computational education

Alan Kay cultural ideas

universals
- language
- communication
- fantasies
- stories
- tools and art
- superstition
- religion and magic
- play and games
- differences over similarities
- quick reactions to patterns
- vendetta and more

non-universals
- reading and writing
- deductive abstract mathematics
- model based science
- equal rights
- democracy
- perspective drawing
- theory of harmony
- similarities over differences
- slow deep thinking
- agriculture
- legal systems

since 17th century
- arguments, not narratives, which defy liniar representation
- examples
  - chaos theory
  - complex systems
  - simulation modeling
- vanishingly few are fluent in these forms of communicatio

obstacles to adoption
- current standards and testing
- misunderstood history
- schools of education
- sate-by-state standards prevent national comparison or adoption
- IT support severely under funded
- applications-centered technology instruction

tools
- etoys
- scratch
- agentsheets
- kodu
- Alice3D
- ClickTeam
- GameMaker
- Project Fun Editor (DigiPen)
- MCW Logo
- LEGO robotics
- mathematica
- wolfram alpha
- Sketchup
- common lisp
- OpenGL
- DrScheme
- git, mercurial
- github, bitbucket
- wiki

big ideas
- automation
- collaboration
- emergence
- group vs. individual
- scale
- game theory (non-zero sumness)
- programming languages fuse math and language
- historical lessons from the printing press
- reflection, recursion, self-reference, macros, fractals
- economics of knowledge, especially of code
- ethics
- human-centered design
- coupling
- logo
- messaging
- ephemeralization

specific business ideas
- consultancy
- crft.us (computational resources for teaching
- edupunk franchise

specific project ideas
- flying turtles (or sea turtles?
- X System lessons in telecommunications and secrecy
- conic sections
- distributed version control
- html as preferred document format
- collaborative asset mapping
- volunteer hours tracking
- cybercorp
- executable documentation
- compile student projects to iphone or android apps

lesson or workshop ideas
- growth of polygons
- drive a car, position, velocity, accelleration
- galileo's experiments with gravity - understanding and modeling
- leonardo's experiments with perspectival windows
- von Koch snowflake, don't repeat yourself, fractals, significant digit
- simulate flocks, schools, herds, and hives
- simulate prisoner's dilemma -- add communication and trust
- build your own 3d printer