

Mind the Metaphor:
**Charting the Rhetoric about Introductory
Programming in U.S. K-12 Schools**

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International Conference
The Future of Education
Edition 6

Overview



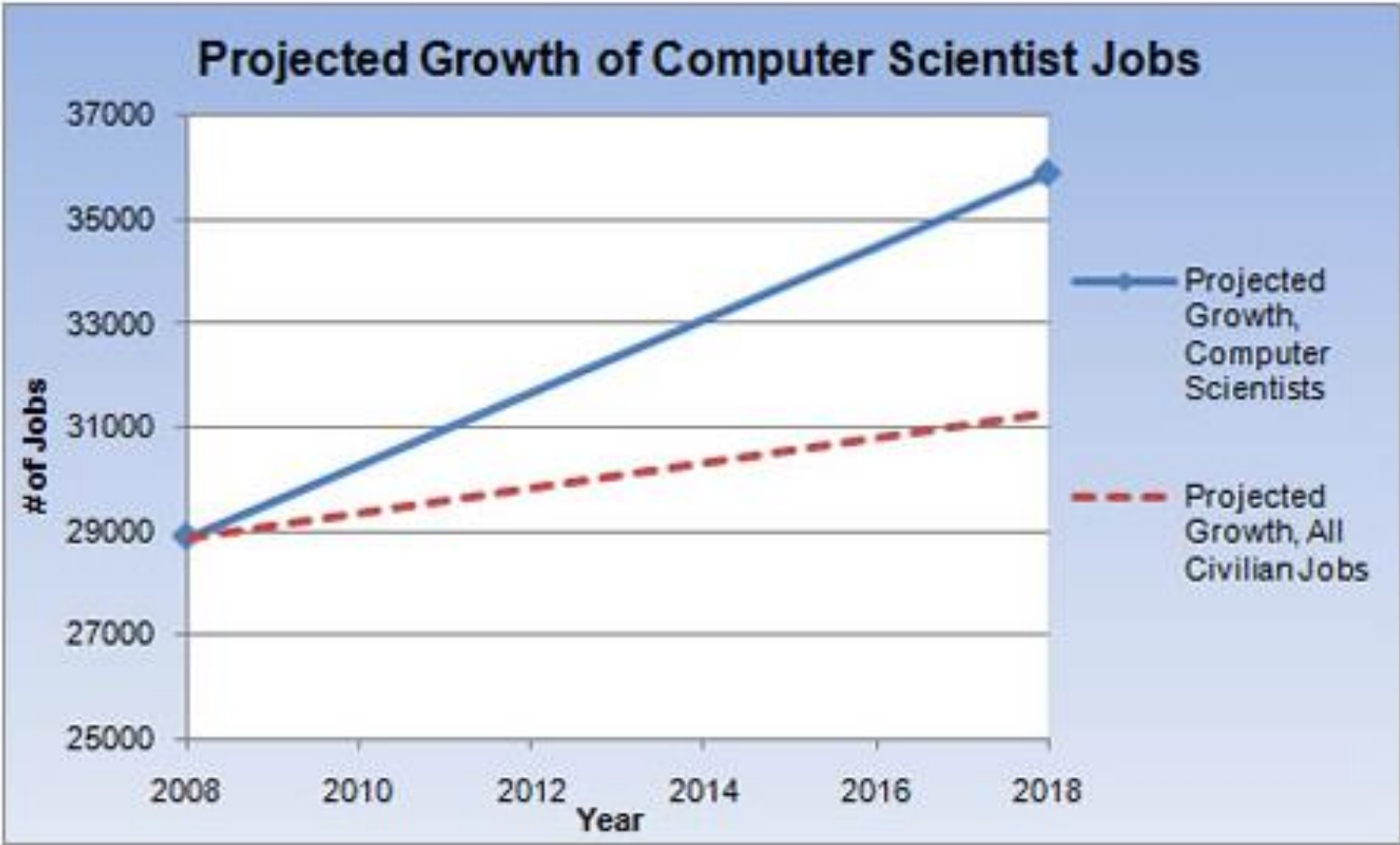
- **Why coding?**
- **Why metaphor?**
- **What are the prevalent metaphors?**
- **Why all this matters & what needs to happen**

Why coding?



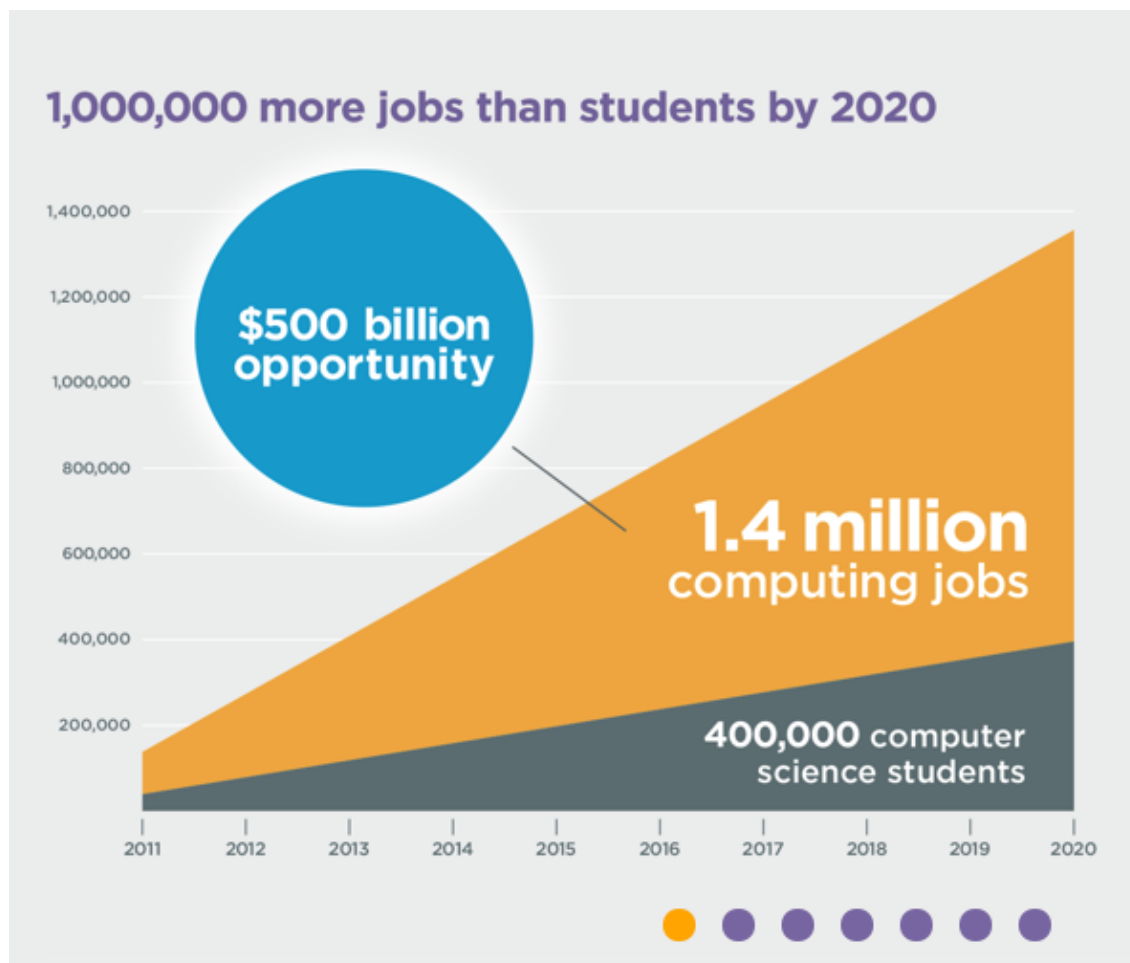
Reason #1

Economic Factors: *Jobs!*



(Bureau of Labor Statistics, 2015)

No One for these *Jobs!*



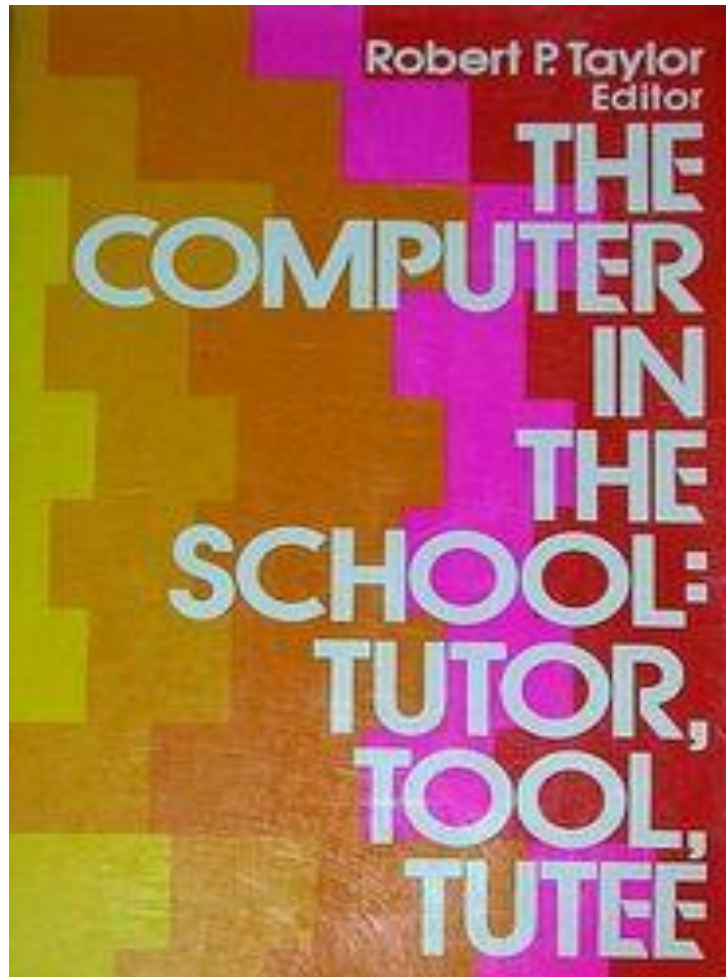
(Code.org)

Reason #2

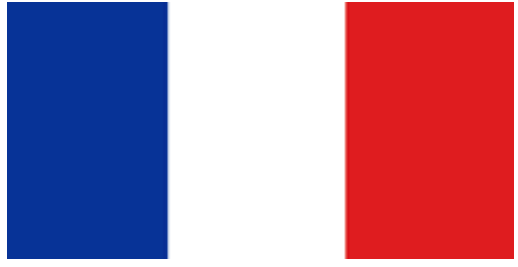
The Myth of Digital Natives



(Prensky, 2001)



Many countries have mandated coding in K-12 schools



So why metaphor?



Coding is hard to learn (& hard to effectively teach)

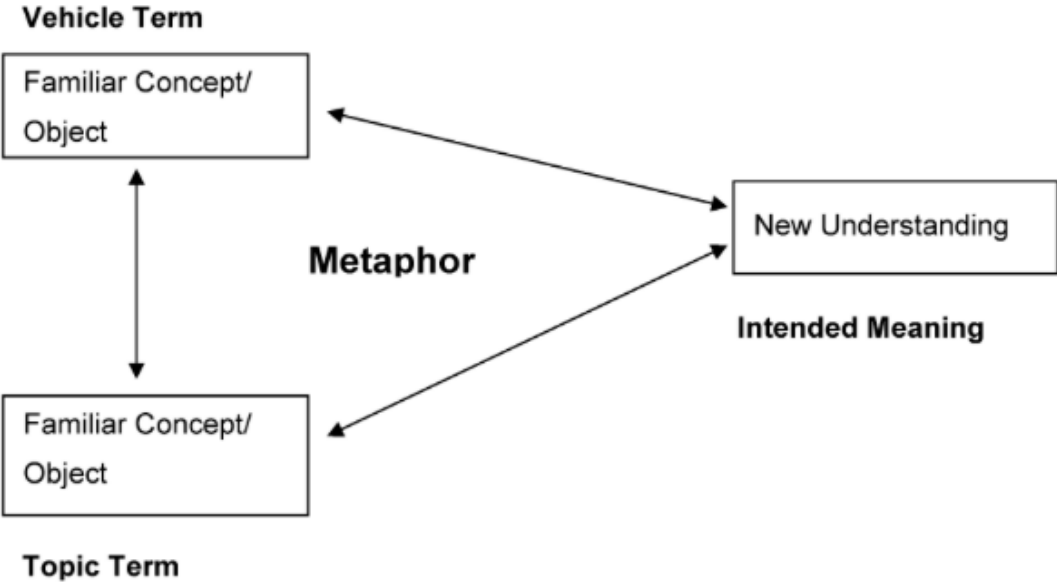
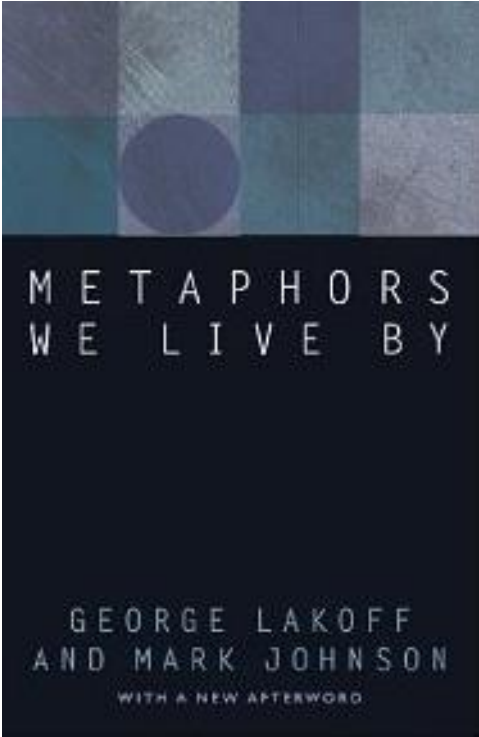
(Mayer, 1981; Robins, Rountree, & Rountree, 2003)

**But getting people to try coding
is perhaps the hardest part**

DuBoulay (1989)

Lakoff & Johnson (1980)

metaphor = generative



Getting the right metaphor is important, but so is knowing the limitations of our metaphors. An imperfect metaphor can mislead as much as an apt metaphor can illuminate”

- Hal Abelson, Blown to Bits (p.4)



So what are the metaphors?

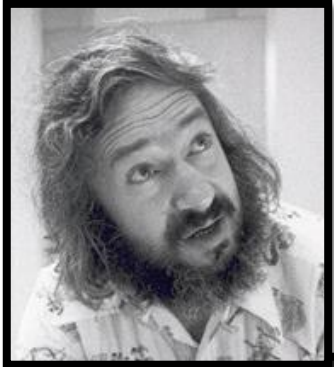
method

Analysis of 67 peer-reviewed books and journal articles as well as news articles and editorials related to students' learning (or needing to learn) computer programming on the K-12 level.

Academic or popular, each article was analyzed in terms of

- (a) the figurative language it employs
 - (b) the association(s) it make(s) with pre-existing school subjects
 - (c) the intended audience of the publication, whether purported or stated outright
-

metaphor #1 = grounded math



“In this book, the *Mathland metaphor* will be used to question deeply engrained assumptions about human abilities.”

- Seymour Papert, *Mindstorms*, 1980

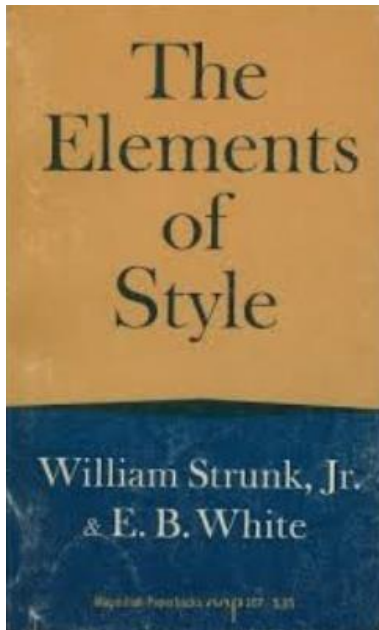
Academic

Abelson & diSessa, 1980; Schanzer et al., 2015; Wright, Rich, & Lee, 2013; Soloway et al., Wilensky, 1995

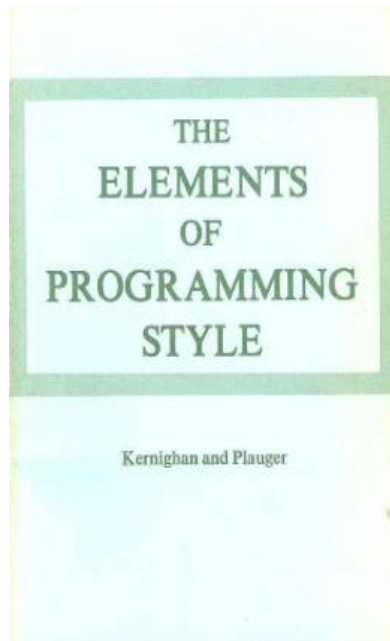
Popular

Burt, 2014; Garofoli, 2015; Weissman, 2014

metaphor #2 = new literacy



Strunk & White,
1959



Kernighan &
Plauger,
1974

“For us, coding is not a set of technical skills but a new type of literacy and personal expression, valuable for everyone, much like learning to write. We see coding as a new way for people to organize, express, and share their ideas.”

- Mitchel Resnick (w/ D. Siegel), 2015

Academic

Bogost, 2007; diSessa, 2010; Knuth, 1960; Vee, 2013

Popular

Harel, 2014; Morais, 2016; Rushkoff, 2010

metaphor #3 = technical skill

MAKER SPACE



“We are creatures that need to make...”

- Dale Dougherty, 2013

Academic

Gardiner, 2014; Larson, 2013; Wagstaff, 2012

Popular

Dougherty, 2013; Meek, 2012; Morgan, 2016;
Quinton, 2010

So what?

Question of a pathway....



Who will teach is priority #1



***How* students best learn is priority #2**

For or Against Coding... metaphor is inevitable

"I would no more urge everyone to learn programming than I would urge everyone to learn plumbing."

- Jeff Atwood (2012)
Blog Coding Horror



Questions?

Copy of the paper?

Contact Me

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