



### *iApply: Early Interdisciplinary Applied Strategies to Strengthen STEM Education and Research at SSU*



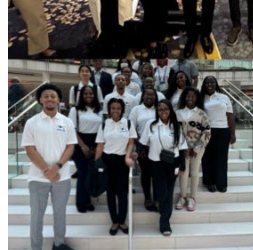
The National Science Foundation (NSF) awarded SSU a five-year grant (\$2.25 M) to increase the number of underrepresented students who earn STEM BS degrees and enter STEM graduate programs and careers. This grant titled ‘*Early Interdisciplinary Applied Strategies (iApply)*’ has a long-term goal of maintaining student interest in STEM career paths and increasing SSU STEM student retention to improve graduation rates while enhancing the future diversity of the STEM research workforce. This project incorporates innovative strategies that include: 1) Curriculum Reform-Introductory STEM lab courses are being redesigned to emphasize active learning and virtual reality (VR) enhancements; 2) Faculty Development-Faculty are being trained on course redesign principles for the lab enhancements and can participate in the iApply Faculty Awareness and Commitment to Excellence (FACE) training program; and 3) Student Development-Students are exposed to applied inter-disciplinary research training through a team-based approach .



#### IAPPLY PROGRAM TEAM

- Dr. Chellu S. Chetty** (PI)  
*Regents Distinguished Prof. of Biol.(Retired)*
- Dr. Teresa Shakespeare** (Lead Co-PI)  
*Professor & Chair, Biology*
- Dr. Manoj Prasad** (Co-PI)  
*Associate Prof. Chem. & Forensic Science*
- Prof. Veena Thapliyal** (Co-PI)  
*Lecturer, Dept of Chem. & Forensic Science*
- Mr. Anthony Palacios**  
*VR Research Technician*
- Mr. Alex Pierce**  
*Project Coordinator*
- Dr. Lisa Yount**  
*Faculty Research Mentor*
- Faculty Research/ Education Consultant:**  
**Dr. Phyllis Blumberg**, *Education Research Consultant, Philadelphia, PA*
- Dr. Karla-Sue Marriott**, *(Consultant) Prof. & Director- Forensic Science (RWU, RI*
- External Advisory Board Members:**  
**Dr. Jamboor K. Vishwanatha**  
*UNTHSC, Fort Worth, TX*
- Dr. Monica Mitchell**  
*MERA Associates, (Vienna, VA)*

Target	Activities	Outcome
Students	<ul style="list-style-type: none"> <li>• Early, Active Learning</li> <li>• STEM-VR inspired creativity</li> <li>• Applied, Interdisciplinary Research Training</li> <li>• Targeted student mentored training</li> </ul>	<ul style="list-style-type: none"> <li>• Innovative and applied learning</li> <li>• Undergraduate research experience</li> <li>• Successful graduation and career</li> <li>• Student retention in STEM major</li> </ul>
Curriculum	<ul style="list-style-type: none"> <li>• Transform STEM learning through lab curriculum reform</li> <li>• Student centered-STEM VR teaching and learning inclusion</li> </ul>	<ul style="list-style-type: none"> <li>• Engaging and immersive lab curriculum</li> <li>• Application based reformed courses</li> <li>• STEM VR enhanced courses</li> </ul>
Faculty	<ul style="list-style-type: none"> <li>• Interdisciplinary applied STEM research projects</li> <li>• Training in STEM VR curriculum enhancement</li> <li>• Self-reflective professional development and peer mentoring</li> </ul>	<ul style="list-style-type: none"> <li>• Multidisciplinary STEM faculty teams</li> <li>• VR classroom trained faculty</li> <li>• Engaging student centered teaching</li> </ul>



Students Cohort 4	Major
Adonis Thomas	Biology
Corinne Smiley	Chemistry
Makayla Ellis	Biology
Mikayla Mathis	Biology
Moriana Rankins	Chemistry
Synia McDonald	Biology
Taiylier Johnson	Forensic Science
Jarrod Giddings	Biology
Austin Williams	Biology
Shamari Bailey	Chemistry
Shai McKenny	Mech. Engr. Tech.
Jala George	Biology
Tyran Moss	Elect. Engr. Tech
Jada Chapman	Forensic Science
Olivia White	Biology

**iApply Scholar Interdisciplinary Research:**

- ✓ Participation in comprehensive AY and summer research training
- ✓ Research experience in multidisciplinary teams across departments
- ✓ Mentoring and professional development using advanced technology
- ✓ Travel support to attend and present at national conferences
- ✓ Creative development of useful products with an emphasis on scientific integrity and ethical conduct

**iApply Student Scholar Requirements:**

- ✓ Full-time sophomore/junior students majoring in Biology, Chemistry, Forensic, Behavior Analysis and Computer Science
- ✓ Minimum GPA of 2.8 or higher
- ✓ Student with under-represented status
- ✓ US citizen or Permanent Resident

**Curriculum Transformation**

STEM faculty (Transform) trained through this program continued the transformation of STEM teaching and learning in year 4. This team of faculty are trained in VR required for curricular transformation for STEM lab courses.

**Transform Faculty Cohort 4**

Veena Thapliyal (Chemistry)	Manoj Prasad (Chemistry)	Teresa Shakespeare (Biology)	Lina Merchan (Physics)
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*These transform faculty will perform curriculum transformation of additional STEM courses during Fall 2024 and Spring 2025.*

**Faculty Mentors: Interdisciplinary Research Training**

Group A	Group B	Group C
-*Teresa Shakespeare (SSU- Biology)	-*Manoj Prasad (SSU- Chemistry)	-*David Hongo (SSU-Biology)
-Johnny Johnson (SSU-Biology)	-Takayuki Nitta, (SSU-Biology)	-Asamoah Bosomtwi Scientist (Augusta University)
-Dr. Sandra Murray (Univ. of Pittsburgh)	-Karyn Cotta (South Univ- Pharmacy)	-Tao Haung (SSU-Chemistry)
*Group leader		

**Faculty Awareness and Commitment to Excellence (FACE) Training Program:**

This program provides annual professional development and education research support for 7 STEM faculty to inspire and sustain continuous curriculum reforms that will meet the needs of our undergraduates. The goal is to: 1) Update STEM course curriculum, refresh and reform teaching and learning environments; 2) Facilitate strengthening the ability of students to be dynamic learners, thinkers, and creative innovators, well- prepared to be productive members of the scientific community.

**FACE Faculty Cohort 4**

Dr. Catherine Gayle	Dr. Takiyura Nitta	Dr. Hyounkyun Oh
Dr. Otilia Iancu	Dr. Sujin Kim	Dr. LaKesha Cole

*This summer, FACE faculty will participate in a week-long set of workshops June 10-14, 2024*

**Faculty Development:**

- ✓ Dr. Chetty presented (virtual) program high-lights on 3/6/24 at 2024 ERN Conference .
- ✓ Dr. Prasad attended 2024 ERN Conference (Washington DC) with 16 iAPPLY scholars.
- ✓ Cohort 3 scholars presented 3 posters at 2024 ERN Conference.
- ✓ iAPPLY scholars presented 4 posters at SSU's 2024 Annual Research Conference.
- ✓ iApply scholars attended 8 lab workshops/ virtual presentations by scientists during Spring 2024