

## Cover Memo

Please provide a description and highlights from all previous annual reports since your last periodic review.

The central goal of the LRI is to improve student success through cutting-edge scientific research designed to examine cognitive and neurobiological processes that contribute to classroom learning. It is our hope that the knowledge gained from this research will lead to the development of strategies that will help improve learning and the academic performance of CSUSB students.

CSUSB students play a significant role in the Institute's research activities. Although LRI activities are centered on better understanding student learning, a large portion of the Institute's resources are directed toward providing students with critical research-related experiences that help them advance to academic and professional careers. It is always our aim to include as many CSUSB students as possible in our research activities. The LRI provides support for students through scientific research training (research design, data collection, data analysis, and report writing), professional training (e.g., project management, computer programming), and research participation. A significant amount of Institute resources have been invested in students to provide them with the necessary research experience required for their advancement to academic and professional careers. The LRI also provides students with access to software, computers, and specialized research equipment that has played a role in facilitating their progress toward graduation. At the LRI, we take great pride in the amount of support we provide to students and are committed to include as many CSUSB students as possible in our research in the future.

In addition, each year many of our CSUSB student research assistants travel with us to international and regional conferences where they give presentations on research findings generated by the LRI. Such experiences allow students the opportunity to interact with researchers from other institutions and learn from experts in the field. Experiences like these have proven to be incredibly valuable to our students. Since we became co-Directors of the LRI we have mentored over 50 CSUSB students. Many of these students have gone on to graduate school at CSUSB, or entered Ph.D. programs at institutions such as Georgia Tech, Purdue University, UC Merced, Claremont Graduate University, and UCR.

We strongly believe that the activities we engage in with students as part of the LRI represent a valuable set of High Impact Practices that are consistent with the mission, goals, and objectives of CSUSB related to the promotion of student success and achievement.

Past Projects:

Role of Working Memory and Cognitive Inhibition in Classroom Settings

We completed a large-scale research project with Dr. Aaron Seitz, Professor of Psychology at UCR and Dr. Susan Jaeggi, Center for the Neurobiology of Learning and Memory at UCI, aimed at better understanding the role of working memory and inhibition in student learning and academic success. As part of this project we assessed the working memory capacity of more than 400 CSUSB students. The ultimate goal of this project was to develop a better understanding of how cognitive skills (e.g., working memory, executive function, and inhibition) relate to academic performance. We believe that such information will be valuable in helping students develop strategies to improve their academic success, and, consistent with the CSU 2025 Graduation Initiative, facilitate their progress toward graduation.

This project yielded some important information related to how working memory contributes to performance in both face-to-face and online virtual learning environments. These findings are especially relevant given the educational conditions we are currently operating under. A research project of this magnitude requires resources to support CSUSB student research assistants. Thus, we believe it is critical that support for this research project continues during the current academic year. Such collaboration with faculty at UCR and UCI is beneficial to not only our students, but to the university as a whole. We published one paper in a peer-reviewed journal and another is in preparation for publication based on the results of this work. In addition, multiple presentations based on this work were made at national conferences.

Effects of Emotion on Cognition, and Intervention with Mindfulness Meditation

Negative emotions such as anxiety and depression are prevalent problems among college students. According to APA (2013), anxiety is the top concern among college students (41.6 %), followed by depression (36.4 %), and relationship problems (35.8 %). Anxiety and depression interfere with cognition including attention, working memory, and reasoning because they consume mental resources. As a result, negative emotions such as anxiety and depression often have a negative impact on the academic performance and success of students.

In this project, we investigated the effects of mindfulness meditation on emotion and cognition in CSUSB students. Research has shown that mindfulness meditation is effective in improving cognition, emotion, and self-control. As a part of the faculty data follow project, in collaboration with CSUSB Institutional Research, we validated an objective measure of meditation, and assessed the academic, personality, social, and demographic traits of students to identify who might best benefit from mindfulness meditation training. Along with CSUSB student research assistants, we published one manuscript and we presented our results at multiple professional conferences.

Given the stressful educational conditions that students are currently operating under, we believe that it is critical for this project to continue. Being able to hire student research assistants on this project would allow us to develop a better understanding of the effects of anxiety and depression on the academic performance of students. We believe that if the LRI can develop effective intervention programs, including mindfulness meditation, we can contribute to improved student performance and increased graduation rates among CSUSB students.

**Ancillary Unit Periodic Review**  
**Reporting Period:** July 1, 2022 – June 30, 2023

Deadline for submission to Reporting Administrator: October 30

**This report is required by FAM 105.4 – POLICY GUIDELINES FOR THE FORMATION  
AND REVIEW OF CSUSB ANCILLARY UNITS**

**Basic Information**

Ancillary Unit's name	<b>Learning Research Institute (LRI)</b>
Director(s)	Jason Reimer and Hideya Koshino, Professors of Psychology
Administrator to whom the unit reports ("Reporting Administrator")	Christina Hassija, Dean – College of Social & Behavioral Sciences
Purpose and goals of the Ancillary Unit (from the original proposal or updated operating documents)	<p>The CSUSB Learning Research Institute (LRI) promotes an interdisciplinary scholarly focus on the student learning experience and how it may be improved. The Institute supports this focus by sponsoring and conducting research activities that examine the cognitive, neurobiological, and environmental variables that contribute to the academic success of our diverse student body.</p> <p>In addition, the Institute contributes to a campus culture supportive of student learning by hosting invited speakers, collaborating with other campus institutes, providing students the opportunity to be directly involved in the research process, and disseminating our research findings to the local and global communities.</p>

**Advisory Board**

Please list your current Advisory Board, their positions outside the Advisory Board, and their roles on the Advisory Board (if applicable)	<p>The LRI is currently working on updating the Advisory Board. The previous Advisory Board included Jean Peacock, Barbara Quarton, Young Suk Hwang, and Rowena Santiago.</p>
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### Ancillary Unit Activity

Please summarize the top three (3) accomplishments of your Ancillary Unit (AU) during this reporting period. This should highlight the substantive activities that support and advance the purpose/goals of the AU, and the relationship between the activities and the purpose/goals.

Please highlight the most significant activities of the AU that engage the community or other entities on campus, if any.

Substantive Activities undertaken by the AU during reporting period

Activity (please describe)	Funds spent	Goal advanced (and extent)
Dr. Koshino (in collaboration with John Clapper) submitted an NIH grant proposal (R16) in May, 2023 (see Attachment 1). Dr. Koshino and Dr. Clapper received a CSUSB Center and Institute seed grant (\$25,000).	\$0.0	Secure funding for the preparation of external grant proposals to fund future LRI research and community focused activities.
Publication of three manuscripts in peer-reviewed scientific journals. The manuscripts were based on research conducted by the LRI included participation of 9 CSUSB students. Three of those students were included as co-authors on one of the publications (see Attachment 2).	\$0.0	Dissemination of research, support of student and faculty professional growth, and enhancing partnerships between CSUSB and psychology community.
Completed four research projects designed to better understand the relationship between cognitive processes and student learning. Multiple undergraduate and graduate CSUSB students were involved in these projects as research assistants. Each worked closely with us and is receiving in-depth training on all aspects of scientific research. Research presentations based on this research was presented at two national conferences. 19 CSUSB students served as co-authors on those conference presentations (see Attachment 2).	\$0.0	Conduct research to advance our understanding of the cognitive processes underlying human learning and to support student and faculty professional growth.

**Describe planned activities for the current academic year and how each of them will advance the purpose/goals of the AU.**


Planned Activity	Connection to Purpose
<p>Emotional Attention Research Project: In this project, we investigate interactions between emotion and attention. Effects of emotion on cognition have long been ignored in the traditional cognitive psychology, because traditional cognitive psychology is based on the information processing paradigm, which is a computer metaphor of the human mind. However, recent years have seen a huge increase in the number of studies investigating relationships between emotion and cognition. We plan to continue focusing on the effects of anxiety on attention, because the proportion of people suffering some form of anxiety has been increasing in recent years, especially among college students. We all know that anxiety impairs our learning and cognition; however, how anxiety interferes with cognitive functions is not very well understood yet. Therefore, our short-term goal is to enhance our understanding of the interactions between anxiety and attention, but our long-term goal is to develop some intervention methods to help students who suffer from anxiety, including test anxiety and math anxiety.</p>	<p>Conduct research to advance our understanding of the cognitive processes underlying human learning and to support student and faculty professional growth. Multiple undergraduate and graduate CSUSB students are involved in this project as research assistants.</p>
<p>Educational Neuroscience: In this project, we investigate the underlying mechanisms of mindfulness meditation. Research has reported that mindfulness meditation improves our attention control, emotion regulation, self-control, and reduces anxiety and depression. However, the underlying mechanism of mindfulness meditation is not well known yet. We investigate cognitive, physiological, and social factors affecting mindfulness meditation. This project is conducted in collaboration with Dr. John Clapper.</p>	<p>Conduct research to advance our understanding of the cognitive processes underlying human learning and to support student and faculty professional growth. One psychology faculty member and multiple undergraduate and graduate CSUSB students are involved in this project as research assistants.</p>
<p>Reasoning and working memory: In collaboration with Dr. Bob Ricco, we investigate relationships between reasoning and working memory based on the dual process framework (e.g., Kahneman, 2012). The dual process framework claims that there are two types of processing: Type 1 processing and Type 2 processing. Type 1 processing is heuristic, intuitive, reflective, and doesn't require working memory resources, whereas Type 2 processing is algorithmic, logical, reflexive, and requires working memory resources. We investigate the roles of working memory and other thinking abilities and dispositions in various reasoning tasks, including conditional reasoning, denominator neglect, base rate neglect, and mathematical reasoning.</p>	<p>Conduct research to advance our understanding of the cognitive processes underlying human learning and to support student and faculty professional growth. One psychology faculty member and multiple undergraduate and graduate CSUSB students are involved in this project as research assistants.</p>
<p>Components of Inhibitory Control Research Project: This project is designed to better understand how common measures of inhibitory control relate to each other and work together to measure the inhibitory control construct. As part of the study, participants complete eight different inhibitory and working memory tasks and a set of questionnaires both in-person and remotely using Zoom and web-based data collection software. Participants complete three, 1-hour testing sessions across three sites (CSUSB, UCR, and UCI). For this project, we are collaborating with Dr. Aaron Seitz, Director of the Brain Game Center and Professor of Psychology at UCR, and Dr. Susanne Jaeggi, Director of the Center for the Neurobiology of Learning and Memory and Professor at UCI.</p>	<p>Conduct research to advance our understanding of the cognitive processes underlying human learning and to support student and faculty professional growth. Two faculty members and multiple undergraduate and graduate CSUSB students are involved in this project as research assistants.</p>

Complete the Annual Use of Funds form

	Year 1		Year 2		Year 3	
	Internal	External	Internal	External	Internal	External
Salaries	\$ 0	\$ 0	\$ 7,500	\$ 0	\$ 0	\$ 0
Assigned Time	\$ 0	\$ 0	\$ 12,200	\$ 0	\$ 0	\$ 0
Travel	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Supplies	\$ 0	\$ 0	\$ 3,994	\$ 0	\$ 0	\$ 0
Contractual	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Other*	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
<b>TOTAL</b>	\$ 0	\$ 0	\$ 23,694	\$ 0	\$ 0	\$ 0

\*Other can include items such as: *External Contracts, Grants, Sponsorships, Marketing and Outreach, Communications, Data Processing, Facilitates Operation, Printing, Postage*

Additional Attachments



Certification

Jason Reimer & Hideya Koshino

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Director Name

*Jason Reimer*  
*Hideya Koshino*

Jason Reimer (Oct 30, 2023 15:56 PDT)

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Director Signature

<b>Unit Reporting Person recommendation</b>	
Name and title: Christina Hassija, CSBS	
Recommendation:	Active
<p>Recommendations and comments including the criteria and data reviewed. Please attach additional page(s) as necessary.</p> <p>The Learning Research Institute sponsors and conducts research activities that examine the cognitive, neurobiological, and environmental variables that contribute to the academic success of our diverse student body. The institute has been active this past year and I appreciate the work of the center directors and associated faculty, and commend them on their publications, grant submissions, completed and ongoing research, and the opportunities they have provided for student research. I am pleased to see that the Center is assembling a new advisory board and look forward to working collaboratively to support future growth of the LRI. One challenge has been the loss of funding and assigned time for LRI directors and activities. I encourage the LRI to continue to identify opportunities (perhaps on the philanthropic side) to ensure sustainability.</p>	
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<b>Unit Reporting Person Signature</b>	<b>Date</b>