Unit 3 - Pedagogy Strand

Teacher's Role in the Learning Process
This week's pedagogy section will address possible changes in a teacher's role with the increased application of technology and demand for computational thinking in the classroom and in the workforce. First we will explore one model for teaching - that of a teacher as a more experienced learner, but still "co-learner" (sometimes referred to as a "guide on the side" vs a "sage on the stage"). Next, we will look at the ISTE's performance indicators for teachers with a focus on "co-learning".

Teacher as a "Co-Learner"
Early in the age of teaching with computers, a let of effort went into figuring out teachers could make use of technology to become a more efficient, and how best to transmit information to students through technology. More recently, however, there has been an increased focus on teachers acting as a "co-learner" instead - facilitating students as they learn from many sources, rather than being the one source of all knowledge on a subject. Since middle and high school curricula now demanding creativity and innovation (so-called 21st Century skills) from students, teachers, especially those that wish to teach computing and other technologies, which rapidly change, must being willing to step into the uncertain, and allow their students to explore topics they, as teachers, may not be full masters of to start.

For example, many science classrooms include a lab component, but most of the time, students make hypotheses and perform experiments with no doubt about what the outcome is (or at least should) be. While these labs allows students to emulate some parts of a scientific process, it does not challenge them to abstract a problem, design a less-than-obvious data collection process or evaluate the legitimacy of an outcome. In order to challenge students' creativity and increase their design abilities, teachers can assign or otherwise encourage students to tackle problems that are not directly addressed by a textbook, even going so far as allowing students to choose their own ideas to study, within the bounds of the topic at hand, even if they are unfamiliar to the teachers. This however, requires trust in students to choose appropriately challenging topics, which is a skill to facilitate, and trust in your own abilities to learn along with the students and even to let them be the "experts" on a particular topic. This may seem daunting, and like losing control of a classroom, but in fact, it's freeing - instead of having to maintain a fragile control of a class, it is usually the case that students learn to trust and respect you more as you give them the freedom to be the drivers of their own learning.

Five (Major) New Performance Indicators for Teachers
(Taken from the ISTE Teacher Standards, Reading #3 below)
1. Facilitate and inspire student learning and creativity
   - Teachers use subject matter and technology to facilitate experiences that advance student learning, creativity, innovation, inventiveness, reflection, conceptual understanding and thinking, planning and creative processes.

2. Design and develop digital age learning experiences and assessments
   - Teachers design, develop and evaluate technology-enriched learning and assessments by incorporating 21st century tools and resources to maximize learning and develop knowledge, skills and attitudes. Teachers should address students; diverse learning styles and provide multiple and varies resources and assessments.
3. Model digital age work and learning
   - Teachers exhibit knowledge, skills and work representative of an innovative professional in a global and digital society
4. Promote and model digital citizenship and responsibility
   - Teachers understand the responsibilities and risks in an evolving digital culture and exhibits legal and ethical behavior in their professional practices.
5. Engage in professional growth and leadership
   - Teachers continuously improve their professional practice, model lifelong learning and promote and demonstrate the effective use of digital tools and resources.

All of the above criteria not only emphasize the presence of digital age technologies in the classroom, but also the role of teacher as a model of a life-long learner. Again, this demonstrates the teacher as a "co-learner" in the classroom.

Readings & Videos:
1. [Salman Kahn: Let's use video to reinvent education](#)
   - Ted Talk by Sal Kahn; specific to online learning through videos and problems and Khan academy
   - Argues for the use of online instruction heavily; could be a good introduction to online learning in general
2. [The Future of Instruction: Teacher as a 'Co-Learner'](#)
   - Redefines the role of teachers
   - Sets new standards and performance indications for effective teachers of digital-age learners
3. [International Society for Technology in Education (ISTE) Standards: Teachers](#)
4. [ISTE Standards: Computer Science Educators](#)

Reflection Questions:
Think about the following:
1. How does a teacher acting as a "co-learner" encourage students to engage in greater computational thinking?
2. An activity that you currently do, or that you've seen a colleague do, that could be modified so the teacher becomes a "guide on the side" instead of a "sage on the stage".
3. If you choose to go this route, what changes, if any, would you need to make to your classroom structure to become a "co-learner"?

Additional Issues to Consider:

1. What are the challenges that could be faced by a teacher as a "co-learner"? How could you, or another teacher, address those challenges?
2. Do you feel like the performance indicators listed above are relevant to your situation? Are you evaluated by these criteria? If yes, does it seem fair and appropriate? If no, what performance indicators are used to evaluate your performance as a teacher? How do they differ from these? Which are better and why, or what are the pros and cons of each?
3. How could you use the complementary ISTE standards for teachers and for computer science educators to encourage greater computational thinking?