



**The University of Alabama
Developing Leaders in Science Teaching Program**



Developing Leaders in Science Teaching (LIST) Program: Overview1

The University of Alabama, National Science Foundation funded, Noyce teaching fellows program is a partnership with the University of Alabama; two Alabama Local Education Agencies (LEAs) - Tuscaloosa City Schools and Tuscaloosa County Schools; the Texas STEM Coalition (T-STEM); and the state funded Alabama Math, Science, and Technology Initiative (AMSTI/ASIM). The program will provide STEM graduates/professionals in biology, chemistry or physics with secondary science certification. The aim is to fast track participants in a strong clinically-based program with emphasis on developing their skills in engaging diverse students in high needs schools. The program has the goal of moving its teachers in an induction program from mentored novices to teacher leaders in the education community through long term mentoring via PLCs. Its impacts will demonstrate a transformative model constructed through a 3-way collaboration between new teachers, professionals in the university, and professionals in LEAs. The project's timeline (see Figure 1) begins in Year 1 with preservice coursework ending with graduation and teacher certification in an MA program. A 4 year induction program follows in LEAs for the new LIST certified teachers.

One important element of LIST is the formation and use of a professional learning community, or PLC Group, for each fellow.

STRUCTURE

Year 1 PLC: The LIST fellows will be involved in one year of coursework and continuous clinical and internship classroom placement working with a pre-service partnership team, their Pre-service PLC group, consisting of a NSF Fellow, Directing Teacher, UA science Discipline Faculty member, and a UA Science Education Faculty member. The PLC Group members will match the Fellow's disciplinary certification and major. The Year 1 PLC group will regularly meet face to face and occasionally online in the fall 2018 and spring 2019.

Year 2-5 PLC: The LIST fellows will be involved in teaching full time in a school, located locally or at a distance, working continuously with an in-service partnership team, their Inservice PLC group, consisting of an NSF Fellow (now a teacher), Mentor Science Teacher in the same school, UA science Discipline Faculty member, and a UA faculty Science Education Faculty member. The PLC Group members will match the Fellow's disciplinary certification and major. The Year 2-5 PLC will regularly meet online and occasionally face to face if the school is local during each school year.

FUNCTION

The PLC is a group of educators that meets regularly, shares expertise, and works collaboratively to improve teaching skills and the academic performance of students. The term PLC Group is applied to teaching faculties who use small-group collaboration as a form of pre-service or inservice professional development, either with 1) a focus on professional learning or 2) use collaboration as a means to achieve professional learning (Allen & Blythe, 2015). Shirley Hord, an expert on school leadership, came up with perhaps the most efficient description of the strategy: "The three words explain the concept: Professionals coming together in a group—a community—to learn" (Hord, 1997)

Professional learning communities tend serve to two broad purposes: (1) improving the skills and knowledge of educators through collaborative study, expertise exchange, and professional dialogue, and (2) improving the educational aspirations, achievement, and attainment of students in classrooms through

stronger leadership and teaching. Professional learning communities often function as a form of action or practitioner research—i.e., as a way to continually question, reevaluate, refine, and improve teaching strategies and knowledge. Meetings are goal-driven exchanges facilitated by educators who have been trained to lead professional learning communities.

In professional learning communities, teams are often built around shared roles or responsibilities. For example, the teachers in a particular group may all teach biology to tenth-grade students in a school or they may all teach 9th-12th grade science in a high school, and these shared attributes allow participants to focus on specific problems and strategies—How do I teach *this* particular student better? Does the teaching activity describe an accurate meaning of this science concept? How do I teach *this* scientific theory more effectively?—rather than on general educational goals or theories. Teachers, for example, will discuss and reflect on their instructional techniques, lesson designs, and assessment practices, which eventually may address science teaching leadership questions, strategies, and issues.

While the specific activities and goals of a professional learning community may vary widely from school to school, the following are a few examples of common activities that may take place in meetings:

- **Discussing lesson plans:** Participants collectively review plans for a future single lesson and then offer critical feedback and recommendations for improvement of objectives, science content and depth, and alternative ways to develop the lesson.
- **Discussing teacher work:** Participants collectively review lesson plans or assessments that have been used in a class, and then offer critical feedback and recommendations for improvement.
- **Discussing classroom management:** Participants collectively review observational reports or assessments for a class lesson, and then offer critical feedback and recommendations for improvement.
- **Discussing student work:** Participants look at examples of student work turned in for a class, and then offer recommendations on how lessons or teaching approaches may be modified to improve the quality of student work.
- **Discussing student data:** Participants analyze student-performance data from a class to identify trends—such as which students are consistently failing or underperforming—and collaboratively develop proactive teaching and support strategies to help students who may be struggling academically.
- **Planning, conducting, and analyzing data from an action research activity** conducted by the group to evaluate the impact of an innovative instructional strategy or curriculum implemented.
- **Discussing professional literature:** Participants select materials to read, such as a research study or an article about a specialized instructional technique, and then engage in a structured conversation about the text and how it can help inform or improve their teaching.

The LIST PLC team plan is for physics-faculty support for the physics majors in the LIST program and chemistry support for the chemistry majors etc. Since the NSF Fellows will be certified for general science, and teaching general science and major courses we will also consider providing some physics support for chemistry and biology majors and vice versa - at least bringing in expertise support from other teams when needed, virtually or face-to-face.

Bibliography

- Allen, D., & Blythe, Tina (2015). *Facilitating for learning: Tools for teacher groups of all kinds*. New York: Teacher's College Press.
- Hord, Shirley, 1997. *Professional Learning Communities: Communities of continuous inquiry and improvement*, Austin, TX: Southwest Educational Development Laboratory