

Bybee NSTA Reading

Introduction:

- Need for leadership from science educators is driven by changes in education system (pandemic) and climate change
- Science teachers collectively look for others for leadership rather than look for it within themselves
 - I disagree with this statement. While yes I do believe some teachers just want to do the bare minimum, the vast majority in my experience already go above and beyond. There is the issue of time not being enough for us to be able to do these tasks. Teachers are given more and more tasks and responsibilities year after year and need a work-life balance. It is especially discouraging to ask more work from teachers when there is often no extra pay involved.
- I agree with the thought that we science teachers need to be the ones making the decisions about curriculum, however there needs to be a trade off, it simply cannot be another task for us to take on our already overloaded plates
- Studies show that schools with teachers who are involved in instructional leadership have students that perform better on Math and English assessments than those without

Part 1

Ch.1 My Science Teaching

- Julie Olsen is a high school teacher in a small, rural school (at alternative HS campus)
- “You might not be successful every time, but if you are doing it with the best of intentions and in the best interests of your students, you will be okay. Just regroup and continue on.” - love this quote
- Author’s insights after observing Julie’s classroom:
 - Leaders have to trust in others.
 - Assuming leadership can be frightening and takes courage.
 - Leaders have to model resilience.
 - Leaders should continue to expand their experiences and bring what they have learned back to the classroom.

Ch.2 My Classroom and a Vision of Where the Rubber Meets the Road

- Kenneth Huff has a passion for Earth and space science

- He is also president of STANYS (Science Teachers Association of New York State)
- He coined an acronym together, “TIRS”:
 - *Transformation* represents new ways of thinking about science teaching and student learning.
 - *Innovations* refers to how we reinvent ourselves by looking for opportunities to grow as science teachers and educators.
 - *Reality* is the understanding that new standards are here, and we have an obligation as professionals to move beyond the status quo and implement science programs and practices aligned with these standards.
 - *Science* includes our current understanding of natural systems and the processes by which knowledge is revised as new evidence emerges.
- TIRS provides opportunities to empower science teachers through leadership and to take on the responsibility of education reform

Ch.3 Leadership as an Early-Career Elementary School Teacher

- Cassie Bess teaches 6th grade (all subjects)
- Her 3 guiding principles are dedication, self-reflection, and connections
- She consistently reflected on her need for growth but also her areas of strength, this helped her connect to her students more
- She stresses the importance of allowing students to have choice in their interests when possible
- She prioritizes students’ needs in her leadership

Nature of STEM Reading

- Content knowledge is not enough to develop literate citizenry
- Students need to understand why they are learning not just what they are learning
- The ultimate goal is integrated STEM education (design, inquiry, analysis, and skills practiced in STEM)
- “Nature of STEM” refers to the inherent guidelines that scientists follow in order to cultivate valid ideas about the natural world
- Nature of Technology refers to features of technological advancements that extend humans’ abilities to shape the world ranging from survival needs to aesthetics
- These both involve the study of humans influencing the world as well as understanding the mechanisms in nature
- Determining the existence of NOSTEM and how to teach it is a necessary step toward understanding the benefits and barriers of integrated STEM in K-12 education.

Qualities of a Good Anchor Phenomena

- “Anchors” are compelling natural phenomena that involve engaging in science and engineering practices
- Anchors should include the following:
 - Builds upon family/everyday experiences; especially underrepresented communities
 - Require students to develop solid understanding of science/math principles
 - Complex and not able to be provided just after one lesson
 - Observable (lab/video/hands-on activity, etc.)
 - Can be a case study, something puzzling, or a “I wonder” topic
 - Includes relevant data, text, images, etc. for students to observe and investigate
 - Has an audience or stakeholder involved that cares