

Excellence in Undergraduate Education (EUE) Proposal

Project ID# (leave blank)

25-02

Project Title

Improving a human osteological collection to increase high-impact practices in teaching

Project Director	ID Number	Telephone	Email
Corey Ragsdale, PhD	800618766	650-2933	cragda@siue.edu

Department	Campus Box	School College
Anthropology	1451	College of Arts and Sciences

Course or Program

Anthropology Major/Minor, Forensic Science Minor, Forensic Science Master's

Project Co-Director	ID	Department	Email

Student Impact: 260

Priority Rating (If Submitting Multiple Proposals):

Project Budget

Salary	Wages	Travel	Equip.	Comm	CServ	Auto	Tele	Awards	Total
	\$2,240		\$9,813						\$12,053

Cost-Sharing

Salary	Wages	Travel	Equip.	Comm	CServ	Auto	Tele	Awards	Total
			\$1,963						\$1,963

Prior EUE Support

Project Director	Project Number	Award Amount	Project Dates

Applicable 2024-2025 Priorities (check which priority your proposal fits, if any):

- Course redesign project that uses inclusive, student-centered pedagogies to address equity gaps, improve student learning outcomes, & enhance retention
- Project involves courses that have high number of sections, a high ratio of D/F/W grades, or those key required courses with high enrollments and opportunities to improve equitable student success.

Improving a human osteological collection to increase high-impact practices in teaching

Project Summary

Current trends in high-impact practices involve, in part, preparation for real-world problems and engaging students in active learning. For the Anthropology Department, these objectives are achieved through high-quality educational experience in laboratory courses and courses that include student analytical exercises. In today's world, many of these courses serve students interested in fields within anthropology, museum studies, forensic science, and health- and sports medicine-related careers. These courses serve hundreds of students each year. Recent research regarding effective instruction in courses designed for these students have found that realistic examples and variation in materials using hands-on models are key to success. In recent years, these learning objectives have been met, to some extent, with the aid of a historic human skeletal collection on loan from the Illinois State Museum. In January 2020, the Anthropology Department received notice that all of these materials needed to be returned, likely resulting from updated provenience information and changes in federal policy regarding potential prehistoric human remains. Although the return of these materials is consistent with ethical standards, and is in accordance with federal law regarding the Native American Graves Protection and Repatriation Act (NAGPRA), it also had a significant negative impact on the quality of instruction for several courses, some of which are necessary for graduation. The COVID-19 pandemic that followed the return of the collection provided some relief for the lack of materials necessary to deliver high quality, hands-on instruction. Since fully in-person classes have resumed, the issue of adequate materials has returned, especially with the relevant courses filling to capacity during the 23-24 academic year. Additionally, the development of the new Forensic Science Master's degree will add the participation of graduate students.

The proposed project will not only maintain current high-quality standards for students at Southern Illinois University Edwardsville (SIUE), but will enhance high-impact practices by allowing students access to exceptional materials in the laboratory setting. The objective of this project is to obtain and employ a collection of human skeletal models produced through Bone Clones Inc. These materials are high-resolution models based on specimens held at the University of New Mexico Maxwell Museum of Anthropology and the San Diego Museum of Man, among others. The proposed materials include examples of real human variation (accompanied by full osteological reports), trauma (fractures) and pathology, and other anatomical features such as musculature. The addition of developing individuals, referred to as juveniles or subadults, will also allow for experiential learning related to growth and development. Finally, these high-quality reproductions will contribute to accessibility for students that may be uncomfortable, for cultural or ideological reasons, handling real human remains. The materials produced by Bone Clones are an excellent proxy for real human bones, but are more resistant to damage through handling. Additionally, the proposed project will allow funding for an undergraduate research assistant to produce virtual models of the purchased materials, increasing access and availability to students and faculty alike. The scanning will be completed in a secure and established space with previously purchased equipment.

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Current situation

The Department of Anthropology at Southern Illinois University Edwardsville (SIUE) has an excellent reputation for delivering high quality, hands-on instruction. Key to the success of experiential learning outcomes consistent with the vision of SIUE, and Anthropology, are the teaching and research laboratories along with the materials therein. The proposed project seeks to improve these experiential learning opportunities. Since the dissolution of the Anthropology department at Southern Illinois University Carbondale, SIUE has become the only Anthropology department in Southern Illinois, and as such, the primary producer of students entering into the various fields within the various professional, academic, and government markets.

The human skeletal collection in Anthropology at SIUE being used for instruction consists of plastic, Bone Clones, and real human remains. The plastic skeletons (10) are low-quality generic molds that do not exhibit trauma (such as fractures and healed fractures), pathology (evidence of health or stress on the bone), attachments for muscle or other soft tissue, or any measurable or observable elements of human variation. As such, the plastic skeletal materials are useful only in the introductory sense, and many are interred at a site used every two years for a field-based course (Biological Anthropology Field School). The measures described above, however, are increasingly important variables in anthropology, forensic science, and various health-related professions. The ability to demonstrate human variation, as well as provide students the opportunity for hands-on, experiential learning in health/lifestyle and violence is currently limited. Teaching the aforementioned aspects of human osteology was previously achieved with the help of a real human skeletal collection on loan from the Illinois State Museum (ISM). These remains, containing historic and probable prehistoric components, have transferred between the ISM and SIUE a number of times since 1994 (ISM collection number 2003.051). On

January 29, 2020, the ISM sent a formal request for the permanent return of the collection in accordance with changes in federal protocols. The return of these materials on March 30, 2020 fulfilled the ethical and legal obligations of both the Department of Anthropology and the ISM, but has had a significant negative impact on the experiential learning potential of a large number of students per year. A previously awarded Excellence in Undergraduate Education (EUE) grant in 2020 was proposed to aid in this transition, but unfortunate budget circumstances led to an unfunded award at that time.

The Anthropology department maintains real human remains housed in a secure lab/storage space, the Forensic Anthropology and Bioarchaeology Lab (FABL). This collection includes only four real human skeletons. Of the four human skeletons, two are incomplete, and two are excellent specimens recently purchased (Summer 2023) with funds provided to support the newly established Forensic Science Master's degree. With the addition of graduate students in the 400-level courses in Anthropology, these two skeletons will be useful for study materials, with the anticipation that undergraduate students will be handling (primarily) materials acquired through Bone Clones. The proposed project seeks funding to develop/improve a skeletal collection suitable for both undergraduate and graduate student training in several courses, using anatomically accurate models that exhibit trauma, pathology, musculature, and elements of human variation. These materials will not only replace those lost in the return to the ISM, but additionally enhance the breadth of the collection and target specific learning objectives for a number of courses, provided in the table below. Finally, this project will allow a funded undergraduate student to gain laboratory experience in the FABL by producing 3d models of some of the specimens purchased, as well as those purchased prior (Summer 2023).

Course	Course Title	Frequency	Cap	Applications
ANTH 360B	Biological Anthropology Lab	Fall	20	ANTH major/minor, BLS & EH
ANTH 369	Intro to Forensic Anthropology (4 sections)	Spring/Summer/Winter	35-50	ANTH major/minor, ForSci minor, BLS & EH. SIUC exchange.
ANTH 366	Human Variation	Spring (alternating)	20	ANTH major/minor, ForSci minor, BLS & EH
ANTH 368	Archaeology of Death	Spring (alternating)	20	ANTH major/minor, ForSci minor, BLS & EH
ANTH 467	Dental Anthropology	Spring (alternating)	20	ANTH major/minor, ForSci minor & MS, BLS & EH
ANTH 468	Osteopathology	Spring (alternating)	20	ANTH major/minor, ForSci minor & MS, BLS & EH
ANTH 469	Forensic Anthropology Applications	Every Fall	20	ANTH major/minor, ForSci minor & MS, BLS & EH
ANTH 474	Biological Anthropology Field School	Summer (alternating)	15	ANTH major/minor, ForSci minor & MS, BLS & EH

Table 1. Relevant courses in need of the materials proposed in this project.

Proposed project

The proposed project will be focused on the development of materials necessary to improve hands-on learning in increasingly high demand courses at undergraduate and graduate levels. The materials acquired through EUE funds would enhance high-impact practices by improving the experiential learning component of courses across departments, and provide a more realistic (real-world) experience for students projected in multiple career paths (forensic, medical, and anthropological). High-impact practices in education are particularly important when reaching a diverse group of students, including those that are first generation or non-traditional. Anthropology courses with a laboratory component are essential in reaching these goals, and this project seeks to improve laboratory and distance learning/digital education.

Laboratory course materials

One aim of this project is to obtain anatomically accurate model human skeletons to be used in courses necessary to the Anthropology major and minor, the Forensic Sciences minor, and the new Forensic Science Master's degree. As indicated in Table 1, these courses also serve general education needs, fulfilling requirements in Breadth Life Sciences (BLS), Breadth Social

Sciences (BSS), Experience Laboratory (EL), and Experience Health (EH). The skeletal materials to be acquired are produced by Bone Clones Inc., a company that has a stellar reputation of producing high- quality replicas of actual cases (original specimens) housed in various museums. The collection proposed here will allow SIUE students to gain an excellent laboratory educational experience that is competitive with high-ranking universities around the United States, while maintaining firm ethical procedures. A hands-on, laboratory environment is ideal for understanding trauma, health, and human variation in human remains. All of these courses consistently meet enrollment caps, and lead to a high degree of retention and graduation. Departments involved in Forensic Sciences, including Anthropology, are developing strategies that will allow SIUE to provide educational opportunities for law enforcement agencies and the broader community. These opportunities may range from short courses (such as Summer and Winter), to other participatory opportunities in courses related to investigative and laboratory procedures. The need for a diverse skeletal collection such as that proposed here will be critical for success of this initiative.

Digital skeletal repository

Another aim for this project involves the creation of a digital repository of three-dimensional (3d) models of the collection. This portion of the project is designed primarily to improve high-impact practices in larger courses for which a laboratory component is not practical. The COVID-19 pandemic made apparent the need for online, virtual materials for hands-on and laboratory experiential learning. However, the need for accessible virtual materials goes beyond completely online courses. A consistent limitation to these courses regarding learning objectives, identified in student evaluations, is the desire for a more hands-on component and limited time to study with the materials. With the advances in digital modelling

of human skeletal materials, it is now possible to produce a measurable representation of bones that can serve as research and educational resources. The 3d images are produced in relatively small files, and can be accessed through free downloadable software. For this project, the lab materials to be purchased will be 3d scanned, and placed into a drive that will serve as a digital repository. The drive will be accessible to courses at all levels, allowing students the opportunity to gain experience with the materials from home, as well as in the classroom. 3d scanning will be achieved with the help of an undergraduate research assistant in the Anthropology Laboratory. The undergraduate research assistant will be familiar with the 3d scanner, and human skeletal anatomy. A digital skeletal repository used as a resource in undergraduate experiential learning is both innovative and rare, and will provide a unique experience for SIUE students.

The course that will benefit the most from the proposed project is ANTH 369: Introduction to Forensic Anthropology. This course is offered in-person every Spring, and online sections are also offered during the Summer and Winter sessions. Both in-person and online sections can be greatly enhanced by the virtual specimens, and the in-person section, as well as other courses (Table 1). These sections range in enrollment between 35 to 50, and enrollment for all sections have filled and waitlisted since Fall 2016. Poor performance and DFW rates in this course have long been tied closely to lack of hands-on learning, specifically insufficient time with materials that provide examples, even prior to development of online sections. Student feedback has reinforced this need for materials.

Evaluation and Dissemination

The quality and impact of the proposed project will be evaluated through student surveys, and with data analysis of success rates in the affected courses. The student surveys to be administered in addition to the standardized student evaluations (SETs) will focus on the utility

of the materials used in courses with a laboratory component, and the utility of the digital repository in the large lecture courses. In the case of lab courses, the evaluation will focus on student reporting data regarding their success in the course, as well as real-world experience in the course through the use of the Bone Clones Inc. materials. In the case of the larger courses, such as ANTH 369: Introduction to Forensic Anthropology, the evaluation will focus on the usefulness and accessibility of the online digital resources in the overall success of the course and the applicability to potential career paths in Forensic Sciences. Additional evaluation will compare success and student feedback between online and in-person formats of the course, in order to examine and assess the potential for digital, online learning. Data from previous student SET scores and comments will be compared to those from the courses offered with the new materials in order to identify improvement in learning outcomes. Student success data will also be analyzed to evaluate the usefulness of the materials in traditional lab vs. online settings. The courses offered during the 2024-2025 academic year for which the materials will apply have been offered in prior semesters, including those during the COVID-19 pandemic. Student success rates and attendance will be compared among the lab and lecture courses prior to and after the acquisition of the materials. These indirect measures will be used to analyze the direct effects of the new materials and digital resources on overall student success.

Finally, the need of these materials was initially demonstrated for a similar application for the EUE application period in 2020. Unfortunately, although awarded, budget changes at the time did not allow for funding of the award. The need for these materials has increased since this time, as both sections and seats for course like ANTH 369 have increased. With students more accustomed to both laboratory and virtual resources, this proposal is timely as it is necessary for the overall success of our students here at SIUE.

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Budget Justification

Equipment \$9,813

The following items will be purchased from Bone Clones Inc. Bone Clones models are realistic models based on actual skeletons housed at the University of New Mexico Maxwell Museum of Anthropology and the San Diego Museum of Man. A cost share of **\$1,963**, 20% of the equipment cost, will be provided by the College of Arts and Sciences.

Human Female European Skeleton, Disarticulated	SCM-191-D	\$1,838
Human Male European Skeleton, Disarticulated	SCM-192-D	\$1,838
Human Female Asian Skeleton, Disarticulated	SC-211-D	\$1,675
Human Male Asian Skeleton, Disarticulated	SC-092-D	\$1,675
Human 14 to 16-month-old Child Skeleton, Disarticulated	SC-187-D	\$1,497
Skeleton Storage Case (x5)	S-16	\$1,290

Student Wages \$2,240

Undergraduate Research Assistant (Fall semester, 10 hours/week)

Student will assist in the 3-dimensional scanning of all materials and the creation of an online, digital collection to be shared and used in classes of varying size and level. Student will also have the option for course credit through ANTH 483: Independent Research.

TOTAL **\$12,053**

BIOGRAPHICAL SKETCH-COREY RAGSDALE, PH.D.

A. PROFESSIONAL PREPARATION:

Cal-State University, San Bernardino	Anthropology	B.A.	2008
University of New Mexico	Anthropology	M.S.	2011
	Anthropology	Ph.D.	2015

B. APPOINTMENTS:

Associate Professor, Southern Illinois University Edwardsville, Edwardsville, IL, 2022-present.

Assistant Professor, Southern Illinois University Edwardsville, Edwardsville, IL, 2016-2022. Visiting Assistant Professor, University of Montana, Missoula, MT, 2015-2016.

C. PRODUCTS:

Refereed Journal Articles

1. Ragsdale CS. 2017. Regional Population Structure in Postclassic Mexico. *Ancient Mesoamerica*. Online. doi:10.1017/S0956536117000013.
2. Ragsdale CS, Willermet C, and Edgar HJH. 2019. Detecting population replacement in Colonial Valley of Mexico and Morelos. *International Journal of Osteoarchaeology*.
3. Altschul JH, Kintigh KH, Aldenderferd M, Alonzie E, Armit I, Barcel JA, Beekman CS, Bicklef P, Bird DW, Ingram SE, Isayevk E, Kandell AW, Kiddey R, Kienon-Kabor HT, Niccolucci N, **Ragsdale CS**, Scaffidi BK, Ortman SG. 2020. To understand how migrations affect human securities, look to the past. *PNAS*.
4. Ragsdale CS, Willermet C, and Edgar HJH. 2019. Detecting population replacement in Colonial Valley of Mexico and Morelos. *International Journal of Osteoarchaeology*.
5. Ragsdale CS and Velemínský P. 2023. The effects of cultural networks on migration among Early and High Medieval populations in Central Europe based on dental phenotypic data. *International Journal of Osteoarchaeology*.

Refereed Book Chapters

1. Ragsdale CS, Edgar HJH. 2018. Population Continuity and Replacement in the prehistoric Valley of Mexico. In C Willermet and Cucina (editors), *Bioarchaeology of Pre-Columbian Mesoamerica: An Interdisciplinary Approach*. University of Florida Press.
2. Ragsdale CS. 2020. Population structure of El Palacio based on dental morphological data. In M Forest (editor), *El Palacio: Historiography and new perspectives on a pre-Tarascan city of northern Michoacán, Mexico*. Paris Monographs in American Archaeology 53. Oxford: British Archaeology Series.
3. Willermet C, Moes E, Rusk KM, Edgar HJH, and **Ragsdale CS**. 2022. A View of Stress and Inequality in Colonial Mexico City Through Cranial Fluctuating Asymmetry. In C. Willermet and HJH Edgar (editors), *1521: Biocultural Consequences of contact in Colonial Mexico*. University Press of Florida.
4. Ragsdale CS, Noldner LJ, Edgar HJH. 2024. Changes in population structure in the Jemez region. In Ann Stodder (editor), *Readings in Southwest Bioarchaeology*. Global Bioarchaeology Series. University of Florida Press.
5. Ragsdale CS, Velemínský P, Justice J. *In press*. Female mobility networks and their contribution to population and cultural growth in Central Europe during the Early and High Middle Ages. In Christine Lee and Katie Wolf (editors), *A Bioarchaeological Exploration of Women's Roles and Life Histories in Ancient Times: The Hidden Lives of Women*. Routledge Press.

D. SYNERGISTIC ACTIVITIES:

1. *Reviewer for journals, books, and funding agencies.* I have reviewed a text book, “How Humans Evolved, 7th Edition” as well as a refereed book, “Holes in the Head: The Art and Archaeology of Trepanation in Ancient Peru”, Published in *Journal of Anthropological Research*. 2016. I have also served as a reviewer for the *International Journal of Osteoarchaeology*. I have also reviewed an external grant application for the *Social Sciences and Humanities Research Council of Canada (SSHRC)*.
2. *Coordinator for integrative studies program.* I am currently the coordinator and director for the Forensic Science program at SIUE. My responsibilities include assessing curricular aspects of the minor and developing bachelor’s degree, coordinating inter-departmental collaborations, and connecting SIUE with law enforcement and medico-legal agencies.
3. *Faculty Advisor, Veteran Honor Society (SALUTE).* I am the faculty advisor for the newly established veteran honor society (SALUTE) at SIUE, as well as a faculty mentor for the veteran student association. My responsibilities include veteran student mentorship and co-organizing opportunities for veteran student involvement in projects on campus.
4. *External Member, Saint Louis University's Institutional Biosafety Committee (IBC).* I represent the interests of the surrounding area of St. Louis Metro East, as well as assess scientific validity and potential risks to the population regarding biological research at St. Louis University.
5. *Community leader in mortuary archaeology.* Along with my students, I am leading a restoration and preservation project for local cemeteries in the St. Louis Metro East region with historic components.
6. *International Coalition for Archaeological Synthesis.* Selected research member of a coalition appointed to research human migration, broadly, to develop a better scientific program and influence public policy.

Collaborators and Co-Authors

Dr. Andrea Cucina, Universidad Autonoma de Yucatan; Dr. Heather Edgar, University of New Mexico; Dr. Ann Stodder, Office of the State Archaeologist, New Mexico; Dr. Cathy Willermet, Central Michigan University; Dr. Lara Noldner, Office of the State Archaeologist, Iowa; Dr. Marion Forest, Arizona State University; Dr. Emiliano Melgar Tisoc, Museo del Templo Mayor; Dra. Josephina Bautista, Instituto Nacional de Antropologia e Historia, Mexico City; Dra. Estella Martinez Mora, Escuela de Antropologia e Historia; and Alexis O’Donnel, University of New Mexico.

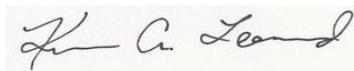
Graduate advisor. I have served on master’s committees for students not at SIUE: Brittney Eubank; Paula Specht; and Alejandro Arguelles (Mexico). I am currently a member of a PhD committee for a student at the University of New Mexico.

Undergraduate advisor. I have mentored senior theses at SIUE: Nigel Knudson; Kylie Heruth; Angel Nihells, non-traditional; Shanon Cronin, non-traditional; Molly Rench, non-traditional; Shawn Williams, underrepresented minority; Sarah Padgett, non-traditional; Hanna Oneal; Haley Ott; Allison Mitchell, non-traditional; John Justice; Caitlin Martin; Cody Bush; Carrington Gillam, non-traditional; Megan Walsh, non-traditional; Lydia Wegel; Emil Halasey, non-traditional; Shea Keener, non-traditional; Lauren Russel; and Robert Moorehead.

SOUTHERN ILLINOIS UNIVERSITY
EDWARDSVILLE

Date: February 28, 2024

From: Kevin Leonard, Dean, College of Arts and Sciences



Subject: EUE Dean Memo of Support

The College of Arts and Sciences strongly supports the application of Dr. Corey Ragsdale for an EUE grant for the purchase of high-quality skeletal materials for the Anthropology department. As the proposal notes, this equipment will significantly enhance and expand high impact practices in a variety of courses, supporting improved student learning in face-to-face and online courses, as the skeletal models will be digitized as well. Given that this proposal was approved, but unfunded in 2020, this funding request is a high priority. Notably, it will enable the department to address the required return of skeletal remains to the Illinois State Museum and ensures their ability to continue supporting majors and minors in the department, as well as our General Education and new Forensic Sciences program.

The budget goes directly to purchasing the needed equipment and to wages to support the student worker tasked with digitizing the skeletal materials for online course use. The Department of Anthropology and the College of Arts and Sciences are each contributing \$981.50 as cost share for a total of \$1,963. The proposal provides benefits beyond the project year, as the materials purchased and digitized would continue to be used in future years across a wide range of courses and modalities.

College of Arts and Sciences

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