once your advisor has approved your prospectus, obtain IRB approval, and conduct your study.
3. While implementing your study, continue to polish the background section for your article (i.e., expand on the background you had in your prospectus), which will provide an outline for the full background section.
4. After completion of your study, write a formal article that will be appropriate to submit for a conference presentation and/or publication. Your advisor will have the option of being second author on this study. Submit the article to your advisor for a number of rounds of feedback (it is typical that the first draft is never the final draft!).
5. You and other students who have completed their research projects will be invited to present their work before the LSEP faculty and students. Information will be provided about the presentation format as that time comes nearer (typically week 14 of the semester), but a good way to find out what it will be like to present is to attend the research symposium each semester.
6. Submit the article for presentation and/or publication. Your advisor will work with you to find an appropriate outlet and engage in the process.

At some time during this process, you will need to register for PSQF:6230 Research in Educational Psychology (3 credits). Conducting a study takes more than a semester. One suggestion is to begin planning and implementing your study *before* you register for PSQF:6230. That way, you will be less likely to receive a course grade of “incomplete,” or if you do, you’ll have a better chance of removing it before it becomes an F (no worries though, it’s as easy to change an F to a Satisfactory as it is to change an Incomplete to a Satisfactory. However, the F does have implications for your GPA while it’s on your transcript). Talk with your advisor about when might be the best time to register for the course credit.

PhD Comprehensive Examination

The PhD comprehensive examination emphasizes competence and depth in one or more narrowly defined areas of research and theory. It is typically completed in the last semester of the 3rd year or the first semester of the 4th year of study. Students choose from three options in consultation with their advisor and with the approval of the examining committee, which is made up of at least four faculty members and is not necessarily the same as the dissertation committee. The options are a review article, an extended research activity, or a traditional comprehensive examination. The traditional comprehensive examination in Educational Psychology is comprised of three sections.

Section 1 – general learning sciences and educational psychology for all PhD students.

Goal: Provide doctoral students the opportunity to move their understanding of concepts and topics in learning sciences and educational psychology beyond that grounded in individual courses to a synthesis of understanding reflective of a professional early in the field. The student will demonstrate the ability to think psychologically about problems and issues relevant to education, learning, and instruction and support their responses by drawing on literature.

In our program we draw on three foundation pillars to ground the content of section one of the exam: Cognition, Context, and Design. Broadly, these pillars provide an umbrella for content in core courses relevant to learning, cognition, instruction and the environments and tools that support those processes. The exam occurs in a 3-hour block. Students are not allowed to use materials during the exam. They are expected to cite relevant sources in their responses (author and year) but are not required to include a reference list.

Coursework that supports preparation:

- PSQF 6200 Educational Psychology
- PSQF 6203 Tools and External Representations in Learning Processes
- PSQF 6204 Foundations of the Learning Sciences
- PSQF 6205 Design of Instruction
- PSQF 6208 Digital Media and Learning
- PSQF 6214 Design of Learning Environments
- PSQF 6215 Online Instruction: Design & Facilitation
- PSQF 6275 Constructivism and the Design of Instruction
- PSQF 6281 Cognitive Theories of Learning

Additional readings that support preparation: see Appendix B.

Note: Students for whom there is considerable overlap between the content in section 1 and their student-specific area of expertise (see section 2) should consult with their advisor about how that overlap will be addressed.

Section 2 – student-specific area within the fields of learning sciences and educational psychology.

Goal: Provide doctoral students the opportunity to further develop an area of expertise in the fields of learning sciences and educational psychology that will provide support for future dissertation work. The student's area of expertise is developed throughout the student's graduate career and is fine tuned in consultation with the student's advisor. The exam portion occurs in a 3-hour block. Students are not allowed to use materials during the exam. They are expected to cite relevant sources in their responses (author and year) but are not required to include a reference list.

In the semester prior the comprehensive examination, the student will develop a reading list of, at minimum, 15 to 20 articles representing the area of study. These articles should include those foundational to the topic, not be redundant with course readings, and should represent the current state of the topic. This list will be submitted to advisor at least 5 months prior to the exam. The advisor will provide feedback and/or approval within two weeks of receipt.

One month before the comprehensive examination, the student will submit a list of at least five comprehensive questions that point to key issues and important syntheses in the topic area. These questions will be submitted to the advisor and *may* provide the foundation for section 2 of the comprehensive exam. Students may also be asked to revise these questions to be resubmitted to the advisor.

Section 3 – Minor area

Goal: Provide doctoral students the opportunity to synthesize understanding of a minor area of study that is outside the fields of learning sciences and educational psychology. While this area is outside of LSEP, the content should be relevant to the students' research or professional development.

If the exam is a traditional written exam, it occurs in a 3-hour block and parameters of the content are defined in conjunction with a faculty member in the minor area. Oftentimes, the advisor in the minor area is open to alternative comprehensive exam formats such as a paper.

Timeline

1. At least one full semester prior to the semester in which you will take the examination:
 - Meet with advisor about comprehensive exam process and preparation.
 - Determine comprehensive exam committee. The committee must meet the following requirements:
 - a. At least four members
 - b. A chair or co-chair who is tenure track faculty in the LSEP program
 - c. At least 2 members from the LSEP faculty
 - d. A faculty member representing the minor area of study
 - e. A faculty member with expertise in the student's specialty area
 - f. At most 1 clinical professor, the other members must be tenure-track graduate school faculty.
2. At least five months prior your exam date, submit to your advisor the problem space on which **section 2** of your exam will be focused. Within two weeks following that submission, provide your section 2 reading list to advisor for feedback and approval. You can expect feedback on this list within two weeks. Therefore, your section 2 problem space and reading list will be fully completed at least four months prior to your comprehensive examination date. Failure to submit these by the required deadlines could result in scheduling your comprehensive examination in the next semester.
2. One month prior to comprehensive examination
 - Submit **section 2** questions to advisor for feedback and approval. Failure to submit these by the required deadlines could result in scheduling your comprehensive examination in the next semester.
3. Week 1 of semester in which you take your exam:
 - Submit PhD comp request and plan of study sheet
4. Week 3 or 4 (typically – this date is set by the graduate college)
 - Take your exam.
5. Following your exam
 - In consultation with your advisor, schedule a meeting of your comprehensive exam committee for the oral portion of your exam. It is the student's responsibility to schedule a room for the oral exam (typically S350 LC if the room is available).
 - Prior to the meeting you scheduled with the faculty, they will be provided with copies of your written responses to the questions.
 - Attend the meeting – this is a professional event. Dress accordingly. Arrive early so that you can become comfortable in the room.

- At the start of the meeting, after all of the faculty have arrived, you will be dismissed from the room so that the faculty can organize the meeting. The amount of time that it takes the faculty to organize the meeting is not reflective of the quality of your work. Don't be alarmed if they meet for 15 or more minutes.
- When you are called back into the room, the faculty will ask you questions. A few rules of thumb: 1) Make sure you understand each question before you answer it. You can do this by repeating the question back to them or embedding the question into the start of your response. If something about the question is not clear to you, be sure to ask for clarification! 2) If you don't know an answer or haven't thought about a particular issue that has been brought up, say so, and then give it your best shot. 3) Given this is an examination regarding the work you've done in the program, answers typically should be supported with learnings from the program, rather than just your opinions.
- After the questioning is completed, you will again be asked to leave the room. The committee will make a decision about your exam. Options include:
 - You passed your comprehensive exam.
 - You passed your comprehensive examination with reservations. The committee will decide what you need to do to remove the reservations and the timeframe in which that will take place. This could be taking additional courses, doing additional writing, or other learning opportunities that will help position you for dissertation work.
 - You failed the examination and you make take it again the following semester. You will be provided feedback on what needs to be improved in your work.

Dissertation

The doctoral dissertation or thesis should not be considered a single event in your career as a graduate student. Rather, the dissertation provides an important juncture in the research trajectory of being a PhD graduate student, doctoral candidate, and educational professional. The following describes one such trajectory, including details about the dissertation. Consult with your advisor about the plan that you should follow.

Pilot study. Hopefully, as you worked on your coursework you conducted a study that can serve as a pilot study for your dissertation (i.e., your pre-candidacy research project) and perhaps took time to develop design elements that may be part of your dissertation (i.e., your design project). If not, you may need to “pilot” some elements of your dissertation study prior to defending your proposal. Conducting a pilot study allows you to start your research agenda as well as explore methods, issues, and instruments that may be of use in your dissertation. Your pilot study should stem from a variety of readings and the identification of a research question. A pilot study should be small. Although a pilot study may answer a question, it should also pose questions. Those questions can lead to your dissertation and further your research agenda.

Prospectus. The two-page prospectus should include a clear statement of the questions to be addressed in the study with a bit of grounding to indicate from where your question(s) emerged (i.e., the argument through which you are making a claim that your study is important given literature from your field of study), an outline of the design of the study, the research methods to be used, expected outcomes, and a discussion of the contribution of the study to your field of study. You should also include a timeline and a budget, if appropriate. If you have completed a

pilot study or your dissertation is well linked to your pre-candidacy research project, the prospectus will be fairly easy to write.

A prospectus should be short! Consider this, if you cannot write two clear pages about your proposed study, your dissertation chair and committee members will struggle to read 40+ pages of unclear grounding and description about your study for your proposal. Developing a clear concise description of the argument for your study that points to necessary grounding, research design, and research methods will speed up your work overall.

The prospectus should play an important role in the selection of your dissertation committee. This document allows prospective members to decide whether to participate on the committee based on the area of focus and the integrity of the prospectus. In addition, it provides an avenue early in the development of your proposal for you to garner feedback and perceptions about your study that you can then incorporate into your proposal. This process can be as simple as contacting a prospective dissertation committee member by e-mail or in person, asking them if they would be willing to serve on your dissertation committee given _____ (why would your dissertation interest them or what expertise do they bring to the review of your work?), noting that you've attached (or handed them) a research prospectus—a brief plan of your study, asking them to let you know if they are interested in being on your committee, and also stating that you are interested in any feedback that they can provide as you further develop your proposal.

Proposal. The prospectus provides an outline for the dissertation proposal. The proposal is considerably more detailed, filling in gaps that may have been omitted in the brief prospectus. It should fully provide a rationale for the study that will be conducted and how it will be conducted. The proposal should contain the following elements: a statement of purpose, rationale, literature review, research questions, proposed procedures, the source of data, methods of data collection, methods of data analysis or data reduction, and the contribution of the study to theory and/or to practice. In a sense, the proposal serves as the backbone for your first three dissertation chapters. Remember, an approved proposal is your contract with your committee. You are stating that you will complete the research that you proposed. If you plan to deviate from that plan in any way, you need to make sure that it is with the approval of your dissertation chair.

There are a number of steps that take place prior to presenting your proposal to the faculty.

- Provide drafts to your advisor in a timely fashion for feedback. At times, there may need to be a number of iterations of feedback to reach the final polished proposal. Remember that the clearer the document, the easier it will be for the committee to understand your work. If your advisor says it's not clear, then likely it's not clear. Keep working at it.
- Schedule a meeting of the committee. Secure a meeting room (typically S350 LC scheduled through Patricia Martin in the P & Q office).
- Two weeks prior to that date to present your work to your committee, provide them the copy of your work that has been approved by your advisor.
- During this time in which your committee is reviewing the document, prepare a 15-minute powerpoint presentation that you will present to the faculty at the start of your meeting.

- Attend the meeting – this is a professional event. Dress accordingly. Arrive early so that you can become comfortable in the room and set up your presentation.
- At the start of the meeting, after all of the faculty have arrived, you will be dismissed from the room so that the faculty can organize the meeting. The amount of time that it takes the faculty to organize the meeting is not reflective of the quality of your work. Don't be alarmed if they meet for 15 or more minutes.
- When you are called back into the room, you will give your presentation.
- After your presentation, the faculty will ask you questions. A few rules of thumb: 1) Make sure you understand each question before you answer it. You can do this by repeating the question back to them or embedding the question into the start of your response. If something about the question is not clear to you, be sure to ask for clarification! 2) If you don't know an answer or haven't thought about a particular issue that has been brought up, say so, and then give it your best shot. 3) Given this is an examination regarding the work you've done in the program, answers typically should be supported with learnings from the program, rather than just your opinions.
- After the questioning is completed, you may again be asked to leave the room. In this meeting the committee will decide what changes or updates need to be made to your study plan before you begin data collection. This is an important meeting as it helps to determine the contract for your work. At times, the student may have to create major revisions and present their proposal to the faculty again for further review.

Writing Your Dissertation. The dissertation provides an accounting of your research project. The length of dissertation will vary depending upon your question and your choice of methodology. Whatever topic or methodology is chosen the dissertation should provide a well-described summary of your process. The number of chapters in a dissertation may vary as well—largely due to the type of research methodology used. However, it is standard to include at least the following five chapters:

- Chapter 1: Introduction. This provides a brief overview of the dissertation and includes the purpose of the study, the theoretical framework, the statement of the problem, and often times definition of terms. You should explore other dissertations to see what types of topics have been included; then decide what appropriate sections would be appropriate for your report. Oftentimes, much of your prospectus can provide the backbone for this chapter.
- Chapter 2: Review of Literature. A careful writing of this chapter should lead the reader to the point where they say, “Wow, it sure is important that this study is being conducted. I can hardly wait to read what happens!” The literature review is not a disjointed rendering of isolated topics that relate to your dissertation question. It is a story. And in that story you describe the background that makes your study necessary. The main thread of the story is how you arrived at your current thinking about your dissertation topic, citing authors who would support your statements as you go. A good way to tackle this is to draw a diagram of the literature that leads to your question and identify (in a narrative kind of why) how one piece leads to the next in your view. Bottom line—chapter two is an argument for the need for your study. Again, the argument that you developed for your prospectus should provide organization support for this chapter. Rather than a statement about each idea, in chapter 2 you provide the support from the literature for each element of the argument.

- Chapter 3: Methods. This chapter provides a detailed framework for conducting your study. Again, you will cite references that would support pieces of your process. This methodology should be detailed enough so that someone could replicate your study and should provide support for all of your methodological decisions, including choice of instruments/tools for the particular study you are conducting and the participants you will draw on.
- Chapter 4: Findings. This chapter is probably the most straightforward and the easiest to write. In fact, with a well-defined methodology and careful data collection and analysis, this chapter should almost write itself. In this chapter, be sure to align your findings with the question(s) that you posed in chapter 1. A good question or series of questions may provide an outline for this chapter. However you structure the chapter, you must explicitly address the questions that you set out at the start of the study.
- Chapter 5: Discussion and Conclusion. Here's where you tie it all together. Include your personal perspectives that have evolved in this dissertation. Revisit your Chapter 2 in which you posed your problem in light of current literature. You need to weave your own study findings into that story. If particular items and issues led to the dissertation study, many times it is appropriate and necessary to revisit these items again in your discussion, but now from the perspective of the completed study. Remember that this is not just a reiteration of the findings, but points to how your study has advanced the field. In your discussion you may also include limitations of your study (and it is also important to admit limitations upfront in your other chapters as are necessary) as well as the potential for future research following from the study. End with an informative conclusion that points out the positive of your study.

A good way to gain an understanding of the scope and depth of a dissertation is to read a few of them! One suggestion is to read at least five with an eye towards writing style, organization, scope, etc.

Three pieces of advice that have been passed down from advisors to one of our faculty members that may be helpful in thinking about your writing process:

1. Answer all of your committees' questions before they have a chance to ask them. You do this by making sure that there is never a point in your dissertation where someone could ask you "why" or "what" or "how" and not find the answer soon after they posed the question.
2. Make each chapter complete enough that it could stand on its own. With this in mind, continually remind the reader of your study purpose. This will also help you keep each chapter focused on the issue you are addressing without taking tangents. A useful strategy is to copy and paste your purpose statement from chapter to chapter rather than trying to reword it each time you state it. Rewording can often add confusions because of you may slightly change the meaning. Consistency is a good thing.
3. Just tell the story. You do have a story to tell. You have a story that led up to the formulation of your question and you also lived a story as you conducted the research. That is the story you are to tell.

Defending Your Dissertation. The key element to remember in the oral defense of your dissertation is that you know your study better than anyone! It is your job to make clear what

you have done and why the decisions you made along the way are viable. If you have done as your promised given the approved proposal, have informed your chair along the way of any snags and addressed those issues, and if your dissertation chair has fully read and supports your work, your dissertation defense can be viewed as an interesting critical discussion of your work by a group of informed and well-intentioned colleagues.

There are a number of steps that take place prior to presenting your dissertation to the faculty for your defense.

- Consult with the Office of Student Services in the College of Education or the Graduate College early in the semester about paperwork deadlines.
- Provide drafts to your dissertation chair in a timely fashion for feedback. At times, there may need to be a number of iterations of feedback to reach the final polished dissertation. As with the proposal, it's important that your advisor signs off on this document prior to it going to the committee. It is best at a dissertation defense to have your advisor be an advocate for your work because they have already read and approved it. The defense is not the best time to have your chair get their questions resolved about your work.
- Schedule a meeting of the committee prior to the deadline provided through the Office of Student Services and the Graduate College. Secure a meeting room (typically S350 LC scheduled through Patricia Martin in the P & Q office).
- Two weeks prior your dissertation defense date, provide your committee the copy of your dissertation that has been approved by your chair. You may provide this electronically, but it is polite to ask if they might prefer a paper copy. In addition, consider that a Word document might be more useful than a PDF if they add comments or do any editing.
- During this time in which your committee is reviewing the dissertation, prepare a 15-minute powerpoint presentation that you will present to the faculty at the start of your meeting.
- Attend the meeting – this is a professional event. Dress accordingly. Arrive early so that you can become comfortable in the room and set up your presentation.
- At the start of the meeting, after all of the faculty have arrived, you will be dismissed from the room so that the faculty can organize the meeting. The amount of time that it takes the faculty to organize the meeting is not reflective of the quality of your work. Don't be alarmed if they meet for 15 or more minutes.
- When you are called back into the room, you will give your presentation.
- After your presentation, the faculty will ask you questions. A few rules of thumb: 1) Make sure you understand each question before you answer it. You can do this by repeating the question back to them or embedding the question into the start of your response. If something about the question is not clear to you, be sure to ask for clarification! 2) If you don't know an answer or haven't thought about a particular issue that has been brought up, say so, and then give it your best shot. 3) Given this is an examination regarding the work you've done in the program, answers typically should be supported with learnings from the program, rather than just your opinions.
- After the questioning is completed, you will again be asked to leave the room. The committee will make a decision about your exam and your document. Options include:
 - You will pass your defense and there will be no changes to your dissertation.

- You will pass your defense and there will be changes to be made to your dissertation that will need to be completed and approved by either your chair or your committee prior to the deposit date set by the graduate college.
- You will not pass your defenses and you can schedule it again the following semester. You will be provided feedback on what needs to be improved in your work.

Dissemination. Realize that after completing your dissertation, your next task is to disseminate your findings. Immediately, write at least one article stemming from the major findings of your dissertation. In addition, realize that your dissertation may actually contain a number of publishable articles. Get to work!

As you consider publication and presentation of your work, it is also important to think about the role that your dissertation chair, and perhaps other committee members, had in the development of the work and the writing and communication of the ideas. Generally, it is appropriate that your dissertation chair be an author on articles that are published from the dissertation work. Given this, your chair will continue in their involvement of that dissemination process, contributing in appropriate ways as the process continues. Given the importance of dissemination of research, if you are not interested in pursuing publication of an article from your dissertation or do not initiate the process within a year after your defense, your chair may take the lead in that process and could potentially be noted as first author. Be sure to have a conversation about your advisor about this early in your dissertation process and expectations and roles at various stages of the process.

You will be asked to present your dissertation research at the LSEP Design Expo and Research Symposium. To present the findings from your study at a professional conferences, submit a proposal for a research presentation after the work has begun and is hopefully completed. The research proposal for a conference is not a proposal to do research, but a proposal to report completed, or nearly completed, research.

A presentation, whether at our LSEP Symposium or a professional conference may last anywhere from 15 to 25 minutes. At a professional conference, you may be asked to provide a paper to a moderator before the conference. Be prepared for questions from the moderator and the audience.

In a research presentation you will want to touch on the following areas:

- Introduction. Generate interest in your topic. What is the purpose of your study?
- Background. What is the grounding that led you to do this study. Align your allies. And highlight the need for this study.
- Question. State your question clearly.
- Methodology. How did you do what you did?
- Findings. What did you find out?
- Discussion and implications. Tell us again why this was important, particularly to the audience to which you are presenting.
- Conclusions.

Product Deliverable Details

Whether you are an MA or PhD student, the faculty are seeking good quality work. In this it means doing the best that you can at the time, given your individual circumstances (we get it, life happens sometimes at the least opportune times). We ask all of our graduate student to grow in their abilities to communicate their work in writing and in their ability to speak about the content in our field and their own personal interests within. While we are interested in the content of your work and the thinking that it demonstrates, we also want you to build skills that allow you to show the quality of your work when you are not present there to talk about it. That means even mundane elements such as how your work looks on a piece of paper or a presentation slide.

APA Style

In our field, we largely rely on the Publication Manual of the American Psychological Association as the format for formal papers. Become familiar with this format and when in doubt on how to type up an assignment or paper, use APA. Honestly, it looks a little dull. There's a reason for that! It generally follows good design principles that allow the reader to focus on the content of your papers. APA will help you structure your document. The APA Manual also provides a great guide for basic grammar and writing as well as how to create and use citations. Of course, APA is not used for everything in our field (the papers that are submitted for the International Conference of the Learning Sciences comes to mind). But, if you can follow the APA style guide, you have the skills to make adaptations as needed to other style formats.

APA (2020). *Publication Manual of the American Psychological Association* (7th edition). American Psychology Association, Washington, DC.

Purdue Owl: (a great APA resource)

https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/index.html

Visual Design Skills

While we do not require a course on visual design and it may not be a focus within our courses, our expectation is that students develop visual design skills throughout their work in the program. While we value creativity, given the pillars of our program, visual design of materials must support learning and cognition. A great guide (don't let the publication age of the article lead you to believe it is not relevant) for understanding how cognition can be enhanced (or inhibited) through visual elements is Winn's (1993) article. In addition, understanding cognitive load is useful in designing useful materials (e.g., Sweller, 2011). The *Non-Designer's Design Book* by Williams is also a great resource for understanding fonts and how they work together. There are a number of available editions of the book. If you need help finding these resources, please consult with your advisor.

Sweller, J. (2011) Cognitive load theory. *Psychology of Learning and Motivation*, 55, 37-76. DOI 10.1016/B978-0-12-387691-1.X0001-4.

Williams, R. (years vary). *The non-designer's design book* (editions vary).

Winn, W. (1993). Perception principles. In M. Fleming & W.H. Levie (Eds.), *Instructional message design: Principles from the behavioral and cognitive sciences*. (pp. 233-250).

Englewood Cliffs, NJ: Educational Technology.

Professional Expectations

In our Learning Sciences and Educational Psychology program faculty expectation is that all of our students conduct themselves in a professional and ethical manner. This is in regard to behavior towards others, in the work that students complete, in representing our program, and in any work that is within or extends beyond our program related to professional teaching, research, and service.

Codes of Ethics and Conduct

Our goal is that all students and faculty feel confident and free to learn and share ideas. Faculty and students in our program are often members of professional organizations and we draw upon their codes of ethics to guide our own conduct. Please review the code of ethics of the [American Psychological Association](#) (particularly regarding the conduct of research) and the [American Educational Research Association](#). In addition, our University of Iowa Graduate College provides a code of conduct for graduate assistants: <https://grad.uiowa.edu/funding/graduate-student-employment-standards/issues-general-application>.

The Use of Generative AI

Faculty in Learning Sciences and Educational Psychology encourage our graduate students to consider learning as an adventure to better themselves and the world. Given that, the goal of our graduate-level courses should not be a letter grade or a credential on your transcript. You are expected to apply your own creativity and critical thinking in order to build the skills necessary to succeed in a competitive workforce. Therefore, it is important to remember that chatGPT and other generative artificial intelligence (AI) tools are not a replacement for your own critical thinking and original ideas. While each instructor will provide their own policy regarding student use of chatGPT or similar software, in general AI-generated submissions are not permitted and will be treated as plagiarism, unless the AI tools used are directly cited, justified by the student, and approved by the instructor ahead of time. Please refer to the Graduate College's policy on plagiarism: <https://grad.uiowa.edu/academics/manual/academic-program/section-iv-academic-standing-probation-and-dismissal#accordion-item-11191-5>.

The American Psychological Association provides these useful articles about the use of Generative AI in publications which are also applicable to your coursework.

- APA Publishing Policies: <https://www.apa.org/pubs/journals/resources/publishing-policies>
- APA Journals policy on generative AI: Additional Guidance: <https://www.apa.org/pubs/journals/resources/publishing-tips/policy-generative-ai>

Understanding Faculty

Whether you are an MA or a PhD student you will have to reach out to faculty from time to time. Here are some tips and ideas that may help you in that process.

- First, always remember that the faculty are here to support your academic efforts and want to see you succeed!
- Following from the first point, some days it might not feel like it! The role of the faculty is to help you improve your work, your thinking, and your professional skills so that you feel confident (and are competent) in whatever your endeavors are following your post-graduate training. You are here to learn. Feedback that something you worked very hard on is still not up to par will happen – and will happen often. Papers never really come back with an “excellent job” and no comments for improvement. It’s just the nature of graduate work. Please don’t take it personally (we are happy you are here) or think that you can’t succeed (we would specifically let you know if that was the case). We *have* decided that you have the skills to work hard and achieve your graduate degree. We wouldn’t have admitted you to the program if we thought otherwise!
- Feel free to drop into scheduled office hours of any faculty member. That’s what scheduled office hours are for. Sometimes there might be a line of students, that’s OK! It helps you to see that you are not the only one with questions!
- If office hours don’t work (or if they are by appointment), it’s totally fine to contact a professor by email to ask to schedule an appointment. It’s far less desirable to just knock on a door. Likely they are in the middle of something!
- When asking a professor for an appointment, suggest a few days and times that you could be available. Realize that if you say something like “Wednesday at 10:00” (for example), it’s likely they may have an appointment already. Suggest a few larger windows. Suggestions like “after class” might also work well.
- Our faculty have collectively seen (literally) thousands of emails from students. From those, we provide a few suggestions.
 - Provide a useful subject line (e.g., meet with you? dissertation committee request, etc.)
 - Start your email with Dear/Hi/Hello Dr./Professor So-and-So or Dear/Hi/Hello (first name) depending on how you have been invited to address the professor and what you are comfortable with. Be polite and professional (for example, “Hey” is not generally an appropriate email greeting to a faculty member).
 - Take the time to write a complete email that includes all of your questions/concerns, etc. Faculty may receive hundreds of emails a day; having a string of emails from you as questions are asked because of incomplete information slows down responses to you and may increase the possibility that you won’t get your actual request addressed – as email continues to pile up, it slides off the screen and is forgotten until the full list is scanned again.
 - Sometimes you’ll get a response right away, sometimes it might take a day or two depending on teaching and meeting schedules. If it gets to be 3-4 days, then reach out again. Sometimes we just forget.
- About committees (comps, dissertation, etc.)

- All committees are first approved by your advisor. It's fine to chat with a faculty member about upcoming events you have and say that you might reach out to them later about being on a committee but be sure to talk with your advisor first before making the formal request. There are particular "rules" about committee make up that have to be adhered to and particular information that faculty like to be provided. Your advisor can help with all of that.
- If you need to schedule a meeting with a group of faculty, it seems that most students have the best success with using a polling tool (doodle, when2meet, etc.). The time frame should be a few weeks in the future and also present a few weeks of options. Here as well, it's useful to talk with your advisor beforehand so the choices can be narrowed down before sending out the options (sometimes we get polls that includes hundreds of options – yikes!). At times students have chosen a single date and time, contacted the committee, and are then surprised that all of the committee will not be available at that time.
- Some faculty have their schedules on Outlook and students may have access to that. We advise against using this unless the faculty has invited you to do so. Oftentimes, the schedule is not up to date and may not include their dedicated work times.
- To be honest, when people who are not in academia find out that faculty may teach only one or two classes a semester, they are surprised and often assume that it's an easy job with lots of spare time. That's not actually the case! Some information about faculty appointments that might be of interest to you . . .
 - Most faculty have their work efforts allocated as percentages (for example, 40% scholarship, 20% service, 40% teaching). These percentages can vary from person to person, and for a particular person from semester to semester or year to year.
 - Scholarship includes their research (and perhaps your research if it's something that you are collaborating on that will lead to publications as co-authors) and grant writing.
 - Teaching includes teaching classes, class preparation, grading, advising, office hours, comprehensive exams, masters projects/portfolio feedback, dissertation support, etc.
 - Service is broadly defined and includes a variety of contexts – service to the department, the college, the university, and the field. This includes administering programs, taking care of program admissions, program and department meetings, reviewing faculty, reviewing journal manuscripts and conference proposals, service on the university faculty senate and other university and college committees, or serving on national committees! The variety is great.
 - Faculty appointments will vary. Most are "8-month appointments" – meaning the academic year – minus winter break, for example. Faculty who work in the summer may have 12-month appointments, are compensated for particular tasks such as teaching a class, working on their research, working on collaborative projects with other faculty, or doing administrative work. During this time, know that faculty (whether they are working during the summer or not) may be happy to hear from you, but their time for extensive work and feedback may be limited. This points to the important task for you to be proactive prior to breaks to make sure you have direction for the work you will accomplish during the break. Faculty realize that breaks from classes are good times for you to work on your independent projects and want to position you to be successful!
- Finally, after all of that, it's important to go back and read the first point!

Research and Research Opportunities

Collaborating with Faculty

Many of our faculty have current research projects on which students are able to work and gain research experience. At times there are paid assistantships, other times the student is volunteering. If you are a volunteer, remember that you are making a commitment to work on the project and need to be honest about the amount of time that you will have to allocate to the project. If you have an assistantship, the requirement is that you work a certain amount of hours on a weekly basis unless otherwise arranged with the supervising faculty. Work during this time can include attending research meetings, as well as any other stages of the research project. You may be asked to log your hours, note the tasks that you have completed, and submit this information to the supervising faculty. Whether paid or volunteer, be sure to come prepared to meetings, having completed tasks that you said you would do. Although it seems like there is no timeline for completing a research study, faculty positions at the university depend on faculty completing research and having their findings accepted for publication.

Depending on the type of contribution you make on a particular project you may be listed as a co-author on the research. We follow the ethical guidelines set out by the *American Educational Research Association* and the *American Psychological Association* regarding authorship. Having a conversation with the faculty member about publication and presentation authorship should take place early in the project.

Bi-annual LSEP Design Expo and Research Symposium

Each fall and spring semester, typically of the Friday of week 14, our program hosts a Design Expo and Research Symposium. This symposium provides a venue for our students and faculty to present their latest research and design projects. It also provides a practice field for presenting research that will be presented at a conference, providing students an opportunity for feedback from their peers and the faculty. Students are required to present a poster of their design project at the Design Expo and their pre-candidacy research project at the Symposium. Students who have completed their dissertation are encouraged to share their findings at the symposium as well.

Human Subjects Approval

No research involving human subjects can proceed without the approval of the appropriate University of Iowa Institutional Review Board (IRB). This applies to research conducted both on and off campus or in collaboration with researchers from elsewhere in the University. The Human Subjects Office provides frequent training sessions on the conducting research with human subjects. All individuals at the university who are working with human subjects must complete the CITI training (<https://hso.research.uiowa.edu/certifications-human-subjects-protections-citi>) and complete an annual conflict of interest disclosure (<https://hso.research.uiowa.edu/c-ecoi-disclosure-requirements-prior-submission>). Information on human subjects' approval is available at <http://research.uiowa.edu/hso/>. All research conducted by students must be supervised by a University of Iowa faculty and the faculty member is listed on any IRB submitted by students. In addition to these requirements, beginning fall of 2021, student PIs on research projects (so a student is the lead on the project) must

complete specific training for study PIs. The training requirement includes a two-part training on the HawkIRB New Project Form, a three-hour requirement. Students can attend the live/Zoom trainings **OR** view recorded trainings. A third HawkIRB training (Forms Submitted After IRB Approval) is not mandatory, but students are strongly encouraged to attend or view the recording.

In many of our classes, you will be asked to do projects that are design work. At times, you will implement your designs with learners (known as usability testing). This, typically, is not considered human subjects research. The goal is not to create generalizable knowledge to be shared. The learners participating in your usability testing should be informed that their participation is for a class project you are required to complete and what, where, and with whom information from the testing will be shared. Given that, any data that would be gathered from learners is likely not able to be disseminated broadly (e.g., in a paper or presentation). Sometimes this seems to be a tricky area – the best thing to do if you are thinking about writing up work that you’ve done, with the hope to share it beyond the class in which it was assigned, is to ask your advisor.

Funding for Your Research

While it is possible to conduct research without spending a dime, the College of Education provides a research grant opportunity for students who are conducting research. The *Graduate Student Research Award* covers the various costs incurred by graduate students in the design and conduction of research. These funds may be used for research-related costs, including poster printing, preparation of questionnaires, or surveys, examining archival records, transcription, payment of subjects, travel for the purpose of collecting data, and similar items. Funds may not be used to support the purchase of books, laptop computers, or software except where that software is not available through College computer labs or the University virtual desktop system. Support for the Graduate Student Research Award comes from the Graduate Student Enhancement Fund, supported by the College of Education Tuition Supplement. The maximum annual award in a single fiscal year (July 1 – June 30) is \$1,000.

<https://www2.education.uiowa.edu/forms/award/Login.aspx?ReturnUrl=%2fforms%2faward%2fResearch.aspx>

There are also grants available through the Graduate and Professional Student Government. These research grants are competitive, but we have had students successfully attain them in the past. <https://gpsg.uiowa.edu/grants-for-students>

The Graduate College has a competitive opportunity for research funding for graduate students. <https://grad.uiowa.edu/funding/fellowships/research-grants-arts-humanities-social-sciences>. Please read the information carefully, as receiving one grant might mean that you cannot receive a different grant at the same time (i.e., GPSG grant).

Teaching

Undergraduate Teaching

Our program is responsible for teaching PSQF:1075 *Educational Psychology and Measurement*, a course that is required by the state of Iowa for anyone who will eventually seek K-12 teaching licensure. Each semester we offer a number of sections of the course, some taught by faculty and others taught by our teaching assistants (TAs). Typically, applications are sought in the spring semester for positions the following year.

The TA will have sole responsibility for his/her section(s), which will enroll approximately 45 students. This includes all of the responsibilities of an instructor. TAs may be offered a half- or quarter-time position. A half-time position includes, on average, 20 hours of work per week including teaching two sections of the course. A quarter-time position includes, on average, 10 hours of work per week, including teaching one section of the course.

Prior to being hired as a TA for PSQF:1075, potential applicants are required to enroll for one semester in PSQF:7380 *Practicum in College Teaching* and work with one of the faculty PSQF:1075 instructors. Early in the semester, you will primarily observe and meet with the professor with any questions you have regarding the teaching of the course. You will eventually be the lead teacher with the professor observing your teaching and providing you with areas of strength and suggestions for improvement. Exposure to all aspects of teaching will occur during the practicum. The expectation in the practicum is that the student actively engages in course observation—seeking examples of best practices, understanding the rationale for particular strategies and techniques, and developing pedagogical content knowledge (i.e., how this particular content may be effectively taught). While the practicum student may be familiar with the content prior to the practicum semester, taking new eyes to the content from the perspective of an instructor, the perspective of the student-learner who may have limited prior knowledge, and the interplay between those perspectives, is valuable.

A successful practicum student will take a thoughtful eye to the learning environment during their observation, developing questions, hypotheses, and plausible explanations for the learning and instruction they see taking place. They will make a point to discuss these ideas with the course instructor so to develop their own pedagogical content knowledge regarding the successful teaching of content related to educational psychology. The unsuccessful practicum student will seem uninterested in what is taking place in the classroom, perhaps because they feel they know the content or already know how to teach, and may be busy checking email or doing other personal tasks. These types of behaviors will not result in a positive recommendation for a teaching assistantship.

While completing your teaching practicum in PSQF:1075, if you believe you will be a TA for that class in the future, take the time during that semester to develop your materials for your own teaching. Each week, get a copy of the slides and begin to adapt them to your own potential teaching style. The number one challenge for new TAs for 1075 is preparation time. Working from your adapted slides as you prepare for your first semester is much more efficient than being to adapt slides.

As part of the assistantship for PSQF:1075, the TA is required to engage in professional education and maintain ongoing involvement in activities in preschool and elementary, middle, or secondary schools. While the requirement is called the “40-hour” requirement, the TAs individual requirement is, on average, 4 hours per semester. It is up to the TA to schedule this time and document it.

Qualifications for the position include:

- Successful completion of PSQF:7380, *Practicum in College Teaching*, with one of the faculty PSQF:1075 instructors as supervisor, and received a favorable evaluation from their PSQF:7380 supervisor;
- effective verbal and written communication skills in the English language, and passed the SPEAK test if the student speaks English as a second language; and
- relevant psychology coursework as a graduate or undergraduate student. Previous teaching experience is desirable, as well as completion of PSQF:6217, Seminar in College Teaching.
- K-12 teaching experience is highly desirable.

Application materials, submitted in the spring semester to the LSEP program coordinator, include electronic copies of a statement of interest and qualifications, vita/resume, and graduate and undergraduate transcripts (they can be unofficial versions). Students with previous teaching experience, in this or other courses, should also submit course evaluations.

TA Expectations

PSQF:1075 *Educational Psychology and Measurement* is a foundational course for pre-service teachers, which they are able to take before they are enrolled in the Teacher Education Program. The course is also taken to fulfill a requirement in several other programs across the university. The instructors of the course have an important role in educating those who are interested in becoming teachers and our instructors are expected to adhere to high professional standards. These expectations provide a foundation for guiding your professional development as a future professor or college instructor.

Paid quarter-time assistantships require a *minimum* of 10 hours of work per week. Work during these hours includes developing teaching plans and materials for the course, reviewing readings and other materials to further develop expertise, teaching the course, meeting with students, preparing assessments, and grading student work and providing feedback. In our experience, first-time TAs work more than 10 hrs/wk. While the extensive responsibility for all these course activities may provide some challenges, the tradeoff is that the TAs of PSQF:1075 are given a great deal of autonomy over their courses. In addition, when you apply for a job you will be able to state that you were an instructor for a course, rather than supporting a faculty member.

Teaching this course needs to be a priority in your schedule as a graduate student. Schedule a minimum of 10 hours per week where you will actively work on your course. This includes time for the above-mentioned tasks. These hours should be during what might be considered routine working hours (weekday daytime hours and perhaps a few evening hours). Please share your

work schedule with the course supervisor. You are provided an office space for this work. Include in the 10 hours at least 3 hours per week that are designated as office hours.

If you teach an online section, be sure to dedicate at least 3 hours (the equivalent of a face-to-face class) of your 10 hours to working as an online facilitator of the activities you have provided. Read students' postings/online activities, reflect on them, and post informative responses and feedback. Research indicates that it takes more time to teach a quality online course than a face-to-face course.

Be prepared for class. Make sure class materials are well developed and that you have the expertise you need to address questions in the class and to share information as needed.

Arrive at your classroom before the starting class time. All materials should be ready to go prior to the start of the class session.

Dress and behavior should be professional. When in doubt, business casual is a good choice. Please also refer to the dress guidelines that pre-service teachers must adhere to when in school systems. Clothes should be tidy and fit appropriately and you should be well-groomed. Of course, your personality can show through, but the old adage, "dress for the job you want" or "dress for success" should prevail. You should treat the students respectfully and behave in a way that engenders respect from the students. You may feel like a student yourself, but in the eyes of the undergraduate you are a professor – behave accordingly.

As instructor, you will be assigning grades for your students' work. It is important to be fair, objective, and above all, the grade must reflect the quality of the student work. It might seem like a safe idea to grade easily so that everyone gets an "A." Realize that the semester grade becomes a part of the students' record and must reflect what they can do and what they know given the content. In PSQF:1075, many students are enrolled in our Teacher Education Program. They must be prepared. No one (not that student, their future students, or their future employers) is well served by receiving grades they do not deserve. Be wary of padding students' grades with many "free" points. Think about grades and assessment in terms of reliability and validity. Consider that there should be very few (and many times no) A+s. The numbers of students receiving Ds and Fs should be limited. Students who are in danger of receiving these grades deserve your attention and follow up. These grades typically reflect students who are not turning in work or not showing up for class. If you have questions about grades, please visit with the course supervisor.

You will record student grades in MAUI at the end of the semester. Although there is an "Upload to MAUI" feature in ICON, oftentimes the most reliable process is to hand enter your grades into MAUI (and double check and recheck your entries). If you happen to use the upload feature, double check that the grades uploaded properly and align with the grade that you have determined the student will receive. When posting final grades take great care to ensure that everything is correct before submitting to the PSQF DEO.

Provide timely feedback to students, whether on e-mail questions, papers, exams, etc. For example, e-mail should typically be answered within 24 hours (except weekends), small

assignments should be graded within about three days, and exams and papers should be graded within a week. Be responsive to your students in terms of time and addressing their questions and concerns—without them, you do not have a job!

Conduct a mid-semester evaluation. You may do this via a formal survey or open-ended questions, but the evaluation must allow students to be anonymous. Your evaluation should include questions about current strengths and weaknesses of the instruction, your role in the class, concerns they may have, and prompts for what may help them to be more successful in the class. Share your results from the mid-semester evaluation with the course supervisor.

Teaching evaluations – throughout the semester the course supervisor will visit your class to provide feedback about your teaching. These observations may be announced or unannounced. You may also request an evaluation of your class for a particular class session and the supervisor or another faculty member will try to accommodate this request. The most useful teaching evaluations are informed by the teacher, thus sharing ideas about which you would like feedback with the course supervisor can help you work toward improving your teaching practice.

As part of your assistantship for PSQF:1075, you are required to engage in professional education and maintain ongoing involvement in activities in preschool and elementary, middle, or secondary schools. While the requirement is called the “40-hour” requirement, your individual requirement is, on average, 4 hours per semester. It is up to you to schedule this time and document it. You will find a place in your personal APR to record this information. If you do not have access to this choice in your APR, please contact the LSEP program coordinator.

If you have concerns about your course or about particular students in the course, please contact the course supervisor for help. Problems that go unaddressed can escalate and affect the learning environment for all of the students.

Professional Appearance for Field Experience

Make sure your appearance reinforces your image as a professional at work.

(Gill, V., *The Ten Commandments of Professionalism for Teachers: Wisdom from a Veteran Teacher*, Thousand Oaks, CA: Corwin Press, 2005)

Suggestions for professional appearance based on comments received from building administrators and cooperating teachers:

- Dress neatly; clean, not too wrinkled, and not too tight
- Never sexy or provocative
- No spaghetti straps or low-cut tops
- Tattoos covered
- No visible pierced areas except ears
- No midriff showing (either front or back)
- No caps or head covering (unless for medical or religious reasons)
- No gum
- No underwear showing
- No flip flops

- Males' shirts tucked in and beards trimmed or clean shaven
- No blue jeans (unless during a school sanctioned "casual day")
- No eating or drinking in room when students are not permitted to eat or drink

Ongoing Involvement in PreK-12 Schools

In accordance with Chapter 79 of the Iowa Code, effective January 14, 2015, all faculty members involved in teacher preparation must engage in professional education and maintain ongoing involvement in activities in preschool and elementary, middle, or secondary schools. These activities will include at least 40 hours of teaching at the appropriate grade level(s) during a period not exceeding five years (<https://www.legis.iowa.gov/docs/ACO/IAC/LINC/12-10-2014.Rule.281.79.12.pdf>). This requirement applies to all those who are involved with instructing, guiding, or providing feedback to teacher candidates regarding the teaching and learning process, including adjunct faculty and field work supervisors (practicum and student teaching). The College of Education is required to maintain a record of the professional activities of all faculty, adjuncts, and graduate assistants involved in the Teacher Education Program to demonstrate the fulfillment of this requirement.

Evaluation of Student Progress

At the end of the spring semester, or soon after, the faculty of the Learning Sciences and Educational Psychology program meet to discuss student progress. When reviewing your academic progress, they will consider coursework, final portfolios/projects, research assistantships, second-year project, comprehensive exam, and dissertation work, as appropriate for the student's degree program and year in program. Following this meeting, students will receive a letter via email reporting the results of the review.

The following criteria will be used, as they link with student learning outcomes as described for the Department of Psychological and Quantitative Foundations.

- Specific knowledge and skills via course work and 3.0 GPA or higher (Goal 1)
- Research, design, and teaching as appropriate (Goal 2 & 3)
- Ethics, professional development, service to the profession (Goal 4)

Psychological and Quantitative Foundations Learning Outcomes

1. Graduate students will gain course specific knowledge and skills as required to perform well in their specialties (as demonstrated by completing their required courses in their specialty/major area with a 3.0 GPA or higher).

2. Graduate students will demonstrate integrated substantive knowledge and skills that can be applied to solve novel professional level problems (as demonstrated by completing their comprehensive examinations satisfactorily and by completing their thesis proposals with committee approval).

3. Graduate students will demonstrate required clinical practice skills and researcher autonomy (as demonstrated by satisfactorily completion of all required practicums and/or internships and required thesis defenses/article submissions as appropriate for their degrees).

4. Graduate students will demonstrate initial engagement with and commitment to professional ethics, professional development and life-long learning, and service to the profession (as demonstrated by participation and engagement in the appropriate state, regional, and national organizations as appropriate for their degrees).

General performance indicators include:

- Making exceptional progress (seldom conferred)
- Making reasonable progress (typical)
- Needs improvement (can also be noted as “inadequate progress” depending on the situation)

As a graduate program, students who are making inadequate progress, as reflected in coursework GPA, maybe removed from the program given Graduate College guidelines. These guidelines are available at: <https://grad.uiowa.edu/academics/manual/academic-program/section-iv-academic-standing-probation-and-dismissal>

A student, for reasons which are both extremely serious and unusual in nature (e.g., serious violation of ethical codes), may be terminated from the program without a probationary period. In this case, the faculty would hold a formal review of the student prior to the termination action and would follow the guidelines presented by the *Manual of Rules and Regulations of the Graduate College*.

Supplementary review procedures

Prior to registering each semester, each student will meet with his or her advisor to discuss the student's progress for the prior semester and plans for the upcoming semester. After that discussion, the advisor will authorize the student to register for the following semester.

Academic Portfolio of Progress

Beginning fall 2021, each student is provided access to a shared folder that serves as a repository for materials to support the students' success and evaluation. Documents included in the folder will serve as a form for tracking academic progress, as well as an opportunity for students to reflect on their professional goals. These documents will be reviewed by the faculty during the student academic review period. Students who matriculated in the program prior to the fall of 2021 will be provided an abbreviated reflection sheet to complete.

The Academic Portfolio of Progress is made available to students when they enter the program. It is a dynamic document. Please take care of keep it well formatted and clear. You will begin this document at the start of your graduate work for your Educational Psychology PhD. At a minimum, you will add to the document prior to advising time each semester, at the end of each academic year (**by the end of finals week of the semester**), in the semester prior to taking their comprehensive exam, and in the semester in which you defend your dissertation (prior to the defense date). Please note that you should add to this document periodically, just as you would keep a vita updated. Do not wait until a due date – rather, add to it as you do things and have new ideas that affect the direction of your work in the program.

Student Complaint Procedures and University Policies/Statements

Student Complaint Procedures

Should the situation occur that you may need to submit a formal complaint concerning faculty, staff, or policies in the College of Education, the Graduate College, and the University of Iowa, there are specific procedures to follow. In all cases, the goal is the resolution of problems. Problems usually result from a lack of communication. Please refer to the following website (<https://grad.uiowa.edu/academics/manual/academic-grievance-procedure>) for the latest information registering a complaint.

Free Speech and Expression

The University of Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We are committed to open inquiry, vigorous debate, and creative expression inside and outside of the classroom. Visit the [Free Speech at Iowa website](#) for more information on the university's policies on free speech and academic freedom.

Accommodations for Students with Disabilities

The University is committed to providing an educational experience that is accessible to all students. If a student has a diagnosed disability or other disabling condition that may impact the student's ability to complete the course requirements as stated in the syllabus, the student may seek accommodations through [Student Disability Services](#) (SDS). SDS is responsible for making Letters of Accommodation (LOA) available to the student. The student must provide a LOA to the instructor as early in the semester as possible, but requests not made at least two weeks prior to the scheduled activity for which an accommodation is sought may not be accommodated. The LOA will specify what reasonable course accommodations the student is eligible for and those the instructor should provide. Additional information can be found on the [SDS website](#).

Absences for Religious Holy Days

The University is prepared to make reasonable accommodations for students whose religious holy days coincide with their classroom assignments, test schedules, and classroom attendance expectations. Students must notify their instructors in writing of any such Religious Holy Day conflicts or absences within the first few days of the semester or session, and no later than the third week of the semester. If the conflict or absence will occur within the first three weeks of the semester, the student should notify the instructor as soon as possible. See [Operations Manual 8.2 Absences for Religious Holy Days](#) for additional information.

Classroom Expectations

Students are expected to comply with University policies regarding appropriate classroom behavior as outlined in the [Code of Student Life](#). While students have the right to express themselves and participate freely in class, it is expected that students will behave with the same level of courtesy and respect in the virtual class setting (whether asynchronous or synchronous) as they would in an in-person classroom. Failure to follow behavior expectations as outlined in the [Code of Student Life](#) may be addressed by the instructor and may also result in

discipline under the [Code of Student Life](#) policies governing E.5 Disruptive Behavior or E.6 Failure to Comply with University Directive.

Civil Rights at the University of Iowa

Students who may have concerns about their civil rights (e.g., sexual misconduct, disabilities, discrimination) are encouraged to contact the Office of Civil Rights Compliance. Relevant information about protections and processes can be found on their website:

<https://ocrc.uiowa.edu/>.

Mental Health

Students are encouraged to be mindful of their mental health and seek help as a preventive measure or if feeling overwhelmed and/or struggling to meet course expectations. Students are encouraged to talk to their instructor for assistance with specific class-related concerns. For additional support and counseling, students are encouraged to contact University Counseling Service (UCS). Information about UCS, including resources and how to schedule an appointment, can be found at <http://counseling.uiowa.edu>. Find out more about UI mental health services at: <http://mentalhealth.uiowa.edu>.

Basic Needs and Support for Students

Student Care & Assistance provides assistance to University of Iowa students experiencing a variety of crisis and emergency situations, including but not limited to medical issues, family emergencies, unexpected challenges, and sourcing basic needs such as food and shelter. More information on the resources related to basic needs can be found at: <https://basicneeds.uiowa.edu>.

Sharing of Class Recordings

Some of the sessions in this course may be recorded or live-streamed. Such recordings/streaming will only be available to students registered for this class. These recordings are the intellectual property of the faculty and they may not be shared or reproduced without the explicit, written consent of the faculty member. Further, students may not share these sessions with those not in the class or upload them to any other online environment. Doing so would be a breach of the Code of Student Conduct, and, in some cases, a violation of state and federal law, including the Federal Education Rights and Privacy Act (FERPA).

Financial Assistance

The faculty of the Learning Sciences and Educational Psychology program strive to provide financial aid to as many students as possible. The major sources of funding are teaching and research assistantships. In addition, students frequently obtain professionally-relevant employment in the Iowa City area. We encourage all students to consult with their advisors prior to taking employment. In general, financial aid in the form of teaching and research assistantships is available to students for no more than two years of work toward an M.A. degree and for no more than four years of work toward a PhD degree. General information about financial aid for graduate students may be found at the [UI Graduate Admissions' website](#).

Research and Teaching Assistantships

Each year, the program is able to support a number of students as research and teaching assistants. In general, research assistants are supported with funds that faculty members obtain through external grants and contracts. Thus, the number of research assistantships available fluctuates from year to year. Generally, the students appointed to these assistantships have been in the program long enough to acquire the skills that enable them to contribute to the research program. The duties of teaching assistants range from grading to taking full responsibility (with appropriate supervision and support) for teaching a section of a course. Again, first-year students rarely have the skills and background necessary for appointment as teaching assistants. Students are encouraged, through coursework and other experiences, to gain research and teaching skills that will make them eligible for appointment to these assistantships. In most years, some research assistantship or fellowship funds are available especially to support first-year PhD students.

Assistantships for a 25% time or greater appointment qualify the student assistant for in-state resident tuition, which is substantially lower than out-of-state tuition. Compensation for student assistants also includes a health-care plan and, in some cases for students with children under 24 months of age, a modest contribution toward child-care costs.

Fellowships

Several Fellowships are available in addition to these assistantships. These include Graduate College Iowa Recruitment. The University of Iowa Fellowship involves a five-year waiver of tuition, plus a stipend. The faculty will review your materials when complete and will forward to you the necessary forms to enable you to apply to either of these fellowships for which you may be qualified.

Support for Travel to Conferences

PhD students in the Learning Sciences and Educational Psychology program are encouraged to submit completed research for presentation at a conference. If a paper is accepted, the student will incur the costs of the conference including travel to and from, conference registration, housing, and per diem. There are a number of opportunities available for securing funding for conferences.

Each spring, as long as funds are provided through the department, the Learning Sciences and Educational Psychology program will provide travel funds for students who have presented at a

conference, or are accepted to and plan to attend, during each fiscal year. Information for this travel award must be provided at the time it is required by the program coordinator. Amounts of funding vary from year to year.

Within the College of Education, the Audrey Qualls Travel Award and the Office of the Dean Graduate Student Travel Award provide opportunities for travel funding:
<https://education.uiowa.edu/research/grants-and-research-services-center/student-grant-funding>.

In addition, the Graduate College and the Graduate Student Senate provide opportunities to apply for support for presenting at conferences: <https://gss.grad.uiowa.edu/funding/gss-travel-funds>.

Hints for Seeking Funding:

Make the application your best work. Review to make sure it makes sense, has no grammatical or spelling errors. Write in a way that someone who doesn't know about your work can understand it. Present yourself as a professional.

Apply for anything that makes sense, even if the alignment seems borderline.

Adapt to make the award fit. Take the time to make the case that you are a good fit given how you will use the funding. At times you might have to add something additional to your work to make your request be better aligned. For example, the College of Education Graduate Student Research Award says that it will support travel for data collection. You could potentially make a case for conference travel to present but think about what you might do at that conference that would be beyond the presentation. Could you meeting some someone who would inform your research? Could you attend a workshop that could enhance your analytic skills? (these are just ideas, and including them does not assure that they will be funded). Think broadly about how you can create a situation that would all the funding request to make sense given what the award typically funds.

Start early. It's important to allow enough time for any paperwork to be completed. This is particularly important if you need a letter of support from a faculty member. Oftentimes, they may need a week or more to have time to write a thoughtful supportive letter.

Other Resources and Useful Information

Graduate student support guide through ISLS. <https://www.isls.org/graduate-student-support-guide/completing-a-phd>

University of Iowa library resources. <https://guides.lib.uiowa.edu/edgrad/welcome>

Free download of *How People Learn* (recommended reading prior to your first semester in the program). <https://www.nap.edu/catalog/9853/how-people-learn-brain-mind-experience-and-school-expanded-edition>

APA writing style (7th edition) from the Purdue OWL (Online Writing Lab):
https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_style_introduction.html

Editing services through the University of Iowa Design Center (dissertation fee is \$50/hour).
<https://designcenter.uiowa.edu/editing-services>

University of Iowa Graduate College supports. <https://grad.uiowa.edu/grad-success-appointments>

Professional Organizations and Conferences

American Educational Research Association (AERA) <https://www.aera.net/>

Student dues: Any graduate student may be granted graduate student member status with the endorsement of a voting member who is a faculty member at the student's university.

Graduate students who are employed full time are not eligible. Graduate student membership is limited to 7 years. \$65/calendar year.

Journals included: AERA publishes seven highly respected, peer-reviewed journals that feature the field's leading research, including:

- *AERA Open*
- *American Educational Research Journal*
- *Educational Researcher*
- *Review of Educational Research*
- *Educational Evaluation and Policy Analysis*
- *Journal of Educational and Behavioral Statistics*
- *Review of Research in Education*

International Society of the Learning Sciences (ISLS) <https://www.isls.org/>

Student dues: \$60/year

Journals included: *the Journal of the Learning Sciences* (JLS), and *the International Journal of Computer Support for Collaborative Learning* (ijCSCL)

American Educational Communications and Technology (AECT) <https://www.aect.org/>

Student dues:

Student Membership (Includes a one-year subscription to TechTrends): \$83.00/yr USD

Student Comprehensive Membership (Includes a one-year subscription to TechTrends & ETRD): \$128.00/yr USD

Journals included: The association produces two bimonthly journals:

- *Educational Technology Research*
- *Development and TechTrends*

American Psychological Association (APA) – Division 15 – Educational Psychology (Note: you can join a division without joining APA) <https://apadiv15.org/>

Student dues: \$15/year

Journals included: *Educational Psychologist* (quarterly)

Conferences

American Educational Research Association (AERA) Annual Conference

<https://www.aera.net/Events-Meetings>

The American Educational Research Association (AERA), founded in 1916, is concerned with improving the educational process by encouraging scholarly inquiry related to education and evaluation and by promoting the dissemination and practical application of research results.

Time: typically held in April of each year

Proposal deadline: typically due mid-July of each year

Chinese American Educational Research and Development Association (CAERDA) Annual Conference (held concurrently with AERA) <http://www.caerda.org>

The Chinese American Educational Research and Development Association (CAERDA) was founded on September 28, 1992 to promote excellence in education for all students, particularly among Chinese and Chinese Americans. CAERDA, a non-profit, non-political, international organization, emphasizes and pursues educational research and development

Time: typically held in April of each year

Proposal deadline: typically due November or December of each year

Mid-Western Educational Research Association (MWERA) Annual Conference

<https://www.mwera.org/>

The mission of the Mid-Western Educational Research Association is threefold: 1) to disseminate educational research conducted in the central states and provinces of North America; 2) to promote a collegial research culture in the region; and 3) to provide a forum for mentoring the research skills of graduate students and junior faculty members.

Time: typically held in late October of each year

Proposal deadline: typically due May or June of each year

The International Conference of the Learning Sciences (ICLS) (held bi-annually, alternates with CSCL) <https://www.isls.org/conferences/icls>

The International Conference of the Learning Sciences (ICLS), first held in 1992 and held bi-annually since 1996, hosts keynotes, symposia, workshops, panels, submitted paper sessions, poster sessions, and demos covering timely and important issues and reporting research findings across the entire field of the learning sciences. Each conference has had invited keynotes and sessions centered on timely themes. Visit the links to past conferences to discover each conference's focus.

Time: typically held in late June of every other year

Proposal deadline: typically due late November of each year for papers, posters, and symposia

The International Conference on Computer-Supported Collaborative Learning (CSCL)
(held bi-annually, alternates with ICLS) <https://www.isls.org/conferences/cscl>

The International Conference on Computer-Supported Collaborative Learning (CSCL), held bi-annually since 1995, focuses on issues related to learning through collaboration and promoting productive collaborative discourse with the help of the computer and other communications technologies. Each conference has included keynotes, symposia, workshops, panels, submitted papers, posters, and demos covering timely and important issues of interest and research findings important to the CSCL community.

Time: typically held in mid-June every other year

Proposal deadline: typically due mid-November of each year for papers, posters, and symposia

Learning Sciences Graduate Student Conference (LSGSC)

[Website changes based on hosting institution]

The Learning Sciences Graduate Student Conference (LSGSC) is a convening for emerging voices in the learning sciences and related fields to (1) engage with and iterate on work that focuses on studying and designing for learning, and (2) build community across campuses and among graduate students and faculty. We are especially interested in works-in-progress and first-time presenters. Each year, students share work in its various stages of completion, including conjectured designs, theoretical frameworks, preliminary findings, and manuscripts being prepared for submission.

Time: typically held in mid-October

Proposal deadline: typically due early June

Foundations of Digital Games (FDG) Conference (held annually)

<http://www.foundationsofdigitalgames.org/>

The Foundations of Digital Games conference series seeks to promote the exchange of information concerning the scientific foundations of digital games, technology used to develop digital games, and the study of digital games and their design, broadly construed.

Time: typically held in August of each year

Proposal deadlines: very flexible across years

Association for Educational Communications and Technology (AECT) Conference (held annually) <https://www.aect.org/events/convention/proposals>

The Association for Educational Communications and Technology (AECT) is an international organization that values diversity of thought, culture and people whose activities are directed toward improving learning. AECT has become a major organization for those actively involved in instructional design and the development of a systematic approach to learning. It provides an international forum for the dissemination and exchange of ideas among its members and target audiences; it is the national and international advocate for the

improvement of instruction; and it is the most widely recognized source of information concerning a wide range of instructional and educational technology.

Time: typically held in October or November of each year

Proposal deadline: typically due January or February of each year

Local/Regional Conferences

Jakobsen Conference - organized by the Graduate Student Senate (held annually)

<https://gss.grad.uiowa.edu/jakobsen-conference>

The James F. Jakobsen Graduate Conference is an event unique to the University of Iowa. It provides a well-attended public forum for oral and poster presentations.

Time: typically held in early spring of each year

Proposal deadline:

Place: the Iowa Memorial Union (2018 & 2017)

Appendix A

MA Capstone Projects and PhD 2nd Year Design Projects

Outcome:

MA students – capstone project that is used as the foundation for the oral comprehensive examination through which the student demonstrates depth of understanding of concepts and topics in the learning sciences and educational psychology.

PhD students – position the student to engage in design work that could be useful for their comprehensive exam, pre-candidacy research, and dissertation.

MA Capstone Project Introduction

In our MA program, we consider design as a cornerstone of our work in the learning sciences and educational psychology. Design thinking and skills prove vital for careers involving learning design and educational technology. Therefore, we encourage our MA students to choose a capstone design project to complete our masters' degree program. This design project may be completed as a practicum or internship experience, in which they do design work with a client, or the project may be done without a client. The difference between an internship and a practicum experience is often about being paid. Typically, a practicum experience is unpaid and an internship is paid for by the organization that has hired the intern. It is the responsibility of the student to find and arrange for the opportunity, although at times the advisor may have sources and suggestions that help secure the internship or practicum.

In lieu of a design project, MA students may choose to complete a portfolio for their capstone project or a traditional comprehensive exam to complete their degree (see LSEP Handbook for a description). Examples of MA portfolio and design projects are housed in the LSEP Design Lab (S348 LC).

PhD Design Project Introduction

In our PhD program, we consider design as a foundational pillar of our discipline and an often necessary first step for developing a viable research project. Design thinking and skills act as tools that allow scholars to gain traction on research studies. In the design process, students may address preliminary tasks that lead to successful research studies because students unpack the rationale for their design based upon empirical research in the learning sciences and related disciplines. Thus, we require a second-year design project as the first major milestone in our PhD program.

For PhD students, choices for your second-year design project include:

1. Developing further an instructional design project completed in a course (e.g., PSQF:6205, PSQF:6214, or PSQF:6215). This might mean iterating on, expanding upon and/or conducting additional usability testing on the design. If a class project is expanded to meet the design project requirement, it must show substantial additional work and new learning beyond what was developed and graded in the course in which the project was initially developed.
2. A new project involving the design and usability testing of an instructional intervention or learning environment that you plan to use for subsequent research (e.g., your pre-

- candidacy research project, dissertation, or a research project with your advisor).
3. The design and piloting or validation of a survey, questionnaire, or other data collection tool for later use in your research.
 4. Another project of similar scope discussed with and approved by your advisor.

Useful Classes

Whether an MA or PhD student, during your first and second year of study you have taken courses in which you have engaged in processes, content, and assignments that will inform how you complete this independent project. Assignments from any of our LSEP courses may inform your work. Consider PSQF:6214 *Design of Learning Environments*, PSQF:6205 *Design of Instruction*, and PSQF:6215 *Online Teaching: Design and Facilitation* for ideas about processes and scope of projects. Consider that courses such as PSQF:6216 *Tools and Utilities for Online Learning* and PSQF:6211 *Universal Design and Accessibility Online* provide potential ideas for a project as well as details about best practices in design. Depending upon the project you select, PSQF:6203 *Tools and External Representations* or PSQF:6281 *Cognitive Theories* could possibly serve as a platform for your design project. If your project will include instrument development, specific courses in Educational Measurement and Statistics, beyond statistics and research methods, will be useful.

Tasks involved for both MA and PhD Project

- A. Attend the LSEP Design and Research seminar. The seminar is designed to help students make progress on their independent work, get feedback and support from faculty and their peers, and understand elements of the requirements for their independent work.
- B. Planning
 1. Discuss your idea(s) with your advisor.
 2. Will you have a real client? If so, then obtain a letter of agreement from them that indicates they have looked at/discussed your plan with you and agree to be a part of it.
 3. Decide the timeline.
 4. Register for PSQF:6299 *MA Portfolio/Internship/Practicum* over one or two semesters depending on your timeline. The total credits to register for are: MA – 3 credits; PhD – 2 credits. When you enroll in this course you choose how many credits (allowing you to divide the credits across semesters) and a faculty member – choose your advisor for this unless you and your advisor have decided otherwise.
 5. Provide a brief project proposal to the adviser. This is a one- to two-page document including the following:
 - a. The objective or goal that the project will address. This may be some type of problem or issue that comes from the literature or that you have noticed and have interest in.
 - b. The content area that will be included (i.e., if you are proposing a design through which someone will learn something, what's the content topic?).
 - c. The target learners (if an instructional design)
 - d. Mention of your client (if you have one).
 - e. The theoretical rationale for your design (brief)
 - f. A timeline of project milestones.
 - g. For MA students, describe how this project addresses your professional goals.
 - h. For PhD students, describe how you currently see this project informing your potential research trajectory.

6. No IRB required (and in fact is discouraged as this is not a research project)
 7. PhD students, please note that your project should not be considered a “throw away” project – it should not merely be an activity to check off the requirement. Your project work should be a step in a larger trajectory. Your advisor will help you think through later stages that you might engage in after this project is completed. Your advisor will provide critical advice regarding the viability of your full research and development trajectory. In other words, as this project may be an important piece of future work, we want to ensure that your final goal in terms of research and development of innovation can be completed during your time in graduate school with the resources at your disposal.
- C. Receive advisor approval of your proposal.
- D. Execution
1. Design your project.
 - a. Fully articulate your analysis (as needed)
 - b. Fully articulate your theoretical framing
 - c. Fully articulate your design specifications and principles embodied in your design
 - d. Fully articulate and design your evaluation processes and what next steps would be given what you found out.
 2. Develop and pilot the design
 3. Check in regularly with your advisor, updating them on your progress
- E. Deliverables
1. A document describing your design and your design process
 - a. Includes important front-end components such as rationale and analysis processes that were important in the design.
 - b. Describes the design specifications and principles embodied in your design
 - c. Mobilizes course readings or other independent readings
 - d. Details the kind of testing that you engaged in to address the viability of your design to meet the stated goals.
 - e. A reference list
 2. The product could be
 - a. A low-fidelity prototype (e.g., paper prototype)
 - b. A design sketch represented in diagrammatic form
 - c. Discuss other viable options with your advisor (e.g., designing a learning activity as opposed to designing a material artifact)
 3. This document will be detailed (see the examples in the LSEP Design Lab). You might think about this document as an enhanced class report (consider the documentation you provide for a project in 6205 or 6214), with added depth on theoretical foundations of your design and also substantial support from the literature.
 4. MA students - The information in this document should demonstrate your learning across the program.
- F. Obtain feedback as needed – all students should plan for multiple rounds of feedback if necessary.
- G. Final matters for completing the design requirement
1. MA students
 - a. complete the comprehensive exam and graduation paperwork in the final semester
 - b. schedule oral exam with committee.
 - c. provide your deliverables to committee at least 2 weeks prior to the comps date

- d. Talk with your advisor about what will happen at your oral exam
2. PhD students – submit your final materials to your advisor at least 2 weeks prior to presenting at the Design Expo and Research Symposium. Your advisor will be evaluator of your materials (rather than a committee).
3. All students – present your work as a poster (and if applicable usable prototype) at the Design Expo and Research Symposium (Friday of week 14 of the semester).

Design Project Outline

- I. **Analysis and Problem Framing**
 - a. **Need for Instruction** - Identify an Instructional Design Problem (from literature or personal experience)
 - b. **Prior Approaches** - How have others attempted to address the problem you're solving? What has been successful or unsuccessful there? Where are the gaps in what we know or have previously tried (*particularly for PhD students, looking to use their design in research*)?
 - c. **Learners and Motivation** - Who are your learners, what do they already know, and what motivates them)
 - d. **Context** - Where will instruction take place, note social, material, and cultural context
 - e. **Content & Learning Objectives** - What content will you teach? Where will you get information about that content? What are your learning objectives?
- II. **Theoretical/Design Framework** What theoretical framework will you use to inform your design? Describe framework with citations. Describe, in general, how this framework translates into design principles
- III. **Design**
 - a. **Application of Theoretical/Design Framework** - How will you apply your framework to inform your design? Cite any relevant prior work using this framework in areas related to your design
 - b. **Design Decisions** – What design decisions follow from your analysis and theoretical/design framework? Be as thorough and specific as possible identifying at least five decisions across the following categories:
 - i. **Strategies** - Describe and cite instructional strategies (ideally grounded in your theoretical/design framework) that you will use to structure instruction. Please consider not just how learners will learn but also how you will motivate them and how instruction will be made relevant to them.
 - ii. **Instructional Sequence** - In what order will concepts/skills be presented or explored? If it won't be linear, explain this and explain how learners will explore the conceptual territory.
 - iii. **Message and Materials Design** - Describe (with relevant figures/appendices) what instruction will look like and how information will be presented.
 - iv. **Tools** - What digital or tangible tools will you use for development or instruction and how?
- IV. **Evaluation**

- a. **Evaluation Plan** – How are you evaluating the efficacy of your design? Who are you testing it with? Where? When? What data are you collecting and how are you evaluating it?
 - b. **Evaluation Instruments** – Are you using any surveys, interview protocols, etc. to evaluate your design? If so, describe them and include them as figures, tables, or appendices.
 - c. **Findings** – What were the results/findings from your evaluation?
- V. **Conclusions and Future Directions**
- a. What worked and what didn't and why?
 - b. How would you or will you iterate on your design in the future to address any problems that came up?
 - c. How do your findings speak back to prior literature and theory? What have we learned that we didn't know before? How does what you found from evaluation fit with prior theory?

Additional Guidelines

I. Timeline

- a. Generally, these projects should take two semesters to complete, so plan ahead.
- b. Make a plan with your advisor for how you're going to pace the work
- c. As with the Design of Instruction course project, you should plan to have your analysis, theoretical/design framework, design, and an evaluation plan written up and shared with your advisor BEFORE you implement/test your design. Results of evaluation, conclusions and future directions, as well as final document edits can take place afterward.
- d. For MA students, check the graduate college deadline for comprehensive exam completion (usually in mid-April)

II. Deliverables

- a. **Document:** You should turn in a document hitting the points in the outline above to your advisor (PhD students) or your committee (MA students) upon completion of your project (in addition to any drafts of sections shared with your advisor along the way).
 - i. Suggested length for this final document is somewhere between a long conference paper and a journal article (6000-15000 words). Know yourself and how concise your writing is though. Quality matters more than quantity.
 - ii. Please use APA formatting for this document.
- b. **Poster Presentation:** Plan to present your project at the LSEP Research and Design Expo in the semester you complete it.

Design Project Timeline Example (MA final project / PhD design project)

A design project will often take more than a single semester (of course there are exceptions). The length of time is dependent upon if you have thought about your project throughout some of your course work, how it links with your future goals (e.g., employment, research, etc.), and if you've developed an understanding of what is involved in a design project prior to beginning your project (i.e., have appropriated a process in your design classes).

You may browse examples of design projects in S348 LC (the Learning Sciences Lab). Note that all of the binders do not include design projects, some are comprehensive learning portfolios. These learning portfolios often include design projects with them as final course assignments. Examples of design projects that are not part of portfolios include numbers: 22, 32, 33, 34, 35, 36, and 37.

What follows is a general timeline of personal, program, and university due dates to help you plan your work. The schedule assumes a fall/spring sequence, but it could be adapted to a spring/fall sequence as needed. Please note that most of these are general suggestions (the exceptions: the University paperwork requirements for MA students). Your advisor will be providing you feedback to improve and polish your work along the way. Please be mindful of their schedules and time to allow this process to work for both of you.

Fall semester

Prior to the semester	Have thought about your idea for your design project. Your idea may come from assignments you've had in classes that you would like to further develop, teaching or other professional development opportunities that you would like to improve, learning/instructional components that come to the forefront following a pilot study you've conducted, ideas from working with your advisor or another faculty members research or instruction, learning/instructional components that you may need for a future research study, or any other prompt! Write up a brief paragraph about your idea – what the topic is, what you believe will be designed, and who the design benefit.
Week 1	Meet with your advisor, sharing your paragraph that includes your basic idea. Get feedback and approval to move forward.
Week 4	Provide a full outline for the design project to your advisor. This is only a a few page documents but makes clear that you know the steps that you will need to accomplish as you work through your project. For example, what analyses are necessary? Where will you find your analysis data? Who will your learners be (or their proxies) and how you will have access to them? What will your theoretical framework be? It's too early to <i>make</i> your design decisions but make clear that you will know what kind you will make in your outline. Indicate that you know you will need an evaluation plan. Finally – include a timeline for your project with actual dates!
Week 8	Analysis document due to your advisor.

Week 12	Theoretical framework and design decisions due to your advisor.
Finals week	Mockup of prototype of design and evaluation plan to your advisor.

Spring Semester

Week 1	Update your advisor on progress made over the break. At this point, you should be ready to pilot your project with the learners. That means that your prototype is ready to go. MA students , visit with your advisor about who your 3-faculty examining committee will be.
Week 4	Pilot completed (of course, this due date might vary depending on when you have access to your learners and how much time your intervention spans).
Week 6	If you are an MA student , apply for graduation.
Week 8	Draft of results including proposed changes for revision (based on evaluation results and literature/best practice). Please note that you do not have to undertake the proposed revisions for the completion of your design project, you just need to thoughtfully describe what they would be. This document should be a <i>full</i> design document that includes all sections completed earlier with changes that were requested. Early submissions are appreciated so that there is ample time for feedback and potential revisions. If you are an MA student , complete the paperwork for the non-doctoral final exam.
When appropriate	MA students – Given advisor approval of your work, schedule your final exam with your committee members (When 2 Meet works well for this). Then, at least two weeks prior to your scheduled final exam, provide your advisor-approved copy of your full design document to your committee. Provide both a PDF and a Word document.
Week 12	MA students – last day to hold final exam.
Week 14	Present your work at the LSEP Design Expo.
Finals week	Provide final copy of your design document. This will allow your advisor to post your grade for PSQF:6299. This copy will be printed and placed in the binder in S348 LC for other students to review.

Appendix B

Learning Sciences & Educational Psychology PhD Comprehensive Exam Reading List

August 2023

The following list of readings is organized by the three key knowledge pillars of our program. Within each pillar there are a number of readings that may be useful in developing your understanding of that pillar. Realize that pillars are broad and within each pillar, the articles could be further sorted. It's important that you take the time to develop an understanding of how the articles interact together to represent key elements and sub-elements of the fields of learning sciences and educational psychology.

These readings provide a backbone of information for the general areas of the LSEP PhD comprehensive examination. While we provide this list and will use it for comprehensive exams, our expectation is that you consider the list as a foundation for building understandings about concepts that define our field. That said, adding other readings to supplement your understanding will also be important.

Remember that in answering an examination question and in conversation with others, you should (generally) be able to point to researchers and theorists whose ideas you are sharing, aligning with, or disagreeing with. In other words, learn their names and also have a general idea of the year in which the work was published to help place it in historical context!

You will find that many of these readings were included in your coursework. Others may be new to you. If you have trouble finding an article, please contact your advisor.

Cognition

- Brainerd, C. J. (2003). Jean Piaget, Learning Research, and American Education. In K. Harris, J. Brophy., G. Sinatra, & J. Sweller (Eds.). *Educational Psychology: A Century of Contributions* (pp. 251-288).
- Bredo, E. (2006). Conceptual confusion and educational psychology. *Handbook of educational psychology*, 2, 43-57.
- Bruning, R. H., Schraw, G. J., Norby, M. M., & Ronning, R. R. (1999). Long-term memory: Structures and models. In *Cognitive psychology and instruction* (4 th ed.) (Chapter 3, pp. 36-64)
- Campione, J. C., Brown, A. L., & Connell, M. L. (1988). Metacognition: On the importance of understanding what you are doing. In C. Randall I. & E. A. Silver (eds.), *The teaching and assessing of mathematical problem solving, Vol. 3. Research agenda for mathematics education* (pp. 93-114). Hillsdale, NJ, England; Reston, VA, US: Lawrence Erlbaum Associates, Inc; National Council of Teachers of Mathematics.
- Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology*, 49(1), 14-23.
- DeLoache, J. S. (2000). Dual representation and young children's use of scale models. *Child Development*, 71(2), 329-338.
- diSessa, A. A., & Sherin, B. L. (1998). What changes in conceptual change?. *International Journal of Science Education*, 20(10), 1155-1191.
- Driscoll, M. P. & Burner, K. (2022). *Psychology of learning for instruction* (4th ed.). Boston: Pearson

- Elby, A., & Hammer, D. (2010). Epistemological resources and framing: A cognitive framework for helping teachers interpret and respond to their students' epistemologies. *Personal epistemology in the classroom: Theory, research, and implications for practice*, 4(1), 409-434.
- Gentner, D. (2003). Why we're so smart. In *Language in Mind* (Gentner, D. and Goldin-Meadow, S., eds), pp. 195-235, MIT Press.
- Goldstone, R. L., Landy, D. H., & Son, J. Y. (2010). The education of perception. *Topics in Cognitive Science*, 2(2), 265-284.
- Greeno, J. G., Collins, A., & Resnick, L. (1996). Cognition and learning. In D. Berliner & R. Calfee (Eds.), *Handbook of Educational Psychology* (pp. 15-46). New York: Simon and Schuster Macmillan.
- Kahneman, D., & Klein, G. (2009). Conditions for intuitive expertise: a failure to disagree. *American Psychologist*, 64(6), 515.
- Kellman, P. J., & Massey, C. M. (2013). Perceptual learning, cognition, and expertise. In *Psychology of learning and motivation* (Vol. 58, pp. 117-165). Academic Press.
- Mayer, R.E. (2009). *Multimedia learning. 2nd ed.* Cambridge, UK: Cambridge University Press.
- Miller, G.A. (2003). The cognitive revolution: A historical perspective. *Trends in Cognitive Sciences*, 7(3), 141-144.
- Ohlsson, S. (2012). The problems with problem solving: Reflections on the rise, current status, and possible future of a cognitive research paradigm. *The Journal of Problem Solving*, 5(1), 7.
- Ortony, A. (1975). Why metaphors are necessary and not just nice. *Educational Theory*, 25(1).
- Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher*, 27(2), 4-13.
- Sherin, B. L., Krakowski, M., & Lee, V. R. (2012). Some assembly required: How scientific explanations are constructed during clinical interviews. *Journal of Research in Science Teaching*, 49(2), 166-198.
- Smith III, J. P., diSessa, A. A., & Roschelle, J. (1994). Misconceptions reconceived: A constructivist analysis of knowledge in transition. *The Journal of the Learning Sciences*, 3(2), 115-163.
- Spencer, S. J., Logel, C., & Davies, P. G. (2016). Stereotype threat. *Annual Review of Psychology*, 67, 415-437.
- Tobias, S. (2006). The importance of motivation, metacognition, and help seeking in web-based learning. In H.F. O'Neil & R.S. Perez (Eds.), *Web-based learning: Theory, research and practice*. Mahwah, NJ: Erlbaum.
- Vygotsky, L. S. (1980). *Mind in society: The development of higher psychological processes*. Harvard University Press. [Chapters 3 & 4]
- Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review*, 9, 625-636.

Context

- Anderson, J., Reder, L., & Simon, H. (1996). Situated Learning and Education. *Educational Researcher*, 25(4), 5-11.
- Arnseth, H. C. (2008). Activity theory and situated learning theory: Contrasting views of educational practice. In *Pedagogy, Culture & Society*, 16(3), 289-302.

- Bang, M. & Medin, D. (2010). Cultural processes in science education: Supporting the navigation of multiple epistemologies. *Science Education*, 94, 1008–1026.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1) (pp. 32-42).
- Cole, M. (2007). Phylogeny and cultural history in ontogeny. *Journal of Physiology*, 101, 236-246.
- Driscoll, M. P. & Burner, K. (2022). *Psychology of learning for instruction* (4th ed.). Boston: Pearson
- Gee, J.P. (2000) Identity as an Analytic Lens for Research in Education. *Review of Research in Education*, 25, 99-125
- Hutchins, E. L. (1995b). How a cockpit remembers its speed. *Cognitive Science*, 19, 265–288.
- Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, 38, 365-379
- Johnson, J. (1988). Mixing humans and nonhumans together: The sociology of a door-closer. *Social problems*, 35(3), 298-310. [AKA Bruno Latour]
- Kozulin, A. (2003). Psychological tools and mediated learning. In A. Kozulin, B. Gindis, V.S. Ageyev, & S.M. Miller (Eds.) *Vygotsky's educational theory in cultural context* (pp. 15-38). New York, NY: Cambridge University Press
- Latour, B. (1986). Visualization and cognition. *Knowledge and Society*, 6(6), 1-40.
- Lave, J. (1991). Situating learning in communities of practice. In L. Resnick, J. M. Levine, & S. D. Teasley (Eds.) *Perspectives on Socially Shared Cognition*, (pp. 63–82). Washington, D.C.: American Psychological Association.
- Marshall McLuhan, “The medium is the message.” In *Understanding Media: The Extensions of Man*, pp. 23–35, 63–7. New York: Signet, 1964.
- Moll, L. C., Amanti, C., Neff, D. & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory Into Practice*, XXXI(2), 132-141
- Nasir, N. I. S., & Cooks, J. (2009). Becoming a hurdler: How learning settings afford identities. *Anthropology & Education Quarterly*, 40(1), 41-61
- Nathan, M.J., & Alibali, M.W. (2010), Learning sciences. *WIREs Cognitive Science*, 1, 329-345. doi: 10.1002/wcs.54
- Philip, T. M., Bang, M. & Jackson, K. (2018). Articulating the “how,” the “for what,” the “for whom,” and the “with whom” in concert: A call to broaden the benchmarks of our scholarship. *Cognition and Instruction*, 36(2), 83-88.
- Rogoff, B. (2003). Orienting concepts. In *The cultural nature of human development* (Chapter 1, pp. 3-36). New York, NY: Oxford University Press
- Roschelle, J. (1992). Learning by Collaborating: Convergent Conceptual Change. *The Journal of the Learning Sciences*, 2(3), 235-276.
- Sawyer, R. K. (2006). Introduction: The new science of learning. In R. K. Sawyer (Ed.) *The Cambridge handbook of the learning sciences* (pp. 1-16). New York, NY: Cambridge University Press.
- Wortham, S. (2004). From good student to outcast: The emergence of a classroom identity. *Ethos*, 32(2), 164-187.

Design

- Ainsworth, S. (2006). DeFT: A conceptual framework for considering learning with multiple representations. *Learning and instruction, 16*(3), 183-198.
- Barab, S. & Squire K. (2004). Design-based research: Putting a stake in the ground. *The Journal of the Learning Sciences, 13*(1), 1-14.
- Barab, S., Dodge, T., Thomas, M. K., Jackson, C. & Tuzun, H. (2007). Our designs and the social agendas they carry. *The Journal of the Learning Sciences, 16*(2), 263-305.
- Barron, B. J., Schwartz, D. L., Vye, N. J., Moore, A., Petrosino, A., Zech, L., & Bransford, J. D. (1998). Doing with understanding: Lessons from research on problem-and project-based learning. *The Journal of the Learning Sciences, 7*(3-4), 271-311.
- Brown, A. L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The journal of the learning sciences, 2*(2), 141-178.
- Collins, A., & Halverson, R. (2010). The second educational revolution: Rethinking education in the age of technology. *Journal of Computer Assisted Learning, 26*(1), 18-27.
- Collins, A., Joseph, D., & Bielaczyc, K. (2004) Design Research: Theoretical and Methodological Issues. *The Journal of the Learning Sciences, 13*(1), 15-42.
- Driscoll, M. P. & Burner, K. (2022). *Psychology of learning for instruction* (4th ed.). Boston: Pearson
- Easterday, M. W., Aleven, V., Scheines, R. & Carver, S. M. (2017). Using Tutors to Improve Educational Games: A Cognitive Game for Policy Argument. *Journal of the Learning Sciences, 26*(2), 226-276
- Gee, J. P. (2008). Learning and games. The ecology of games: *Connecting Youth, Games, and Learning, 3*, 21-40.
- Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn?. *Educational psychology review, 16*(3), 235-266.
- Keller, J.M. (2016). Motivation, learning, and technology: Applying the ARCS-V motivation model. *Participatory Educational Research, 3*(3), 1-13.
- Lee, C. D. (2003). Toward a framework for culturally responsive design in multimedia computer environments: Cultural modeling as a case. *Mind, Culture, and Activity, 10*(1), 42-61
- Morrison, G. R., Ross, S. M., Morrison, J.R., & Kalman, H.K. (2019). *Designing effective instruction* (8th ed.). New York: John Wiley & Sons, Co.
- Narciss, S., Proske, A., & Koerndle, H. (2007). Promoting self-regulated learning in web-based learning environments. *Computers in Human Behavior, 23*(3), 1126-1144.
- Norman, D. A. (1993). *Things that make us smart: Defending human attributes in the age of the machine*. New York: Basic Books. [Chapter 3]
- Norman, D. A. (2013). The psychopathology of everyday things (Chapter 1) and Design thinking (Chapter 6). In *The design of everyday things*: Revised and expanded edition. Basic books.
- Papert, S. (1972). Teaching children to be mathematicians versus teaching about mathematics. *International Journal of Mathematical Education in Science and Technology, 3*(3), 249-262.
- Papert, S. (1980). *Mindstorms: Children, computers, and powerful ideas*. Basic Books, Inc.. [Chapters 1 & 6]
- Papert, S. (1996). Computers in the classroom: Agents of Change. *The Washington Post Education Review*, Sunday, October 27, 1996

- Pea, R. D. (1993). Practices of distributed intelligences and design for education. In G. Solomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 47-87). Cambridge, UK: Cambridge University Press
- Penuel, W. R., Fishman, B. J., Cheng, B. H., & Sabelli, N. (2011). Organizing research and development at the intersection of learning, implementation, and design. *Educational Researcher*, 40(7), 331-337.
- Puntambekar, S. & Hubscher, R. (2005). Tools for scaffolding students in a complex learning environment: What have we gained and what have we missed? *Educational Psychologist*, 40(1), 1-12.
- Reiser, B. J. (2004). Scaffolding complex learning: The mechanisms of structuring and problematizing student work. *The Journal of the Learning Sciences*, 13(3), 273-304
- Savery, J.R. (2005). Be VOCAL: Characteristics of successful online instructors. *Journal of Interactive Online Learning*. 4(2), 141-152.
- Takeuchi, L., & Stevens, R. (2011). *The new coviewing: Designing for learning through joint media engagement*. In New York, NY: The Joan Ganz Cooney Center at Sesame Workshop.
- Vai, M. & Sosulski, K. (2011). *Essentials of online course design: A standards-based guide*. New York: Routledge.
- Wood, D., Bruner, J.S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17, 89-100.