Introductions

- Lisa Kroutil – Chemistry Faculty & Chemistry PLTL Coordinator
- Jamie Schneider – Chemistry Faculty & STEP Grant data collection and analysis
- Arriety Lowell – Physics Instructor & Studio Physics Coordinator
- Nathan Wildenberg – PLTL Leader and Learning Assistant (Chemistry & Physics Secondary Education Major)
- Kathy Tomlinson – Math Faculty (Former Chair & Math LA Coordinator)
- Glenn Spiczak – Physics Faculty and Administrative Fellow for Academic Planning
How familiar are you with the following practices?

- Peer Led Team Learning
- Studio Physics
- Learning Assistants
What does Peer Assisted Learning look like at UWRF?

- Peer Led Team Learning - Chemistry & Physics
- Studio Physics
- Learning Assistants - Math, Chemistry, Physics & Neuroscience
  - Each department uses a slightly different model for Learning Assistants
Chemistry – Components of PLTL

Critical Components identified by PLTL developers:

- **Appropriate workshop materials**
  - Challenge level
  - Format for team learning

- **Leader training**
  - No answer keys!
  - UNIV 200 & 201

- **Integrated into curriculum**
  - Optional participation (typically 10-15% of students went to at least ½ sessions)
  - Attendance issues
  - F18 and F19 shift to required discussion in General Chemistry I

- **Close involvement of instructors**
  - Workshop materials developed in consultation with course instructors

- **Organizational arrangements promote learning**
  - Small classrooms with lots of board space

- **Administrative support**
## Peer Led Team Learning - Chemistry

<table>
<thead>
<tr>
<th>Courses</th>
<th>Years</th>
<th>Funding Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Chemistry I &amp; II</td>
<td>2014-15</td>
<td>Grant funding to increase student in introductory chemistry courses for early STEM success</td>
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<tr>
<td>General Chemistry I &amp; II; Introduction to Organic Chemistry; Organic Chemistry I</td>
<td>2015-16</td>
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</tr>
<tr>
<td>General Chemistry I &amp; II; Introduction to Organic Chemistry; Organic Chemistry I &amp; II</td>
<td>2016-17 &amp; 2017-18</td>
<td>Grant funding to increase student in introductory chemistry courses for early STEM success</td>
</tr>
<tr>
<td>General Chemistry I; Introduction to Organic Chemistry; Organic Chemistry I</td>
<td>2019</td>
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Math - Key Components of Learning Assistant Implementation

- Student Learning Assistant recently completed the course they support.
- Student Learning Assistant (LA) attends class each day.
- When students are working in groups, LA circulates around the classroom providing support to groups.
- LA aids the instructor in conducting productive discussion by helping to discern and resolve common points of confusion.
- LA meets with course instructor on a weekly basis to discuss effective classroom interactions.
- LA leads supplementary help sessions prior to exams.
## Learning Assistant Implementation in UWRF Mathematics Courses

<table>
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<tr>
<th>Courses</th>
<th>Years</th>
<th>Funding Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Algebra</td>
<td>2014-15</td>
<td>Grant funding to increase student interest in mathematics education</td>
</tr>
<tr>
<td>Precalculus</td>
<td>2015-16</td>
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<tr>
<td>Business Calculus</td>
<td>2016-17</td>
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<tr>
<td>Calculus I</td>
<td></td>
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<tr>
<td>Math for Elementary Education</td>
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<tr>
<td>Linear Algebra</td>
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<tr>
<td>Geometry</td>
<td>2017-18</td>
<td>Volunteer work for Honors Program Service-Learning Requirement</td>
</tr>
<tr>
<td>Complex Analysis</td>
<td>2018-19</td>
<td></td>
</tr>
</tbody>
</table>
Studio Physics – Active Learning with Learning Assistants

- 2014 converted introductory physics courses from traditional lecture and lab class into studio model
- Classes meet 4x per week, alternating 50 minute and 110 minute blocks
- Long blocks have Learning Assistants
Physics Learning Assistants

- Students who have previously taken the course (or a similar one), with instructor recommendation
- Work in the classroom with the students
- Work outside the classroom with the Learning Assistant Coordinator and the instructors

Critical Components

- Not TA's – They have no responsibility beyond providing a supportive learning environment and helping the current students engage with the material
- Not a walking answer bank LA's do not give answers, they help students problem solve and think critically about the results
- LA's are trained and supported by the coordinator AND the instructors
Interest

- What programs are you interested in implementing?
- What would success look like to you?
- What benefits do you desire?
Our PLTL success

- PLTL participant course grades consistently higher
- Largest impact with 1st term courses (General Chemistry I and Introduction to Organic Chemistry), both significant \( p<0.01 \)
  - Similar but not same HS background
- Mandatory PLTL significant increase in standardized final exam performance and course grade

- Participants with PLTL in 1st term persisted to later terms at significantly higher rates \( (p<0.05) \)
- Similar results for participants with PLTL in first two terms
A Student Leader Perspective

- As an LA for physics, I can interact some with the students and help guide them while they are in the class and focused on the material.

- As a PLTL leader, I am able to have closer interactions with the students and get to know them better.
  - As a team the students grow together: better collaboration and trust in problem solving.
  - Cautionary note: fine line between peer and peer leader, it can also mean students are slightly more apt for distraction.
Physics Learning Assistants – Benefits

Everyone

Student Benefits
■ Role models for success
■ Professionally coordinated support
■ Opportunities to engage in elaborative explanation
■ Alternative sources of help
■ Improved classroom culture
■ Increased student learning and retention
■ Increased student engagement and ownership
■ Emphasizing sense making and reasoning
■ Learning more about thinking

Learning Assistant Benefits
■ Expanded practice and understanding of content
■ Pedagogy and techniques for teaching
■ Navigating and facilitating group dynamics, leadership skills/roles
■ Risk taking in problem solving and learning
■ Evidence based study skills
■ Understanding of student demographics
■ Exploration of race, culture and gender identity in the classroom
Dialog about implementation

- Have you implemented any of these practices? If so, for how long?
- What are the challenges of implementing these programs?
- How have you addressed them?
Challenges we have faced:

- Faculty adoption
- Student acceptance & commitment
- Peer Leader & Learning Assistant availability/scheduling
- Administrative support
- Funding
Administrative Support:

■ Provost: 25% Faculty reassign time, Administrative Fellow for Academic Planning
  - Society for College and University Planning Workshop, summer 2019
  - Internal & Environmental Scanning, Surveys and data gathering underway
  - Academic vision, goals, strategies, and tactics are being developed
  - Metrics envisioned to include some measure of Peer Learning experiences

■ CAS Dean: Reimagining Liberal Arts initiative
  - Expected to emphasize engagement in multiple High-Impact Practices
  - Focus also on retention, shown to improve with Peer Learning

■ Chancellor: Funding set aside for Strategic Planning Initiatives
  - Proposals compete annually for funds supporting goals, not all successfully
  - One of the three goals to “foster an inclusive, challenging, learner-centered environment”
  - Strong push for inclusion of Peer Learning in new 2020 plan under construction
How do we move forward?

- Chemistry PLTL
  - Student driven – if administrative support falls through
  - Exploring a PLTL student organization
  - Workshop time funded through Tutoring Services
  - Training
    - Online certification
    - Continuing training by course instructor
  - Scheduling & paperwork – club officers
  - Copying
    - Bookstore packet
    - Course instructor responsibility

- Physics Active-Learning Classrooms (ALC)
  - New ALC being remodeled for Fall 2020
  - Example shown in picture on right
Learning Assistant References and Resources – a very small selection

- Learning Assistant Alliance [https://www.learningassistantalliance.org](https://www.learningassistantalliance.org)
- B. Cohen & L. Doughty 2016 2016 Physics Education Research Conference Proceedings Theoretically Framing a Complex Phenomenon: Student Success in Large Enrollment Active Learning Courses
- White, R., Van Dusen 2016 2016 Physics Education Research Conference Proceedings The Impacts of Learning Assistants on Student Learning of Physics
Acknowledgements

- Funding, National Science Foundation STEP program (Grant DUE-1317149), PI Michael Kahlow.
- External evaluator, Dr. Frances Lawrenz (University of Minnesota)
- Survival statistics consultant, Gary Oehlert (University of Minnesota)
- External advisory panel, Drs. Laura McCullough (UW-Stout, Physics), Jennifer Mihalick (UW-Oshkosh, Chemistry), and David Bressoud (Macalester College, Math).
- Any opinion, findings, and conclusions or recommendations expressed in this material are those of the authors(s) and do not necessarily reflect the views of the National Science Foundation.