

## **STEM Thinking and the Law in Your Gifted Classroom**

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Yes, technology most certainly affects the legal sector of our society, and legal concerns can also influence the design of new products and services. Your gifted students should explore this interaction.

First of all, the legal profession can and does make use of technology to perform their function. Lawyers use computer technology to type their legal paperwork and access office files to review their notes and strategies. Laptops are often seen in the courtroom, being used by attorneys, recording secretaries or court reporters.

Patent attorneys routinely use the Internet to conduct searches of past and possibly similar inventions to make sure their clients' work is not infringing on that of others. New legislation established by governing bodies can be drafted quicker via computer terminals and circulated among committee members for review and comment – all making the legislative process that much faster and smoother.

Legal professionals also utilize the services of professionals in the various technological fields – so called expert witnesses – to explain how evidence was gathered, preserved and analyzed. Here technology is shown as a process, and compared to readily acceptable practices and procedures that govern the field in question during a trial. Often, expert witnesses will be asked to explain, in great detail, the actions taken and procedures followed.

Detailed technical discussions (i.e., lie detectors, DNA testing, ballistics, fingerprinting...etc.) are also very much used in typical court cases. Other related technologies and evaluation techniques involving the impact of new products on people who have been, or claim to have been, injured through use of such products is also in common use. Expert testimony usually takes up the bulk of such cases and many experts may be called to testify by both prosecuting and defense attorneys.

### **Tech Education, the Law, and STEM**

So what does this mean to technology education and STEM in the classroom?

It means another design constraint to deal with when solving problems. How will your solution to a problem possibly impact or be impacted by legal concerns? Have you used safe materials and procedures in the design, manufacture, and implementation of the new products or services you are offering? How might someone claim your product or service has injured them? Is there something obvious that has been possibly overlooked? What sort of laws or regulations may impact your work, both now and in the future?

One very valuable way to anticipate such legal impacts is to have gifted students engage in role-playing. Several can take the pro position of a proposed solution to a problem, while an equal number can take the con position; and then both sides can debate the merits of the technology used in the solution.

Some students can play the role of expert witnesses and be used by the pro and con groups in mock trials to see how discussions about the topic can be influenced by debate. You might consider bringing in professionals from the business and technical communities to also participate in these discussions and offer expert testimony and advice. Other teachers could serve as a jury for the mock trial.

### **Patents and the Law**

Legal costs and defending things like patents, trademarks, and copyrights are a significant cost for companies that develop and implement new products and services. A typical patent can cost \$10,000-\$30,000 alone to obtain, without the potential court costs to defend it against infringement. Such legal costs can run into the millions, if the patent is highly valuable and a foundation for a new industry, or a series of revolutionary products. This is especially true of pharmaceutical companies and drug patents, which can easily run into the hundreds of millions of dollars – like pollution claims and claims for cigarette caused deaths or cancers.

Also, legal challenges on the safety of such products and the interpretation of who, and what, has been harmed, can also easily run into the millions of dollars. Such court costs have bankrupted well-meaning companies, and squelched new products before they had a chance to get fully accepted.

I was once called to court to testify about two of my patents. I sold them to another manufacturing and service firm that was using the technology in their business. This manufacturer was then being infringed by another manufacturer, who claimed their work superceded

ours; therefore, our patents were invalid. Ultimately, I endured 6 hours of in-depth questioning that ultimately proved I had certainly done work prior to what the infringing manufacturer was claiming was his, and in doing this, proved that my work superceded his. We won the court case, but it cost the manufacturer I was representing over \$1 million dollars in legal fees.

## Law in the Gifted Classroom

The legal system is not something to be taken lightly when evaluating technological solutions to complex problems. Gifted students need to be aware of such impacts, and the consequences. Help them learn about how the legalities of the business world impacts problem solving. How about these activities for your gifted students?

- 1) Bring some lawyers into class to discuss what you and the class are learning and doing. See the technology picture from another perspective. Perhaps a panel discussion with lawyers present can best serve this learning exercise. Perhaps some school alumni who are lawyers can be invited back to the school for this activity.
- 2) Identify and examine key past legal cases that were especially pertinent to the technology-law interaction. What were the major findings and how did this impact future design considerations for new technology, products, and services?
- 3) Examine the possible legal costs and ramifications for implementing electric vehicles on a wide scale basis – looking at such major topics as: -Accidents and the breakage of batteries and spilling of battery liquids -Charging the vehicle's batteries in one's garage -Manufacturing the many batteries that will be needed, and their ultimate disposal.
- 4) Examine how the use of laboratory equipment and school labs themselves impact the insurance costs for the school. How about students traveling to field trips on buses? Or for athletes who play sports for the school?
- 5) Consider a new technology that allows people to conduct medical tests at home and transmit their data to their doctor – perhaps through some sort of blood tester or scanning device. What might be the legal implications of such a device?

**Excellent eBook of Great Poetry – *Immortal Poets* (2011, The Seashell Press, Kindle Edition) – [Available on Amazon.com](#)**

Christopher Burns has produced an inspiring poetry collection in a portable and personal eBook format. By including background information about each poet's motivation and development, he offers the reader new insights concerning poetic creativity.

The poems are organized according to significant periods in the history of poetry from the Pre-Elizabethans to the Modernists. The Introduction is well-written and informative – it discusses how the book is organized, why the study of each poet's background leads to a better understanding of their poetry, and presents three characteristics of great poets. Burns analyzes some important environmental factors in the development of the immortal poets. In addition, he has a fascinating discussion of certain indicators related to early giftedness (e.g., excitabilities) that might be precursors to the poetic imagination.

This is an extensive collection of hundreds of well-selected English, Irish and American poems from Beowulf c. 750 AD) to High Flight (1941) by John G. Magee. The author gives a brief biography of each poet, highlighting family histories and motivations, before presenting their poems. Examples of poems and poets that would be of particular interest to gifted students are: ***Pre-Elizabethans (England pre-16th century)*** – Beowulf, Canterbury Tales (Chaucer); ***Elizabethans*** – The Nymph's Reply to the Shepherd (Sir Walter Raleigh); Shall I Compare Thee to a Summer's Day, When to the Sessions of Sweet Silent Thought, All the World's a Stage (William Shakespeare); ***Metaphysicals*** – No Man is an Island (John Donne); On His blindness (Milton); ***Romantics (England 19th century)*** – The Tiger (Blake), Lines Composed a Few Miles Above Tintern Abbey, Ode on Intimations of Immortality (Wordsworth), The Rime of the Ancient Mariner (Coleridge); Ode on a Grecian Urn (Keats); ***Victorians*** – Charge of the Light Brigade, The Eagle (Tennyson), Dover Beach (Arnold), Echo (C. Rossetti), Afterwards (Hardy), Gunga Din, If – (Kipling); ***New England Poets (America 19th century)*** – Concord Hymn (Emerson), Paul Revere's Ride, The Jewish Cemetery at Newport (Longfellow), Telling the Bees (Whittier); Conscience (Thoreau); ***American Romantics (America 19th century)*** – I Hear America Singing, Oh Captain! My Captain! (Whitman), A narrow fellow in the grass, Hope is a thing with feathers, I died for beauty, I dwell in possibility (Dickinson), Annabel Lee, The Raven (Poe), The Cremation of Sam McGee (Service), General William Booth Enters Into Heaven (Lindsay); ***War Poets (England early 20th century)*** – Anthem for Doomed Youth (Owen), Counter-Attack (Sassoon); ***Irish Renaissance (Ireland 20th century)*** – The Lake Isle of Innisfree (Yeats), I Hear an Army (Joyce); ***Harlem Renaissance (America 20th century)*** – Dream Deferred, I, Too, Sing America, The Weary Blues (Hughes), Song In Spite of Myself (Cullen), Sonnet to a Negro in Harlem (H. Johnson); ***Imagists*** – Chicago (Sandburg), Stopping by Woods on a Snowy Evening (Frost), Night Clouds (A. Lowell), Love is not all (St. Vincent Millay); ***Modernists (England/America 20th century)*** – The Waste Land (Eliot), The Red Wheelbarrow, The Widow's Lament in Springtime (Williams), The Emperor of Ice Cream (Stevens), O sweet spontaneous (Cummings). Carry this eBook around with you. Read it for insights and inspiration. You can't go wrong by purchasing ***Immortal Poets!***