



## TRANSFORMING Innovations into REALITY in SCIENCE (TIRS)

### INSTALLMENT II Transformation to Carry Out Our STANYS Purpose

Kenneth L. Huff, STANYS President-elect  
[khuff@williamsvillek12.org](mailto:khuff@williamsvillek12.org)



I trust those of you who attended the recent Annual Conference in Rochester found the professional learning experiences to be rewarding and meaningful to your work in science education. There were many enlightening workshops and thoughtful conversations throughout the weekend. The 124<sup>th</sup> STANYS Annual Conference will occur from November 1-4, 2019 in Rochester. Please make note of these dates on your calendar. I am delighted to inform you several new events are already confirmed.

In the first installment around the theme Transforming Innovations into Reality in Science (TIRS), I discussed the critical role of teachers of science in the transformation process. I also addressed why we need to transform in light of our new science standards. As STANYS members, we continue to move forward volunteering our time to ensure standards implementation is consistent with the new vision for science education.

In this second installment, I will discuss how TIRS requires that STANYS possess a systems approach to this transformation process. In a systemic approach, there are multiple components

in the system. Our new standards (policy) are in place, the next step involves implementation. The three components include:

1. STANYS and teachers of science
2. Policies and programs
3. Shareholders outside the classroom

These three components matter because they are all instrumental in helping students develop transferable knowledge for the 21<sup>st</sup> century.

TIRS will only occur when teachers of science, science teaching, and student learning transform. This includes making our STANYS purpose explicit: promoting excellence in science education and the teaching of science. Our learning experiences should continue to prepare professional educators with the knowledge and skill to implement the three dimensional vision of science learning presented in A Framework for K-12 Science Education and our New York State Science Learning Standards.

The idea of transformation in science education has appeared in the literature for decades. In the 1985 National Science Teachers Association year-book, Rodger Bybee acknowledged the reluctance to transform but argued the reasons and responsibilities to transform were compelling. Today, we also have a choice. Transformation in science education presents every STANYS member with opportunities. The task of developing programs and implementing practices are awaiting our attention as we approach 2020.

Policies (e.g., standards) and programs (e.g., curriculum) grounded in research on how children learn science call for new and different pedagogical knowledge and approaches, which we as teachers of science must acknowledge. It is through diligent attempts to contextualize research findings that we create increased understanding as to how they relate to science teaching and learning. Science education has always been in a process of change, and sometimes there are significant periods of transformation. As teachers of science, we must view our profession as an evolving “population” that can transform to environmental changes brought forth by A Framework for K-12 Science Education and our New York State Science Learning Standards. Two components of this transformation are:

1. Teachers’ pedagogical knowledge and approaches must align with programs;
2. Teachers must have opportunities to engage with new programs as they develop new pedagogical knowledge and approaches.

It is helpful to consider the parallels that exist between biological evolution and educational transformation. Both biological evolution and educational transformation involve pressures, which act on the population. Transformations in science education occur in environments of widespread evolution. Throughout New York State, there are large variations among school districts and within each district. This translates into variations in components that comprise the system. How People Learn II (National Research Council, 2018) asserts learning involves lasting adaptations of multiple systems to the changing external and internal environment. Successful transformation within the science education system requires all of its components respond to changes in the environment.

In his book *The Predictable Failure of Educational Reform* (1991), Seymour Sarason, argued that unless educators confront social, political, and organizational dimensions of reform, reform will fail. Sarason proposed a systems approach to educational reform because the mistakes have been many. Almost all of these mistakes came from the inability to comprehend the nature of school systems. As members of STANYS, we can draw upon A Framework for K-12 Science Education, which brings greater coherence and continuity to the system.

Shareholders outside the classroom place heavy burdens on teachers of science. Often there is little acknowledgement of our accomplishments nor recognition of our needs or support for the transformation required. Shareholders not in the classroom can work to support those who are ultimately responsible for this transformation. Transformation will not be easy. It will be complex as it moves from the abstract concept to practical application in the classroom. The new science standards have already helped and provide us with new opportunities. However, improved science teaching and learning will ultimately be the difference. We can give in to the forces not to transform or we can continue to move our STANYS purpose forward.

Our students demand a transformation in our classrooms. As professional teachers of science, our role is central. The critical decisions we make about interactions with students and pedagogical knowledge and approaches we implement will lead to students who possess 21<sup>st</sup> century competencies. I exhort all STANYS members to unite around our purpose and will provide more specific steps and strategies in future installments.

Best wishes for a safe and enjoyable holiday season among family and friends.