Textbooks Unbound

The Promise (and Perils) of the Digital Textbook Revolution

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Mark Springer
The Part Where I Tell You What I’m Going to Tell You

- Introduction
- The Paradox
- Textbooks c. 2012
- Promise & Peril

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An Elegant Solution to a Zombie Outbreak
The Paradox
4.3 Eukaryotic Cells

Learning Outcomes
1. Compare the organization of eukaryotic and prokaryotic cells.
2. Discuss the role of the nucleus in eukaryotic cells.
3. Describe the role of ribosomes in protein synthesis.

Eukaryotic cells (figures 4.6 and 4.7) are far more complex than prokaryotic cells. The hallmark of the eukaryotic cell is compartmentalization. This is achieved through a combination of an extensive endomembrane system that weaves through the cell interior and by numerous organelles. These organelles include membrane-bounded structures that form compartments within which multiple biochemical processes can proceed simultaneously and independently.

Plant cells often have a large, membrane-bounded sac called a central vacuole, which stores proteins, pigments, and waste materials. Both plant and animal cells contain vesicles—smaller sacs that store and transport a variety of materials. Inside the nucleus, the DNA is wound tightly around proteins and packaged into compact...
Students: PDF replicas are “clumsy.”
SOME ROLLING PINS ARE LESS EFFICIENT.
\[
\frac{\partial u_r}{\partial t} + u_r \frac{\partial u_r}{\partial r} + \frac{v_\phi}{r} \frac{\partial u_r}{\partial \phi} - \frac{v_\phi^2}{r} = -\frac{\partial}{\partial r} (h + \Psi + \Psi_*) , \tag{1}
\]
\[
\frac{\partial v_\phi}{\partial t} + u_r \frac{\partial v_\phi}{\partial r} + \frac{v_\phi}{r} \frac{\partial v_\phi}{\partial \phi} + \frac{v_\phi u_r}{r} = -\frac{1}{r} \frac{\partial}{\partial \phi} (h + \Psi + \Psi_*) , \tag{2}
\]
\[
\frac{\partial \sigma}{\partial t} + \frac{1}{r} \frac{\partial}{\partial r} (r \sigma u_r) + \frac{1}{r} \frac{\partial}{\partial \phi} (\sigma v_\phi) = 0 , \tag{3}
\]
\[
\Psi(r, \phi) = -G \int_{R_{in}}^{R_D} \int_{R_{in}}^r \sigma(r') r' \, dr' \times \int_0^{2\pi} \frac{d\phi'}{\sqrt{r^2 + r'^2 - 2rr' \cos \phi' + \eta^2(r)}} . \tag{4}
\]
The Equation

• Entrenched big-name players
  +
• Unmet consumer needs
  +
• Rapidly evolving technology
  +
• $20\text{-}billion\ global\ market = ??
VC
The new superhero of the modern world.
Venture-Capital Investment in Education-Technology Companies

Note: Data include educational-technology companies in elementary and secondary education, higher education, lifelong learning, and informal education.

Source: National Venture Capital Association, thomson Reuters
Promise & Peril
\[ \int_{a}^{b} f(x) \, dx = F(b) - F(a) \]
INTEGRATE ALL THE FUNCTIONS!