

Yearly Report for the Institute for Research and Innovation in STEM Education (RISE Institute)

2019-20

Michigan Technological University

The purpose of the Research and Innovation in STEM Education Institute (RISE Institute) is to recognize, strengthen and encourage collaboration in STEM education pedagogy through fundamental and discipline-based education research (DBER) and to establish Michigan Technological University as a leader in Michigan, the nation, and the world in the area of STEM education research. The current charter states that the RISE Institute will:

- Develop and serve a community of scholars engaged in fundamental and discipline-based education research.
- Promote collaborations with K-12 schools and educators; other institutions of higher education; and state, regional, and national stakeholders.
- Highlight the education research expertise of RISE faculty.
- Contribute to the Graduate Certificate in STEM Education and future graduate program development in the area of STEM Education.
- Act as a hub for DBER research centers that may be developed in the future.
- Provide methodological expertise and assessment for educational components of grants.

In September 2019 RISE the VPR's office granted a one-year extension until May 1, 2020 to develop a plan to combine with the Center for Leadership and Innovation for Transformation (LIFT) and Pre-College Innovative Outreach Institute (PIOI) to form the new Institute named Research and Innovation in STEAM Education Institute (RISE). The rationale for the combination was as follows: Each share a common goal, to develop innovative methods of engaging students in STEAM education. The combination of the Center/Institutes will facilitate the collaboration of STEAM related interdisciplinary learning, outreach activities, and discipline-based education research projects.

The Directors of the Center and Institutes carried out the plan for combination during 2019-20 to develop a proposal document and proposal presentation for the College Deans to review in May 2020. On May 20, 2020 the VPR office approved RISE for an 18-month renewal, with the new expiration date of December 31, 2021. During the upcoming 2020-21 year the RISE leadership will work with members to engage in a strategic planning process to deepen the development of RISE goals, and to address the recommendations of the Deans and VPR's office.

The RISE Institute activities for 2019-20 are aligned with the vision for Centers and Institutes on the Michigan Tech campus, which is to "help to promote interdisciplinary work that involves faculty from several different departments on and off campus". Examples of activities for 2019-20 are as follows:

- Updated advisory group in fall 2019 via zoom conference to review Charter.
- Communicated the planning process and updated progress for combining the Center/Institutes to current RISE membership via email.
- Met with PIOI and LIFT leadership to strategically plan for the combined institute.
- Collaborated in four proposals on interdisciplinary projects from Departments in the Colleges of Engineering, and Computing.

- Successfully negotiated a \$70,000 contract for starting up the 2020-21 secondary Career Technical Education Mechatronics program in collaboration with CCISD to be offered at Michigan Tech campus.
- The Institute has spent \$11,536 to support faculty research summer compensation. (See Appendix A for major expenditures)

Facts and Figures, Specific to Fiscal Year 2019-2020

- The IRAD 18% return generated by grants and other non-mandatory transfers associated with RISE through the last four quarters (2019-2020) provided a total revenue of \$7,698. (See Appendix B for total revenue and budget).
- There were two awarded grants affiliated with RISE in this fiscal year. (See Appendix C for a complete list)
- There were two proposals to NSF and two to US Department of Defense affiliated with RISE in this fiscal year. Two proposals were awarded and two were declined yielding a 50% success rate. (See Appendix D for a complete list)

Appendix A: Major expenditures

Category	Expense (\$)
Faculty research summer compensation: John Irwin, Institute Director	9,573.31
Fringe Benefits	1,962.52
Total Expenditures:	11,535.83

Appendix B: Total revenue & budget

Category	Expense (\$)
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IRAD Transfers In	7,034.09
Other Transfers In (MOU between SFI and RISE)	663.44
Total Revenue:	7,697.53
Carryforward:	20,345.31
Expenditures: (See Appendix A)	-11,535.83
Account Budget Balance:	16,507.01

Appendix C: Ongoing awarded proposals affiliated with RISE, 2019-2020

1) Michigan Middle School Master Teachers Fellowship Program

Date Submitted: 8/29/2017

Principal Investigator: Jacqueline E. Huntoon

Division/Dept: Administration/Provost Office

Co-PIs: Shari Stockero, Joshua A. Ellis, Kedmon N. Hungwe, and Amanda L. Gonczi

Sponsor: National Science Foundation

Requested Amount: \$1,887,979

Budget Start: 1/1/2018

Budget End: 12/30/2023

2) Collaborative Research: Building on MOSTs: Contributing to a Theory of Productive Use of Student Mathematical Thinking

Date Submitted: 12/2/2016

Principal Investigator: Shari Stockero

Division/Dept: College of Sciences and Arts/Cognitive and Learning Sciences

Sponsor: National Science Foundation

Requested Amount: \$590,590

Budget Start: 9/1/2017

Budget End: 8/31/2021

Appendix D: Proposals submitted affiliated with RISE, 2019-2020

Submitted Date	Principal Investigator	Division	Department	Status
08/19/2019	Audra N. Morse	College of Engineering	Civil & Environmental Engineering	declined
10/25/2019	Yu Cai	College of Computing	Applied Computing	declined
10/25/2019	Yu Cai	College of Computing	Applied Computing	*awarded
02/27/2020	Michelle E. Jarvie-Eggart	College of Engineering	Engineering Fundamentals	awarded

*PI moved the grant to the newly formed Computing Education Center (CEC) under the Institute of Computing and Cybersystems (ICC)