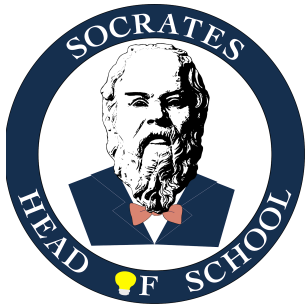# *Range* by David Epstein

Think you might want to read this book?
David Epstein uses *Range* to convince the reader that it may in fact be the generalists who add more value as the world becomes more and more complex. His basic premise is that for complex problem-solving and decision-making, it is often those with broad experience and diverse backgrounds who fare better (e.g., professionals with hobbies outside of their profession). He also incorporates business case studies and the decision to launch the Challenger Space Shuttle to emphasize how more generalized thinking benefits organizations (including how the NASA mantra "In God We Trust. All Others Must Bring Data." contributed to disaster and why having a heart attack when the top cardiologists are out-of-town may be a good thing). A great counterpoint for anyone living in the 10,000 hours to mastery philosophy and anyone who loves connections that at first blush may seem incongruent.

What would Socrates ask?
- What if we encouraged all students to go in depth in at least two areas of study?
- What if all faculty were encouraged to teach in two different departments?
- What if we challenged students to make connections between seemingly disparate ideas?
- What if as part of learning math we asked students to generate the problems from the world around them?
- What if teacher training included deep work in at least one non-education discipline?

Research
- As psychologist Ellen Winner, one of the foremost authorities on gifted children, noted, no savant has ever been known to become a "Big-C creator," who changed their field.
- The main conclusion of work that took years of studying scientists and engineers, all of whom were regarded by peers as true technical experts, was that those who did not make a creative contribution to their field lacked aesthetic interests outside their narrow area.
- Words that represent concepts that were previously the domain of scholars became widely understood in a few generations. The word "percent" was almost absent from books in 1900. By 2000 it appeared about once every five thousand words.
- ...the professors who caused short-term struggle but long-term gains were facilitating "deep learning" by making connections. They "broaden the curriculum and produce students with a deeper understanding of the material."
- ...the most effective leaders and organizations had range; they were, in effect, paradoxical. They could be demanding and nurturing, orderly and entrepreneurial, even hierarchical and individualistic all at once. A level of ambiguity, it seemed, was not harmful. In decision making, it can broaden an organization's toolbox in a way that is uniquely valuable.
- A trio of psychology and management professors who analyzed a century of Himalayan mountain climbers - 5,194 expedition groups in all - found that teams from countries that

strongly valued hierarchical culture got more climbers to the summit, but also had more climbers die along the way.

- …work that builds bridges between disparate pieces of knowledge is less likely to be funded, less likely to appear in famous journals, more likely to be ignored upon publication, and then more likely in the long run to be a smash hit in the library of human knowledge.

Concepts
- Moravec's Paradox: machines and humans frequently have opposite strengths and weaknesses.
- "The Flynn Effect" the increase in correct IQ test answers with each new generation in the twentieth century.
- End of history illusion: From tenagers to senior citizens, we recognize that our desires and motivations sure changed a lot in the past (see: your old hairstyle), but believe they will not change much in the future.
- Outside-in thinking: finding solutions in experiences far outside of focused training for the problem itself.
- Einstellung Effect: psychology term for the tendency of problem solvers to employ only familiar methods even if better ones are available.
- Lateral thinking: a term coined in the 1960s for the reimagining of information in new contexts, including the drawing together of seemingly disparate concepts or domains that can give old ideas new uses.
- Polymath: a person with a broad understanding of a lot of subjects and at least one area with significant depth.

Quotes from the author
- Some outstanding musicians have focused very young. The supreme cellist Yo-Yo Ma is a well-known example. Less well known, though, is that Ma started on violin, moved to piano, and then to the cello because he didn't really like the first two instruments.
- Good performance on a test during the learning process can indicate mastery, but learners and teachers need to be aware that such performance will often index, instead, fast but fleeting progress.
- There was also a "perverse inverse relationship" between fame and accuracy. The more likely an expert was to have his or her predictions featured on op-ed pages and television, the more likely they were always wrong.
- A team or organization that is both reliable and flexible, according to Weick, is like a jazz group. There are fundamentals-scales and chords-that every member must overlearn, but those are just tools for sensemaking in a dynamic environment. There are no tools that cannot be dropped, reimagined, or repurposed in order to navigate an unfamiliar challenge.

Quotes from others
- "No historian who takes in the sweep of human history on the scale of centuries could miss the fact that we are now living in a period of extraordinary brainpower." - Harvard psychologist Steven Pinker
- "Big innovation most often happens when an outsider who may be far away from the surface of the problem reframes the problem in a way that unlocks the solution." - Karim Lakhani, co-director of the Laboratory for Innovation Science at Harvard

- "If you're working on well-defined and well-understood problems, specialists work very, very well. As ambiguity and uncertainty increases, which is the norm with systems problems, breadth becomes increasingly important." - Andy Ouderkirk
- "Take your skills to a place that's not doing the same sort of thing. Take your skills and apply them to a new problem, or take your problem and try completely new skills." - Oliver Smithies, professor at the University of North Carolina

Implement tomorrow?
- The Alternative Uses Test

Organizations/schools working on answers
- InnoCentive
- Intelligence Advanced Research Projects Activity

Gateways to further learning
- Fermi problems

Referenced books with the potential to impact leading and learning in education

Author(s) Last Name	Title
Syed	*Bounce*
Sloboda	*The Musical Mind*
Dewey	*Logic, The Theory of Inquiry*
Konnikova	*The Confidence Game*
Griffin	*Serial Innovators*
Ehrlich	*The Population Bomb*
Tetlock	*Superforecasting*
Vaughan	*The Challenger Launch Decision*

The applicability of this book to education is ….

Abstract ←———✕—————————→ Obvious