New Program Proposal
Doctor of Philosophy in Learning Sciences
Clemson University

Summary

Clemson University requests approval to offer a program leading to the Doctor of Philosophy in Learning Sciences to be implemented in January 2015. The proposed program is to be offered through traditional instruction. The following chart outlines the stages for approval of the proposal; the Advisory Committee on Academic Programs (ACAP) voted to recommend approval of the proposal. The full program proposal is attached.

Stages of Consideration	Date	Comments
Program Planning Summary received and posted for comment	2/11/14	
Program Planning Summary considered by ACAP through electronic review	3/30/14	One ACAP member noted that the research methods courses appear strong in this degree, but also suggested adding coursework in cognitive theory and design. Another ACAP member stated that the proposed program is similar to USC Columbia's Ph.D. program in Educational Psychology and Research.
Program Proposal Received	5/15/14	
ACAP Consideration	6/19/14	ACAP members suggested the proposal include statements about how the program differs from Educational Psychology programs. ACAP also recommended the addition of recruitment strategy statements to address USC Columbia's concerns about competition. ACAP requested a revised budget and budget justification.
Comments and suggestions from CHE staff sent to the institution	6/20/14	Staff requested additional information about potential employment opportunities and specificity about what students will be able to do and in which positions they might reasonably expect employment. Staff also requested a new letter of evaluation because the letter provided did not adequately address the proposed courses/curriculum, faculty, or resources required.
Revised Program Proposal Received	7/3/2014	

Stages of Consideration	Date	Comments
CAAL Consideration	8/7/2014	CAAL members discussed the need for the proposed program and how the program differs from a similar program offered by USC. CAAL members also discussed the cost of the program and the institutional representative explained how doctoral education is funded at Clemson.

Recommendation

      The Committee on Academic Affairs and Licensing recommends that the Commission approve the program leading to the Doctor of Philosophy in Learning Sciences to be implemented in January 2015.

CLEMSON UNIVERSITY

COLLEGE OF HEALTH, EDUCATION, AND HUMAN DEVELOPMENT
EUGENE T. MOORE SCHOOL OF EDUCATION

REQUESTING TO OFFER A NEW DEGREE PROGRAM

Doctor of Philosophy

In

Learning Sciences

Submitted to the South Carolina Commission on Higher Education
May 15, 2014

REVISED FOLLOWING ACAP
July 2, 2014

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Classification

Program Title	Learning Sciences
Concentrations/Cognates	
Academic Unit	School of Education
Designation Type	Doctor of Philosophy (Ph.D.)
Implementation Date	January 1, 2015
CIP Code	13.0607
Program	New
Site	Clemson University
Program qualifies for supplemental Palmetto Fellows Scholarship and LIFE Scholarship awards	NO
Delivery Mode	Traditional

Institutional Approval

Internal Institutional Approval	Date Approved
Clemson University Board of Trustees (preliminary approval)	2/7/2014
Teacher Education Curriculum Committee	2/26/2014
Teacher Education Faculty	3/7/2014
Health, Education, and Human Development Curriculum Committee	3/10/2014
Clemson University Graduate Curriculum Committee	5/9/2014
Provost	5/15/2014
President	5/15/2014

Purpose

The Eugene T. Moore School of Education is proposing a new interdisciplinary Ph.D. program in Learning Sciences. This program is designed for individuals who seek practical and theoretical training as research scientists, developers, practitioners in professional, non-profit, and academic settings.

Learning Sciences advances understanding of learning processes and the design of innovative learning environments. Students in the Learning Sciences program will learn to develop, deliver, revise, and evaluate effective learning experiences, and implement rigorous research studies in their chosen context.

Learning Sciences distinguishes itself from other fields by embracing a range of disciplines, believing an interdisciplinary approach offers solutions to understand, design, and implement change as learning is studied across a range of informal and formal real-world settings. The interdisciplinary and personalized nature of the program offers students opportunities to build a strong base of disciplinary knowledge augmented with discrete skills relevant to their area of specialization. Students benefit from multiple perspectives as they apply theoretical, research, and design work to specific topics in learning. For example, they may seek answers to questions regarding best strategies for ensuring that students excel in science, technology and math, or how to leverage digital media to create innovative environments for learning. Psychology, cognitive science, computer science, sociology, technological fields, and anthropology often contribute a context to Learning Sciences.

The goals of the Learning Sciences Ph.D. program are to prepare individuals who seek practical and theoretical training as research scientists, developers, and practitioners in professional, non-profit, and academic settings. Students within the Learning Sciences program may seek answers to questions regarding best strategies for ensuring that students excel in science, technology and math, or how to leverage digital media to create innovative environments for learning. Graduates pursue employment in digital media or game development, the military, higher education, school administration, curricula design or a host of industries, including Fortune 500 companies and educational toy designers seeking research specialists.

Although a degree in the Learning Sciences may result in its recipient choosing to work outside of academia, there is still a strong connection between the Learning Sciences and the fields out of which they grew. All of the Clemson faculty who will be a part of the Learning Sciences program have worked in or currently work with schools and teachers. All of the faculty members instruct Teacher Education students for preparation to teach PK-12. While a portion of our work is focused on learning outside of the classroom, we retain a strong connection to supporting the development of future teachers. Graduates may chose to work in school districts, to become professors preparing our next generation of educators, or to return to the PK-12 classroom. A Learning Sciences degree does not restrict possibilities; it creates new opportunities for exploring teaching and learning in all contexts.

This connection to schools is evident in our new mission statement in the Eugene T. Moore School of Education. We have increased our focus on rural education and are developing projects that support the entire state of South Carolina, not simply the Upstate region. Connecting with our programs in Educational Leadership and Curriculum and Instruction, the Learning Sciences program will provide opportunities to support rural schools through increased and thoughtful integration of new technologies as well as developing the capacities of school administrators to implement sound pedagogical methods using digital media.

In general, students in the Learning Sciences Ph.D. program will:
- ❖ Develop, deliver, evaluate, and revise effective learning experiences
- ❖ Design and implement rigorous research studies
- ❖ Analyze and disseminate high quality research
- ❖ Apply leadership skills in areas such as Academia, Business, Government, and Healthcare

Justification
A Doctor of Philosophy program in the Learning Sciences aligns with the institutional mission of Clemson University:

> *The mission of Clemson University is to fulfill the covenant between its founder and the people of South Carolina to establish a "high seminary of learning" through its historical land-grant responsibilities of teaching, research and extended public service.*

By initiating this new advanced degree program, we will be fulfilling the goals of the *Clemson 2020 Road Map* by providing students with "an exceptional educational experience grounded in engagement," focused on "innovation, through research and service that stimulates economic growth and solves problems" (Clemson University, 2011). This program can effectively serve the public good by focusing on emphasis areas that address some of the great challenges of the 21st

century. Teaching, research, and service within the program will contribute to Clemson becoming one of the nation's top-20 public universities.

The current high demand for graduates skilled in Learning Sciences skills is driven by ubiquitous technologies requiring a deep understanding of learning to improve existing technology-enabled learning environments and create new ones. In this regard, the School of Education is uniquely suited to offer such a program, with its newly constructed Digital Media, Gaming, and Learning Labs, and its emphasis on theories of learning that inform and motivate the development of new technologies, applications, and designed spaces. Graduates can pursue employment in a host of contexts including digital media or game development, the military, corporate training, industry, higher education, school administration, curricula design, or edutainment designers (e.g., educational toy makers, children's media creators, museum educators) seeking research specialists.

The primary opportunity for individuals with doctoral degrees in learning sciences may be faculty positions in higher education. The cognate area (18 credit hours) allows an individual to be prepared to meet the criteria for teaching in a discipline other than learning sciences. Employment growth following an advanced degree in Learning Sciences varies with the specialization pursued, with possibilities such as research, computer science application development, or entrepreneurship. In general, students pursuing STEM-related (science, technology, engineering, and mathematics) research who then decide to pursue higher education and careers in related fields are sought after and highly employable. According to the U.S. Bureau of Labor Statistics (U.S.BLS), computer science related fields have a predicted 30% growth from 2010-2020. The rate is well-above average with mean salaries of $90,000 reported in 2010. The U.S. BLS further reports projected employment growth in professional, scientific, and technical services at 29%, adding 2.1 million new jobs by 2020. Computer systems design and related services will grow by 47 percent and management, scientific, and technical consulting services are anticipated to grow by 58 percent. The Learning Sciences inform all of these careers. Learning Science-related industries contribute to an important growth sector in the national and global economy; having a program in South Carolina that offers a highly qualified work force and intellectual leadership will bring industry to our state.

Graduates with a Doctor of Philosophy degree in the Learning Sciences from Clemson University will be well positioned for the job market in a wide range of areas of employment. The interdisciplinary nature of the degree allows students to complete a program that is tailored to their interests and customized to meet their career goals. In addition, the integration of digital technologies into their coursework and research will provide students with ongoing, situated experience and deeply usable knowledge for the modern working world.

As a research degree, the PhD will give interested candidates the experiences and skills necessary to be a researcher in various environments. Although a career in the academy as a faculty member can be a common goal of a Learning Sciences degree, the requirements of the program do not confine students to a future in the professorate. Graduates can use their training in applied research areas more commonly found in business, health care, military, and government work. Curriculum development, learning technology, measurement and evaluation in schools, personnel training, and data analysis positions are potential jobs.

As an interdisciplinary program, the PhD will provide opportunities for students to enhance their foundational coursework in learning theory and research methods with contextualized foci in diverse areas of interest. Depending upon their individual specializations, graduates may go into careers as subject matter experts in specific academic fields. Clemson is exceptional in its

ability to give students opportunities in new fields such as digital media and learning, human-centered computing, digital rhetoric and communications, educational data mining, and learning analytics.

In addition to the potential paths already listed, graduates may pursue careers in an array of other areas: organizational/corporate learning and knowledge management, educational consulting, game and digital media development, data sciences, instructional software design, school administration, educational toy design, personnel training, measurement and evaluation, and public policy. With respect to the job opportunities available in each field, PhD graduates in the Learning Sciences will be positioned to work at mid-range and senior level positions upon completion of their degree work. Although it is difficult to target common tasks across all of these varied career opportunities, the common theme for the positions Learning Sciences graduates will hold is the focus on learning environments, digital media integration, and impact on the learner. Whether an LS graduate is working as a corporate trainer developing educational materials for a corporation, or a research scientist working with a design team creating educational toys, the tasks are connected by their focus on learning.

Currently, the state of South Carolina offers no Ph.D. programs in the Learning Sciences; the proposed program offers no duplication of existing programs. A Learning Sciences Ph.D. program in our state would allow South Carolina to compete with prestigious, highly ranked universities such as Stanford, Northwestern, Indiana University, Purdue, Vanderbilt, University of North Carolina, and Carnegie Mellon. These institutions successfully offer advanced degrees in the Learning Sciences to meet the market demand for academics and entrepreneurs capable of understanding, designing, and supporting productive learning and work environments across institutions and businesses. As there is no other program for the Learning Sciences in the state of South Carolina, the candidates matriculating through the program at Clemson will not negatively impact candidates at other institutions.

The University of South Carolina Columbia has a Ph.D. program in Educational Psychology and Research in their Department of Educational Studies. Although the design of the Clemson program has some similar foundational coursework to the Educational Psychology program at USC in areas such as learning theory and educational psychology, this could be said of most any program in the Learning Sciences. The distinction and value of the Clemson program comes from its interdisciplinary nature, its individualized approach to coursework, and its integration of learning technologies and digital media throughout coursework and research. An interesting aspect of the proposed Learning Sciences program at Clemson is its focus on cognate electives that provide students with a broad range of contexts for their learning. Although the program is housed in a School of Education, students are not required to situate their work in formal school environments. Each student will have a unique cognate experience, with courses selected from departments across campus that support their personal interests and goals. With opportunities ranging from architecture and design to human-centered computing to corporate training to media and communication, students can craft a program that builds on their foundational knowledge and extends into a variety of areas of expertise.

The differences between the Educational Psychology PhD at USC and the Learning Sciences PhD at Clemson are most evident in the differences in the universities. Simply put, they are different schools and thus offer different types of learning opportunities. Our proposal builds upon the particular programs and personnel available in other fields here at Clemson to support our cognates. PhD cognates in fields such as Architecture, Human-Centered Computing, Healthcare Genetics, and Rhetorics, Communication, and Information Design, would not be possible if Clemson did not have these programs. In addition, the new Eugene T. Moore School of

Education recently built our Digital Media & Learning Labs, which are created to support research and teaching in the Learning Sciences. Within the past two years, we have hired several new Assistant Professors whose work situates them in the Learning Sciences. Structurally, programmatically, and personnel-wise, Clemson provides an environment designed to support informal, interdisciplinary, forward-thinking academic work. At the same time, these differences between the two research universities in the state allow for opportunities for collaboration and research that might not be available independently.

We developed our Ph.D. program in the Learning Sciences with assistance from several sources, keeping our particular context of Clemson in the forefront of our decision-making. We used information from the International Society of the Learning Sciences as well as curriculum and programming from the following schools: Carnegie Mellon, Illinois – Chicago, Indiana, Northwestern, North Carolina, Pitt, Rutgers, Texas A&M, Utah State, Vanderbilt – Peabody, Virginia Tech, and Washington. To provide context, the following is an alphabetical listing of Graduate Programs that specialize in the Learning Sciences (Wikipedia, 2014):

- Carnegie Mellon University
- Columbia University, Teachers College
- Georgia Institute of Technology
- Indiana University
- McGill University
- National University of Ireland, Galway
- Ludwig Maximilian University of Munich
- Northwestern University
- Open University of the Netherlands
- New York University
- Pennsylvania State University
- Rutgers University
- Stanford University
- Tufts University
- University of California, Berkeley
- University of California, Los Angeles
- University of Colorado Boulder
- University of Illinois, Chicago
- University of Malaysia Sarawak, UNIMAS, Malaysia
- University of Memphis
- University of Michigan
- University of Minnesota
- University of Nottingham
- University of Pennsylvania
- University of Pittsburgh
- University of Sydney
- University of Utah
- University of Washington, Seattle
- University of Wisconsin, Madison
- Utah State University
- Vanderbilt University
- Virginia Tech

To further craft and differentiate the design and ethos of a program for Clemson, we looked at four of these programs in greater detail: Northwestern, Indiana, Utah State, and Virginia Tech. Northwestern University has the oldest program in the Learning Sciences in the United States and is often seen as the "gold standard" for such endeavors. Their program guided our initial conversations about coursework and research training. Indiana University provided an example of how digital media and other technologies can be deeply embedded into all facets of the program, rather than having technology in a separate and disconnected silo. Programs at Utah State and Virginia Tech were our guides as institutions similar to Clemson in scope and mission. Collectively, these programs were influential for how we approached the cognate structure as well as the foundational coursework and research experiences for students.

Admission Criteria

Admission to graduate study in Learning Sciences generally follow those of the Graduate School (see the Graduate school Announcements at http://www.registrar.clemson.edu/html/catalogGrad.htm). To receive admission to graduate study in Learning Sciences (LS), minimum requirements include at least a bachelor's degree, high quality previous academic record, and satisfactory scores on the general portion of the Graduate Record Exam (GRE) or other applicable test. Because of the interdisciplinary nature of the LS Ph.D., candidates will come from a wide range of backgrounds.

International students whose native language is not English are required to submit a satisfactory score on the Test of English as a Foreign Language (TOEFL) or to have completed approved English as a Second Language (ESL) course work from one of Clemson's ESL affiliates. Selected applicants will be invited for an interview. The interview takes place either on campus for local applicants or via phone conference for regional, national, or international applicants. After the interview, the admissions committee must recommend admission.

Enrollment

We anticipate annual enrollment for the planned program to average 16 students per year once the program is in its fourth cycle and the first cohort of students are in their graduating year. Program completion is designated for 3 ½ to 4 years with 4 to 6 graduates per year.

Table A: PROJECTED TOTAL ENROLLMENT						
YEAR	FALL		SPRING		SUMMER	
	Headcount	Credit Hours	Headcount	Credit Hours	Headcount	Credit Hours
2015–16	7*	63	7	63	0	0
2016–17	11	99	11	99	0	0
2017–18	15	135	15	135	0	0
2018–19	19	168	12**	126	0	0
2019–20	16	132	12**	108	0	0

      *4 new students and 3 switching from existing C&I Ph.D. **Anticipates students graduating

Curriculum

The Ph.D. curriculum in Learning Sciences will consist of a minimum of 60 hours of graduate credit: 4 courses in the learning sciences concentration ("Core Courses"), 4 courses in research methods, 6 cognate courses (can be from a combination of several content areas that in total create a rich context for practice and application), and 18 hour so dissertation. The choice of cognate courses must be approved by the student's Advisory Committee, and selected from courses numbered 8000 or above.

Doctor of Philosophy: minimum of 60 credit hours

- Research Courses: 12 credit hours (4 course)
- Core Courses: 12 credit hours (4 courses)
- Cognate Courses: 18 credit hours (6 courses)
- Dissertation: 18 credit hours

A course taken before admission that is equivalent to one of the curriculum course requirements, including those from an earned master's degree, may be exempted by demonstration of competency and/or providing evidence of equivalency to the student's Advisory Committee. The student must make his or her request in writing for each course, accompanied by an official transcript, catalog description, and syllabus or other supporting documentation. As many as 30 hours may be exempted toward the doctoral program. No more than 12 semester credit hours earned in a non-degree status at Clemson University can be applied to a degree program.

Research Courses: minimum 12 credit hours (4 courses)

- EDF 9790 Qualitative Research in Education
- EDF 9270 Quantitative Research Designs and Statistics for Educational Contexts
- EDF 9770 Multiple Regression/General Linear Model in Educational Research
- EDF 9780 Multivariate Statistics for Educational Research

Concentration: Core Courses: 12 credit hours (4 courses)

- (2) Doctoral Seminars:
  - EDF9010 Seminar in the Learning Sciences I - Fall, 3 credits
  - EDF9020 Seminar in the Learning Sciences II - Spring, 3 credits
- (2) Learning Theory courses:
  - EDLT 9070 Sociocultural Theories of Learning
  - ED 9550 Theoretical Bases of Instruction

Cognate Courses: minimum 18 credit hours (6 courses)

      The cognate courses are selected by the student and his or her doctoral committee to develop a context in which to embed learning sciences. The selection of the six or more cognate courses may be from more than one content area, as the aim is to give the student a rich background into the multidimensional nature of their focus context. Courses might be chosen from a variety of content areas: Architecture, Communication Studies, Computer Science, Digital Production Arts, Education, Family and Community Studies, Graphic Communications, Human-Centered Computing, Human Factors Psychology, Industrial Psychology, Sociology, Anthropology, History, and Rhetoric, Communication, and Information Design.

The following departments at Clemson University have expressed a specific interest in collaborating with the Learning Sciences Ph.D. program to provide cognate coursework: Psychology, Sociology and Anthropology, The School of Computing, Human Centered Computing, Graphic Communications, English, Education, History, and Family and Community Studies. The program has been endorsed by Dr. Vernon Burton, Director of the Clemson Cyber Institute.

Sample Cognate Courses:
- Communication Studies
  - COMM 8000 Communication Pedagogy I
  - COMM 8010 Communication Theory I
  - COMM 8020 Communication Theory II
  - COMM 8030 Survey of Communication Technology Studies
  - COMM 8050 Communication and Social Movements
  - COMM 8080 Representation and Popular Culture
  - COMM 8090 Communication, Culture, and the Social Net
- Education
  - ED 9220 Design, Aesthetics, and Learning: Perspectives and Applications in Education
  - EDF 9050 - Critical Look at Social Media, Games and Emerging Technologies
  - EDF 9110 - Games for Learning
  - EDF 9120 Research and Development of Games for Learning
  - EDF 9130 Instructional Design and Digital Media
  - EDF 9140 Learning Analytics
  - EDF 9150 Learning Environments
  - EDF 9700 Identity, Schooling, and Democratic Education
  - EDF 9760 History of American Education
  - EDF 9800 Internship in Curriculum & Instruction
  - EDF 9940 Directed Research
- Human-Centered Computing
  - HCC 8310 Fundamentals of Human-Centered Computing
  - HCC 8810 Selected Topics
  - HCC 8880 Directed Projects
  - HCC 9500 Selected Topics

NEW COURSES needed for the Ph.D. in Learning Sciences
There will be 2 new courses, EDF 9010 and EDF 9020:

EDF 9010: Seminar in Learning Sciences I
This is the first of a two semester course sequence. In these seminars, we investigate foundational concepts in the Learning Sciences, such as learning, instruction, assessment, and environment. Readings, assignments, and discussions focus on historical perspectives, major scholars, foundational ideas, research methods, and intellectual debates that have defined, challenged, and changed the Learning Sciences. In addition, we work with issues important for students' enculturation into doctoral studies and the field of Learning Sciences.

      Foundations of the Learning Sciences
            An Interdisciplinary Science of Learning - 9 hours
            Theories of Learning - 9 hours
            Nature of Knowledge - 6 hours
            Design-based Research - 3 hours

        Inquiry-based Instruction - 3 hours
        Learner-Centered Design - 3 hours
    Individual Area of Interest
        Professional Standards and Practices - 3 hours
        Conceptual Framing - 3 hours
    Enculturation to Doctoral Studies
        Institutional Responsibilities - 3 hours
        Programmatic Responsibilities - 3 hour

EDF 9020: Seminar in Learning Sciences II

This is the second of a two course sequence. In these seminars, we investigate foundational concepts in the Learning Sciences. Readings, assignments, and discussions focus on historical perspectives, major scholars, foundational ideas, research methods, and intellectual debates that have defined, challenged, and changed the Learning Sciences. Prerequisite: EDF 9010
    Foundations of the Learning Sciences
        Learning Artifacts - 12 hours
        Project-Based Learning - 6 hours
        Models, Systems, and Pattern Recognition - 6 hours
        Collaborative Learning - 3 hours
        Learning Environments - 6 hours
    Individual Area of Interest
        Designing a Research Agenda - 3 hours
        Developing Guiding Questions - 3 hours
    Enculturation to Doctoral Studies
        Disciplinary Enculturation - 3 hours
        Academic Community - 3 hours

Curriculum Map:
First Year
Fall
    Core Course: EDF 9010 Seminar in the Learning Sciences I
    Core Course: EDLT 9070 Sociocultural Theories of Learning
    Research Course: EDF 9270 Quantitative Research Designs and Statistics for
        Educational Contexts
Spring
    Core Course: EDF 9020 Seminar in the Learning Sciences II
    Core Course: EDF 9550 Theoretical Bases of Instruction
    Research Course: EDF 9770 Experimental and Non-experimental Research Methods in
        Education II
Second Year
Fall
    Cognate Course
    Cognate Course
    Research Course: EDF 9790 Qualitative Research in Education
Spring
    Cognate Course
    Cognate Course
    Research Course: EDF 9780 Multivariate Statistics for Educational Research
Third Year
Fall
    Cognate Course

6 hrs dissertation
Spring
Cognate Course
6 hrs dissertation
Fourth Year
Fall
6 hrs of dissertation

Assessment
Benchmarks:
Each student in the Learning Sciences program will participate in an annual review. The purpose of this task is to review the student's progress in the program and provide feedback. The review will include evaluation of the following benchmarks:

1. Preliminary Literature Review (documented in the first year).
2. Professional Competence (documented by student for committee). These competencies will be fulfilled before the student is awarded the doctoral degree.
   a. Students will teach a college/university undergraduate class and/or demonstrate competency in instructional methods as they relate to higher education.
   b. Students will conduct a national presentation as a primary presenter and/or demonstrate competency in scholarly communication within a professional setting.
   c. Students will submit a manuscript for publication (national level preferred) as a primary author and/or demonstrate competency in scholarly writing in an external resource.
3. Comprehensive Examination
   The comprehensive examination consists of two stages – written then and oral. The written comprehensive examination consists of two possible formats which may be combined: a traditional written exam or a portfolio. The oral stage is an oral defense of the written responses.
4. Dissertation Proposal includes a written proposal and an oral defense.
5. Dissertation Defense includes a written dissertation and an oral defense.

Each year the Learning Sciences Advisory committee will study the compilation of the benchmark data for all students in the program to determine program strengths and weaknesses, and suggest improvements. Program success will be measured by student enrollment, percent reaching the benchmarks each year, graduation rates, and successful employment after graduation. Students and their employers will be surveyed one and three years post-graduation.

Faculty

Table B: Faculty List	Highest Degree Earned	Field of Study	Teaching in Field (Yes/No)
Professor #1	Ph.D.	Adolescent Development, Quantitative Research Methods	yes
Professor #2	Ph.D.	Learning, Motivation, Cognition, Psychometrics	yes
Assistant Professor #1	Ph.D.	Digital Media, Gaming	yes
Assistant Professor #2	Ph.D.	Digital Media, Educational Psychology, Design-Based Research	yes
Assistant Professor #3	Ph.D.	Educational Psychology, Mixed Methods Research Methods	yes
Assistant Professor #4	Ph.D.	Educ. Psychology, Creativity & Imagination, Quantitative Research Methods	yes
Assistant Professor #5	Ph.D.	Learning Sciences, Classroom Discourse	yes
Assistant Professor #6	Ph.D.	Arts & Creativity, Design-Based Research	yes
Assistant Professor #7	Ph.D.	Child Development	yes
Assistant Professor #8	Ph.D.	Sustainability Education, Project Based Learning	yes
Assistant Professor #9	Ph.D.	Advanced Quantitative Research Method	yes
Lecturer #1	Ph.D.	Learning Sciences, Educational Psychology	yes

Resources

Table C: UNIT ADMINISTRATION, FACULTY, AND STAFF SUPPORT						
YEAR	**NEW**		**EXISTING**		**TOTAL**	
	Headcount	**FTE**	**Headcount**	**FTE**	**Headcount**	**FTE**
Administration						
2015 – 16	0	0	2	0.2	2	0.2
2016 – 17	0	0	2	0.2	2	0.2
2017 – 18	0	0	2	0.2	2	0.2
2018 – 19	0	0	2	0.2	2	0.2
2019 – 20	0	0	2	0.2	2	0.2
Faculty						
2015-16	0	0	11	2.5	11	2.5
2016 – 17	0	0	11	3.5	11	3.5
2017 – 18	0	0	11	3.5	11	3.5
2018 – 19	0	0	11	4.25	11	4.25
2019 – 20	0	0	11	4.25	11	4.25
Staff						
2015 – 16	0	0	1	0.1	1	0.1
2016 – 17	0	0	1	0.1	1	0.1
2017 – 18	0	0	1	0.1	1	0.1
2018 – 19	0	0	1	0.1	1	0.1
2019 – 20	0	0	1	0.1	1	0.1

Physical Plant

The School of Education has recently opened new Digital Media, (DML) labs within the *Eugene T. Moore School of Education.* The DML labs were conceived to address the need to move research from labs to practice. The labs consist of four inter-related spaces including collaborative writing, video, audio production, and game design. Along with a customizable large-space, the breakout rooms allow collaboration with app and game development, facilitate meetings, workshops, and physical/construction activities. A separate game play lab offers opportunities to consider learning opportunities in immersive 3-D game environments. The labs are open to student groups across campus, pre-service and in-service teachers, faculty, and young learners in summer camps. The DML labs will be a useful site for engaging with a wide community of researchers, and will serve as a site for broad impact activities involving the larger public. The labs are funded through existing School of Education funds and nominal, customary student fees contribute to their maintenance.

Equipment

There are no additional major equipment items needed to support the proposed Learning Sciences Ph.D. degree. The DML Labs allow access to a robust technology infrastructure, audio and video production equipment, game design and game making equipment, a 3-D printer, dozens of commercial off-the-shelf games, 4 LCD monitors for presentation and

videoconferencing, 10 iPads, 20 iPod touches, 20 Nexus Tablets, as well as ample conference and meeting spaces. Additionally, students bring their own devices and access the Internet via campus-supported Wi-Fi in all Schools across the University.

Library Resources

The proposed Learning Sciences Ph.D. degree integrates existing units/courses across campus to form a unique degree program. Cooper Library on Clemson University's campus o f f e r s resources required for the proposed LS Ph.D. The library offers a host of digital access to Learning Science journals including: Journal of the Learning Sciences; International Journal of Computer Supported Collaborative Learning; Cognition and Instruction; Mind, Culture and Activity; Games and Culture; Technology, Pedagogy and Education; Educational Psychology; and Instructional Science. As services and resources are already in place, along with a process to request additional resources (i.e. journals) there is no need for additional library resources.

Accreditation, Approval, Licensure, or Certification

The proposed Learning Sciences Ph.D. is not subject to specialized or professional accreditation or approval by any state agency other than the Commission.

Articulation

A course taken before admission at another institution that is equivalent to one of the curriculum course requirements, including those from an earned master's degree, may be exempted by demonstration of competency and/or providing evidence of equivalency to the student's Advisory Committee. The student must make his or her request in writing for each course, accompanied by an official transcript, catalog description, and syllabus or other supporting documentation. As many as 30 hours may be exempted toward the doctoral program. No more than 12 semester credit hours earned in a non-degree status at Clemson University can be applied to a degree program.

Estimated Costs and Sources of Financing

Table D: ESTIMATED COSTS BY YEAR						
CATEGORY	1st	2nd	3rd	4th	5th	TOTALS
Program Administration	$20,500	$20,500	$20,500	$20,500	$20,500	$102,500
Faculty Salaries	$190,000	$260,000	$260,000	$297,500	$297,500	$1,305,000
Graduate Assistants	$142,282	$144,144	$146,090	$148,148	$150,305	$730,969
Clerical/Support Personnel	$3400	$3400	$3400	$3400	$3400	$17,000
Supplies and Materials	$200	$200	$200	$200	$200	$1000
Library Resources						
Equipment	$2600	$2600	$2600	$2600	$2600	$13,000
Facilities						
Other: travel	$5500	$7500	$7500	$8500	$8500	$37,500
Other: recruitment/ seminars	$2000	$2000	$2000	$2000	$2000	$10,000
TOTALS	$366,482	$440,344	$442,290	$482,848	$485,005	$2,216,969
SOURCES OF FINANCING BY YEAR						
Tuition Funding	$14,574	$32,334	$50,094	$63,414	$63,414	$223,830
Program-Specific Fees	0	0	0	0	0	0
State Funding*	0	0	0	0	0	0
Reallocation of Existing Funds**	$336,908	$393,010	$377,196	$404,434	$406,591	$1,918,139
Federal Funding	0	0	0	0	0	0
Other Funding (Specify)	$15,000	$15,000	$15,000	$15,000	$15,000	$75,000
TOTALS	$366,482	$440,344	$442,290	$482,848	$485,005	$2,216,969

**Faculty salaries reallocated from existing funds. Faculty currently teaching in the Curriculum and Instruction program are being reassigned to this program as the C&I program is redesigned. Part of the reallocation of funds includes reallocation of current graduate assistants funding to this program; it should be noted that graduate assistants often teaching undergraduate courses, mentored by senior faculty. Additionally, the any surplus revenue generated from the Special Education MAT will help to cover costs of this program. The funding listed under "other funding" includes revenue generated through the Center of Excellence in Digital Media and Learning, which regularly conducts professional developments. In addition, other funding will include annual conferences in Games and Learning. These are extremely conservative estimates. Finally, the cost for graduate assistants is a worst case scenario calculated with no external funds generated in the program. This is very unlikely as the type of research conducted in the Learning Sciences and the expectations of the faculty within this program is to successfully secure external funding that includes funding graduate research assistants.

External Evaluations

Evaluator #1
Dr. Reed Stevens is a Professor of Learning Sciences in the School of Education and Social Policy (SESP) at Northwestern University, in Evanston, Illinois. Nationally, SESP consistently ranks among one of the top graduate schools according to U.S. News and World Reports. Dr. Stevens, an expert in cognition and learning, is especially well suited for guidance as an external reviewer. He received a Ph.D. from the University of California, Berkley in Cognition and Development. His vast experience in writing grants, research, course development, and teaching in interdisciplinary Learning Science programs spans two decades. He has developed and taught graduate courses in Cognition in Context, Design-based Research, Technology in Context, Interaction Analysis, Discourse in the Disciplines, and Foundations of Learning Sciences. Beyond continuing to build an internationally recognized Learning Science Program at Northwestern, he has secured millions of dollars in National Science Foundation, Gates Foundation and other private funding to research cognition and learning and published more than 50 articles related to his research. Most notably are his recent efforts through the creation of FUSE labs providing and studying interest-driven learning experiences for Chicago area youth. His research interests involve learning and activity in a wide range of places and situations, and the design of learning tools including curriculum, activities and technologies. Dr. Stevens works closely with numerous experts in the field and is well known for his efforts organizing and presenting at conferences, workshops, and symposia related to the Learning Sciences. Dr. Stevens was awarded the Young Scholar and Jan Hawkins Early Career Awards recognizing his contributions to the field.

Evaluator #2
Dr. Ilana Horn is an Associate Professor in the Department of Teaching and Learning in the Peabody College of Education and Human Development at Vanderbilt University. Her research centers on ambitious and equitable teaching, and her work spans researching and assessing interdisciplinary learning in both formal and informal settings. Dr. Horn received her PhD from the University of California, Berkley, where she received the Graduate School of Education Outstanding Dissertation Award. She became an AERA-IES Postdoctoral researcher at Stanford University's School of Education, researching within a cross-area specialization, highly ranked Learning Sciences program. She then joined the faculty in one of the most prestigious Learning Sciences programs - recently ranked 7th by US World Reports, at the University of Washington, Seattle.

Dr. Horn has published more than 25 research articles and book chapters including numerous articles in *Cognition and Instruction*, *The Journal of Learning Sciences*, and *Mind, Culture and Activity.* She has served as a reviewer for 15 journals, five of them focused specifically on Learning Science research. Additionally, she has secured more than 6.5 million dollars in funding during her career to support teaching, learning, and assessment in educational environments. She is well known and well respected by her peers in the Learning Sciences for her efforts in mathematics education, learning, and cognition.

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NORTHWESTERN
UNIVERSITY

To Whom It May Concern:

I am writing to share my perspective on the proposed Learning Science PhD program at Clemson University. I am Professor in Northwestern's Learning Sciences program. Ours was the first PhD in the Learning Sciences and is typically considered among the best, if not the best program, in the world. Prior to joining Northwestern, I founded a Learning Sciences program at the University of Washington, co-lead a ten year, NSF Science of Learning Center, co-chaired the International Conference for the Learning Sciences, and served as an Associate Editor for the Journal of the Learning Sciences. This career history makes me well suited to evaluate the proposed program.

I find that the proposed program is thoughtfully organized and very much in keeping with many of the programs appearing each year, both in the US and internationally. The foundational courses are solid and the elective coursework appears to give PhD student a number of possible directions for developing specialization, including in areas that are in increasingly high demand like game-based learning environments.

One line of argument the proposal takes is to distinguish the Learning Sciences from Educational Psychology. The proposal is correct in making this distinction while also noting some common concerns (like a focus of theories of learning and cognition); Learning Sciences is interdisciplinary, more concerned with creating new learning tools and environments, and the Learning Sciences take a much more varied collection of settings as sites for research and design, spanning both schools and non-school learning environments. The Learning Sciences is a growing 'brand', as evidenced by the list of national and international programs listed in the proposal. The number of universities on that list has probably tripled in the last ten years. Once we created the Learning Sciences program at the University of Washington, it became clear that PhD applicants to our Educational Psychology program (of which I was also a faculty member) and our Learning Sciences program were different sorts of people. And in just a couple years, the Learning Sciences program was receiving *much* stronger applicants (in terms of academic record) than was the Educational Psychology program.

There are few Learning Sciences programs in the southeastern part of the US, so I think a program at Clemson could be an immediate regional draw and put graduate students and faculty there into a growing network in a growing field. That was certainly what happened at the University of Washington, a program that has since grown to have an international reputation. I see in the Clemson proposal a well-organized program of study and a clear awareness of the contemporary issues of the Learning Sciences field. I endorse the creation of this program.

Sincerely,

Reed Stevens
Professor, Learning Sciences
Northwestern University

Department of
Teaching and Learning

VANDERBILT Peabody College

July 1, 2014

To Whom It May Concern:

I have had an opportunity to review the materials proposing a Learning Science PhD Program at Clemson University. I come to this evaluation as an active member of the Learning Sciences community. I have worked at three universities with active Learning Science programs — Stanford, University of Washington, and Vanderbilt University — so I have seen a variety of configurations and how they support students' intellectual development and employment prospects.

Although the proposal writers made this point, I want to emphasize an important analytic shift that the Learning Sciences, as a field, makes to set it apart from more traditional Educational Psychology programs. The world is changing rapidly, and, through technology, people have more resources to draw on for their own learning. However, not all of these changes are positive, and we, as educators, need robust theories to understand how to better design and evaluate the new learning environments that continue to emerge. Traditional learning theory sought primarily to capture what happens in schools and classrooms with children and, with these origins, does not support a deep understanding of informal learning over the course of a lifetime in dynamic environments.

When I reviewed the proposed program, I felt that, for the most part, the focal course sequence and stated goals stood to contribute to the new ideas about learning represented by the Learning Sciences. The two core seminars, *EDF 9010: Seminar in Learning Sciences I* and *EDF 9020: Seminar in Learning Sciences II,* were well conceptualized. However, because of the goal of Learning Sciences to capture the dynamic and messy learning of everyday life, I would have liked to see explicit attention to informal learning in one of these seminars. Similarly, since an important goal of the field is relating learning designs to learning outcomes, I would like assurance that this is an explicit goal of the two segments on *Design-based Research* and *Learner-Centered Design* in EDF 9010.

Other than these details, it seems to me that the overall plan for the program and its implementation is well thought out. I was especially heartened to see that the Clemson faculty have connected to the International Society for Learning Sciences, which provides resources for new Learning Science programs through its Network for Academic Programs in Learning Sciences (http://isls-naples.psy.lmu.de/objectives/index.html), which includes professional development and sample course syllabi. I hope that the faculty plan to actively make use of this network, both for support and hiring. I also find it promising that the faculty who will make up the core of the Learning Sciences program at Clemson are a diverse, collaborative group with strong ties to the Learning Sciences community. With its new Digital Media & Learning Labs, the Eugene T. Moore School of Education has the facilities and resources to support innovative research and teaching.

Department of
Teaching and Learning　　　**VANDERBILT** ▼ Peabody College

The Learning Sciences stands to make important contributions to our understanding of our modern world. In light of the *Clemson 2020 Road Map's* goal to provide students with "an exceptional educational experience grounded in engagement," focused on "innovation, through research and service that stimulates economic growth and solves problems," this program seems to fit in with your institution's broader strategy. Additionally, your faculty has put together a good course of study that should be competitive regionally and nationally for strong students interested in these issues of human and social development.

Overall, I evaluate this as a strong proposal for an important program in your institution.

Sincerely,

Ilana Seidel Horn
Associate Professor of Mathematics Education