Educating Practicing Teachers into Constructivist Pedagogy

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TAKE A BREAK


DILBERT
PREPARE A PRESENTATION FOR OUR FOREIGN VISITORS.
ON WHAT TOPIC?
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IT DOESN'T MATTER. I'M TOLD THEY'RE FROM AUSTRIA AND THEY ONLY UNDERSTAND THEIR OWN LANGUAGE.
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3/3/98
OR WAS IT AUSTRALIA?

Model of Instructional Reform I:
Emphasize Teaching for Understanding

- Focus on challenging objectives...
- And equally challenging tasks…
  - Students articulate reasoning (e.g., writing)
  - Revise their work
  - Peer discourse and group decision-making
  - Meta-cognition
- Made feasible by...
  - Resources: information, “thinking tools,” communication
  - Reorganizing classroom structures and roles
    - Model the learning process
    - Student responsibility and freedom
  - Meaningful tasks
- Assessment consistent with learning goals

Model of Instructional Reform II

Make Meaningfulness The Primary Attribute of Tasks

- Contextually rich learning tasks
  - Projects
  - Real world applications
  - Authenticity
  - Depth
  - Skill learning embedded
- Take students' thinking and feeling into account
  - Students' prior beliefs
  - Student interest -> tasks
  - Student choice in tasks and methods
- Reorganize classroom structures and roles
  - Cooperative work groups
  - Students given leadership roles
  - Student initiative facilitated

Workshops at NECC, 1998

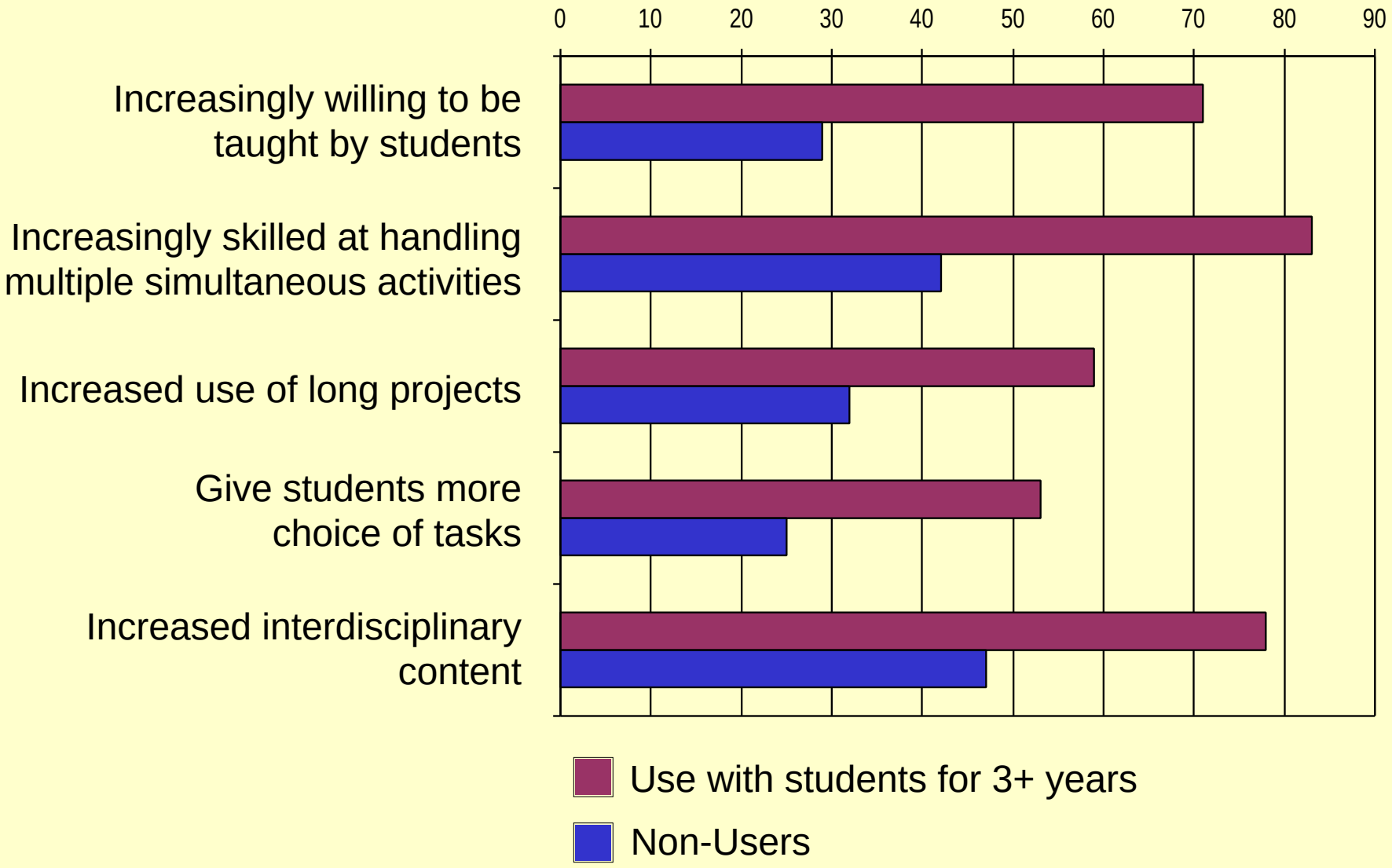
- Effective Student Research Strategies on the Web
- Using Interactive Technologies for Collaborative Learning
- Generation WHY
- Cocoa World: Create with an Authoring Tool
- Digital Cameras in the Classroom
- Desktop Publishing in Science and Social Studies
- Transforming Elementary Activities into Constructivist Ones with Technology
- Geometry: A Feast for the Senses

Possible Relationships Between Constructivist Teaching and Computer Use

- Teachers' Philosophy Determines How they Use Computers
- Teachers' Use of Computers Affects Teaching Practice —Even When Not Using Computers
- Teachers' Use of Computers Changes Teaching Philosophy
- These associations are all happenstance:
  - innovative teachers use computers and innovative teachers are constructivists.

Computer-using teachers reported more changes in their teaching practice in the past 3 years than non-users

National School Network survey, Spring, 1997



Teaching, Learning, and Computing 1998

Hank Becker, University of California, Irvine
Ron Anderson, University of Minnesota

Http://www.crito.uci.edu/TLC

Teaching, Learning, & Computing--1998

- A representative sample of all U.S. teachers in grades 4-12 (Probability Sample)
- A sample of teachers from schools in major reform projects and schools with high-end technology (Purposive Sample)
- Over 4,100 teachers in 1,100 schools participated, nearly 70% of those sampled
- Completed 20 page questionnaires
- Also, data from principals and school technology coordinators in the same schools

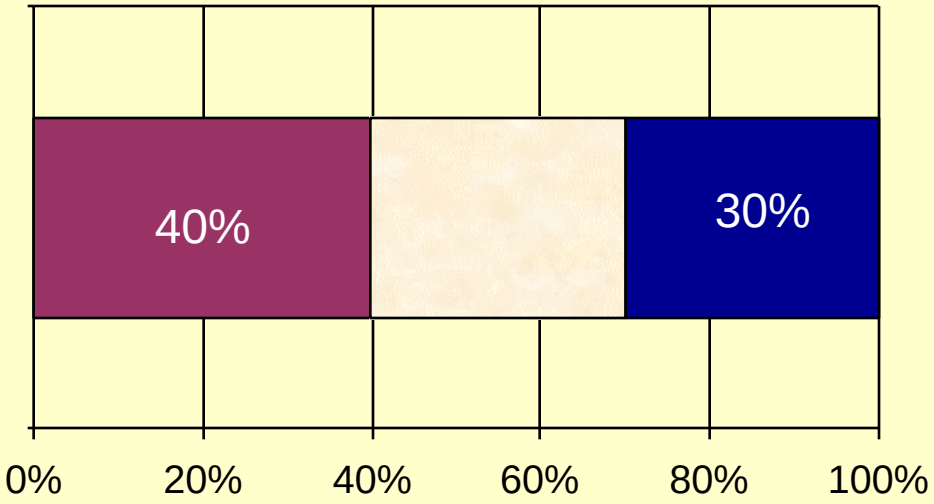
Possible Correlates of Constructivist Philosophy and Practice

- Computer experience
- Teaching responsibilities and experience
- Educational background
- School support for teachers' technology use and constructivist practice

Teacher as a Facilitator Versus Structured Explanation

Facilitator

"I try to provide opportunities and resources for my students to discover or construct concepts for themselves."



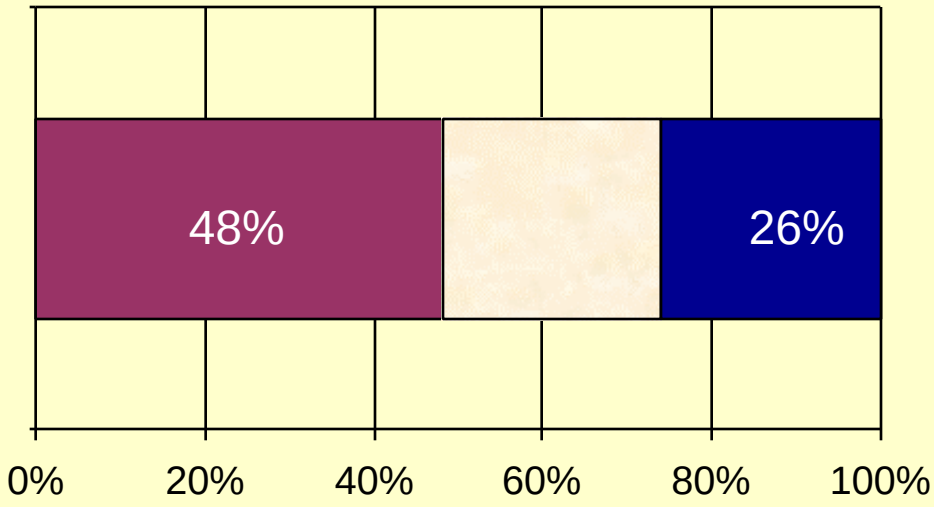
Explanation

"My students won't really learn the subject unless you go over the material in a structured way. It's my job to explain, to show students how to do the work and to assign specific practice."

Variety of Activities Versus Same for All

Variety

"It is a good idea to have all sorts of activities going on in the classroom. Some students might produce a scene from a play they read. Others might create a miniature version of the set It's hard to get the logistics right, but the successes are so much more important than the failures."



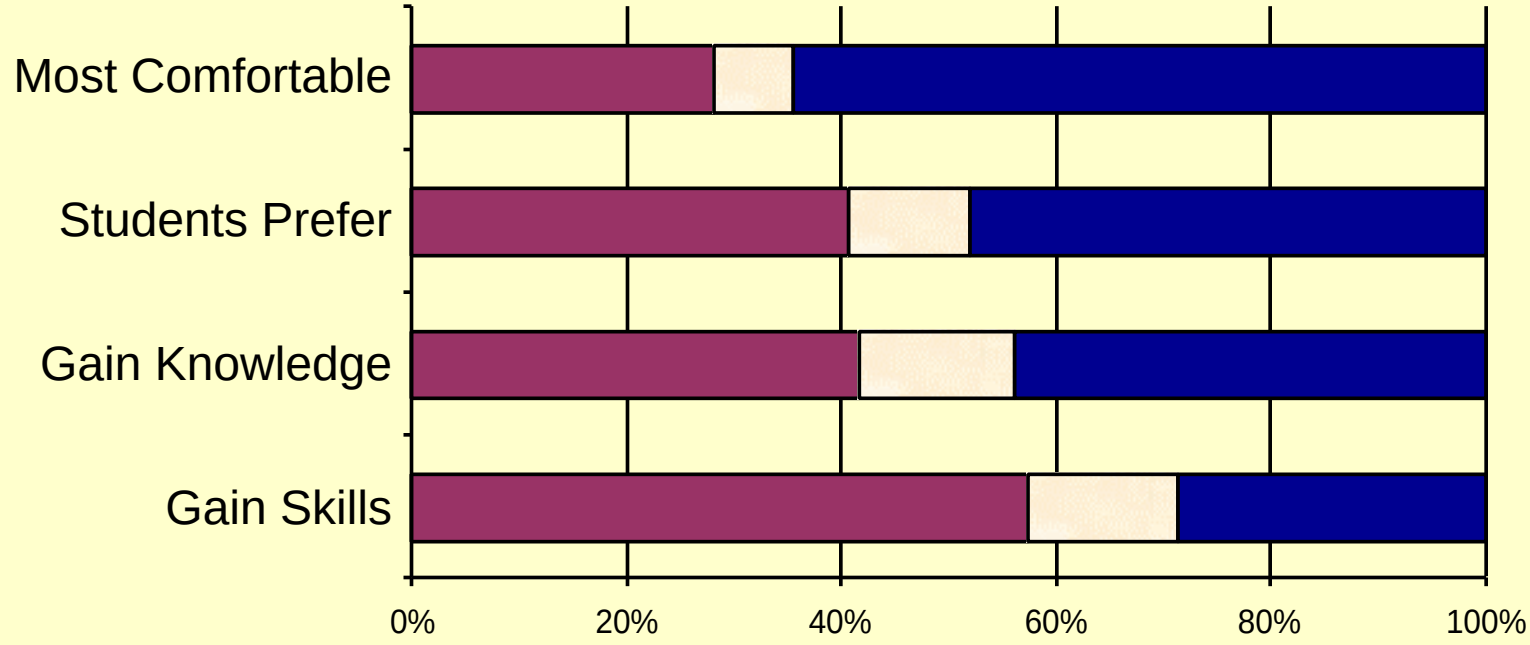
Explanation

"It's more practical to give the whole class the same assignment, on that has clear directions, and one that can be done in short intervals that match students' attention spans and the daily class schedule."

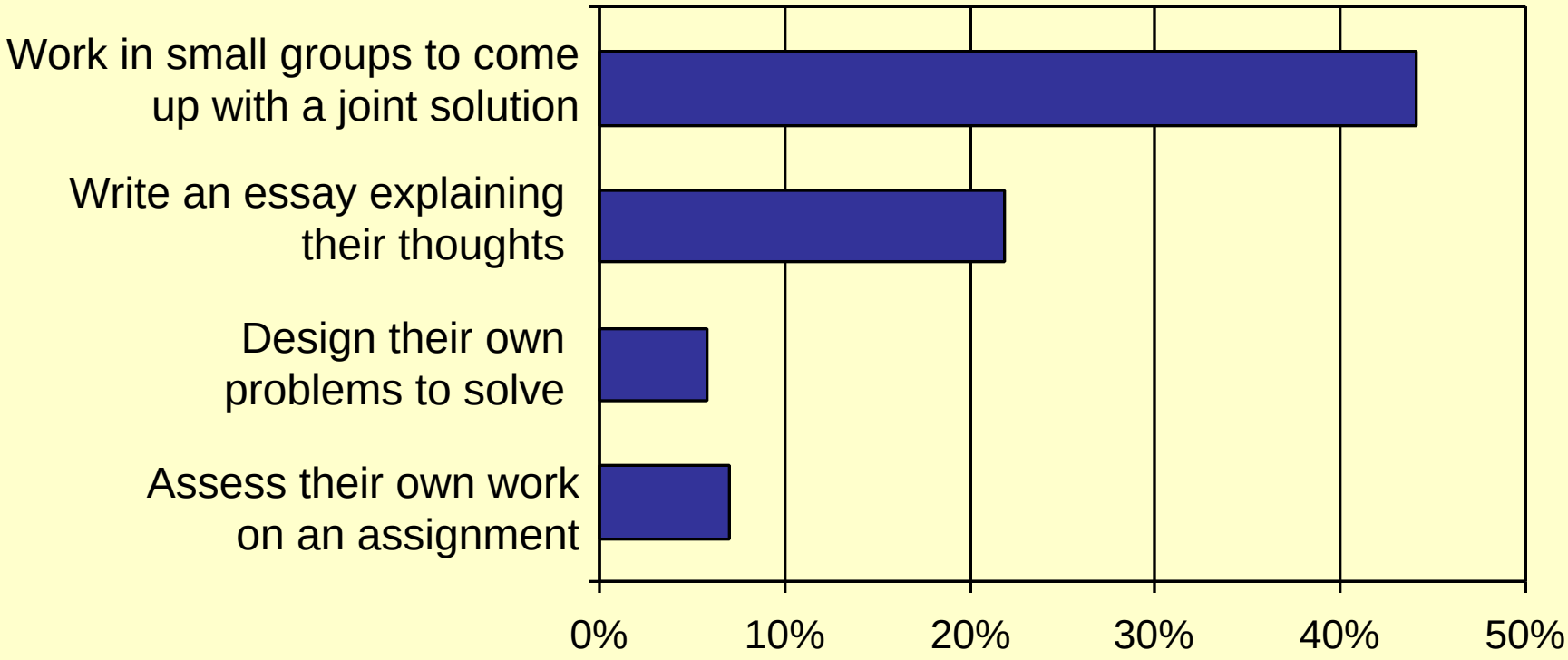
Two Teachers Compared

Mr. Jones:
Many questions came from students themselves. Though Mr. Jones could clarify questions and suggest sources of relevant information, he couldn't really answer most of the questions himself.

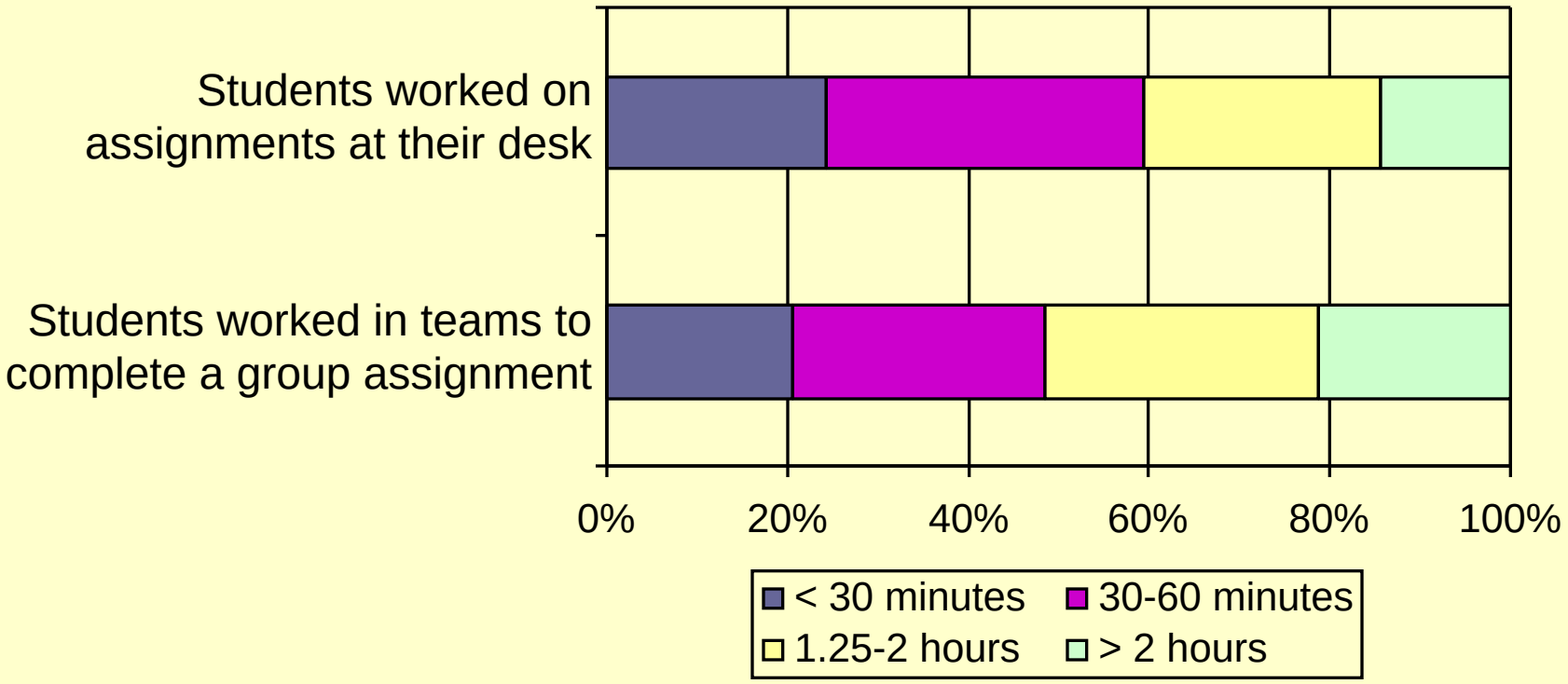
Ms. Hill:
Asked questions the students could answer quickly; based on reading they had done before. New material is taught using simple questions to keep students attentive.



Frequency of Some Knowledge Construction Activities % weekly or more often



Over the last 5 hours you taught the class….



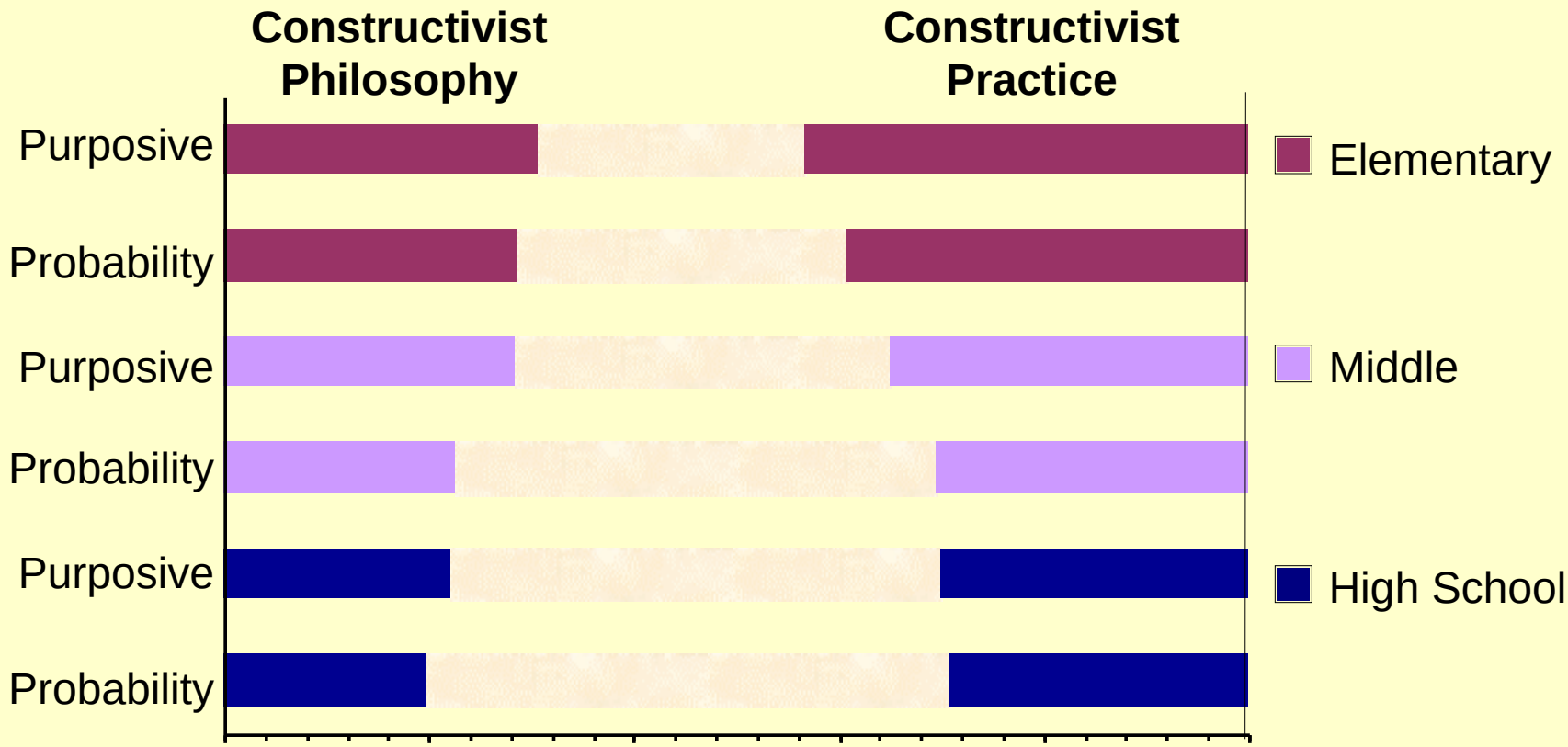
18 Indicators of Constructivist Philosophy Include Teacher's Belief That...

- Students ready for meaningful learning before acquiring basic skills
- Students should decide what activities are to be done
- Instruction should not be on problems with clear answers
- How much students learn does not depend on their background knowledge
- Teachers should act as facilitators versus explainers
- Student thinking is more important than content of the curriculum
- Interest in academic work is more important than learning skills from textbooks
- A variety of activities is better than the same assignment for all
- Short-answer and multiple-choice tests are not useful
- Open-ended problems are useful
- Individual and group projects are useful
- Student presentations/performances are useful
- Teachers don't know more than students and should not explain answers
- A quiet classroom is not needed for effective learning
- Teacher feels comfortable facilitator versus explainer
- Students gain more knowledge from teacher as facilitator versus explainer
- Students gain more useful skills from teacher as facilitator versus explainer
- Students prefer discussions with teacher as a facilitator versus explainer

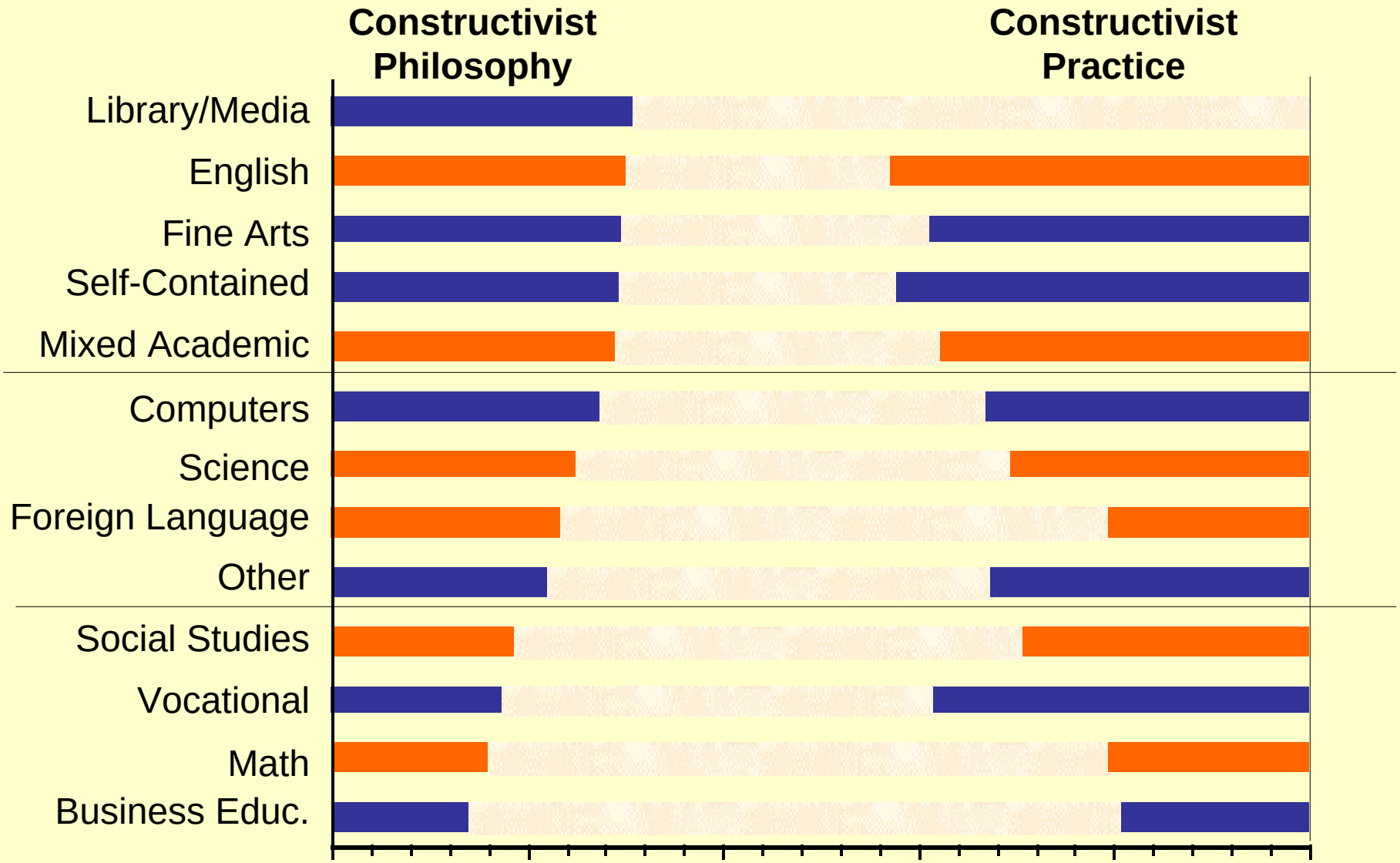
20 Indicators of Constructivist Practice include...

- Students often work individually answering questions
- Students often do hands-on/laboratory activities
- Students often work on projects that take a week or more
- Students often write in a journal
- Students often suggest or help plan classroom activities
- Students often work in small groups to come up with a solution
- Students work on problems for which there is no solution
- Students often write an essay explaining their thoughts
- Students often hold a debate and argue for a point of view
- Students often have to design their own problems to solve
- Students often decide on their own procedures for solving problems
- Students often assess their own work on an assignment
- Students often have to represent the same relationship in more than one way
- Students often make a product that will be used by someone else
- Students often demonstrate their work to an audience
- Students often have tasks for which there is no correct answer
- Teacher does not often lead a whole-class discussion
- Students often lead a discussion or give a presentation
- Students do not often work on their own on assignments at their desks
- Students often work together in small groups to complete an assignment

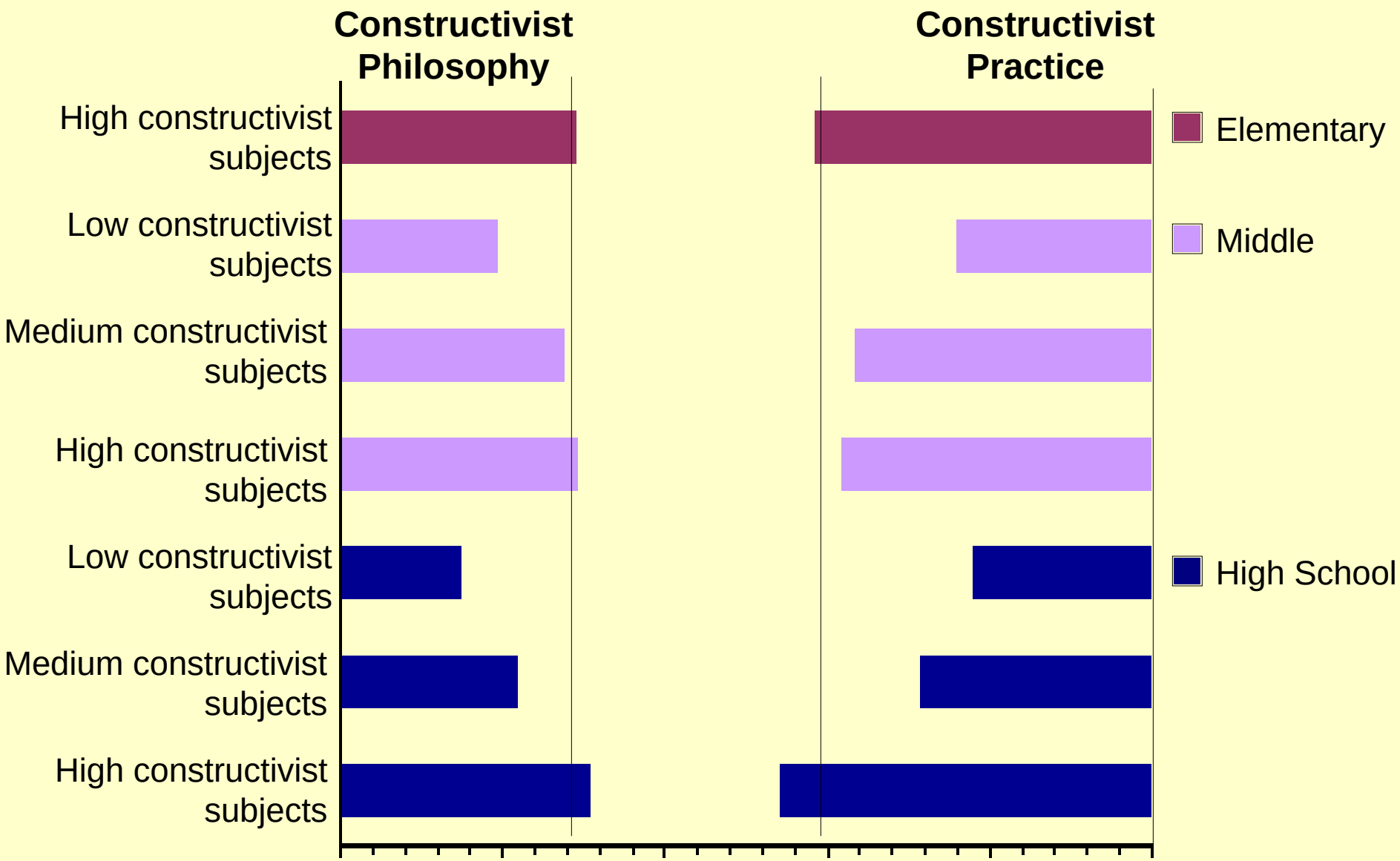
Elementary Teachers and Purposive Sample Are More Constructivist



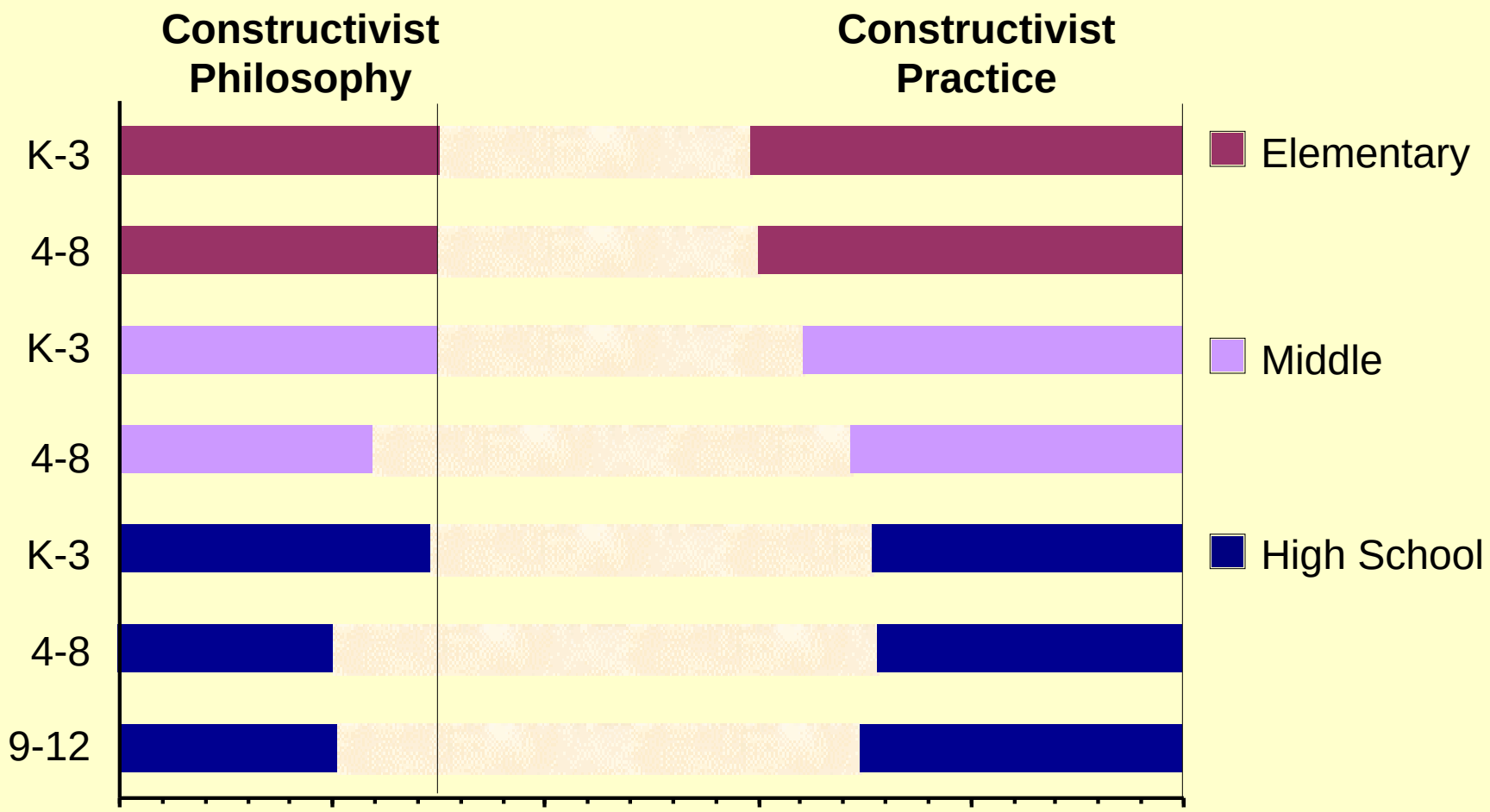
Constructivism by Subject Taught



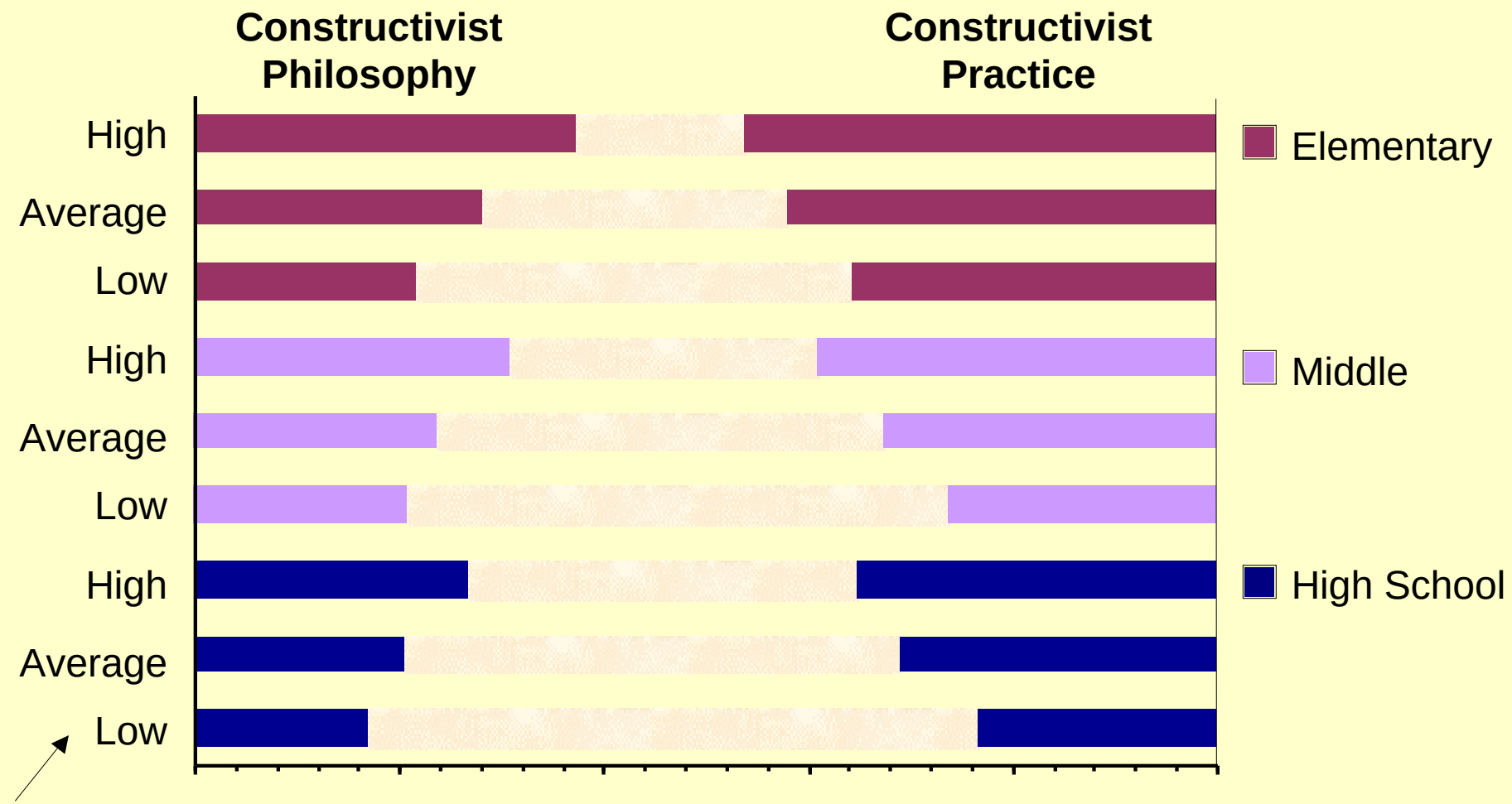
It may Not be Level but Subject Responsibilities



The Deborah Meier Theory:
Lowest Grade Level Ever Taught

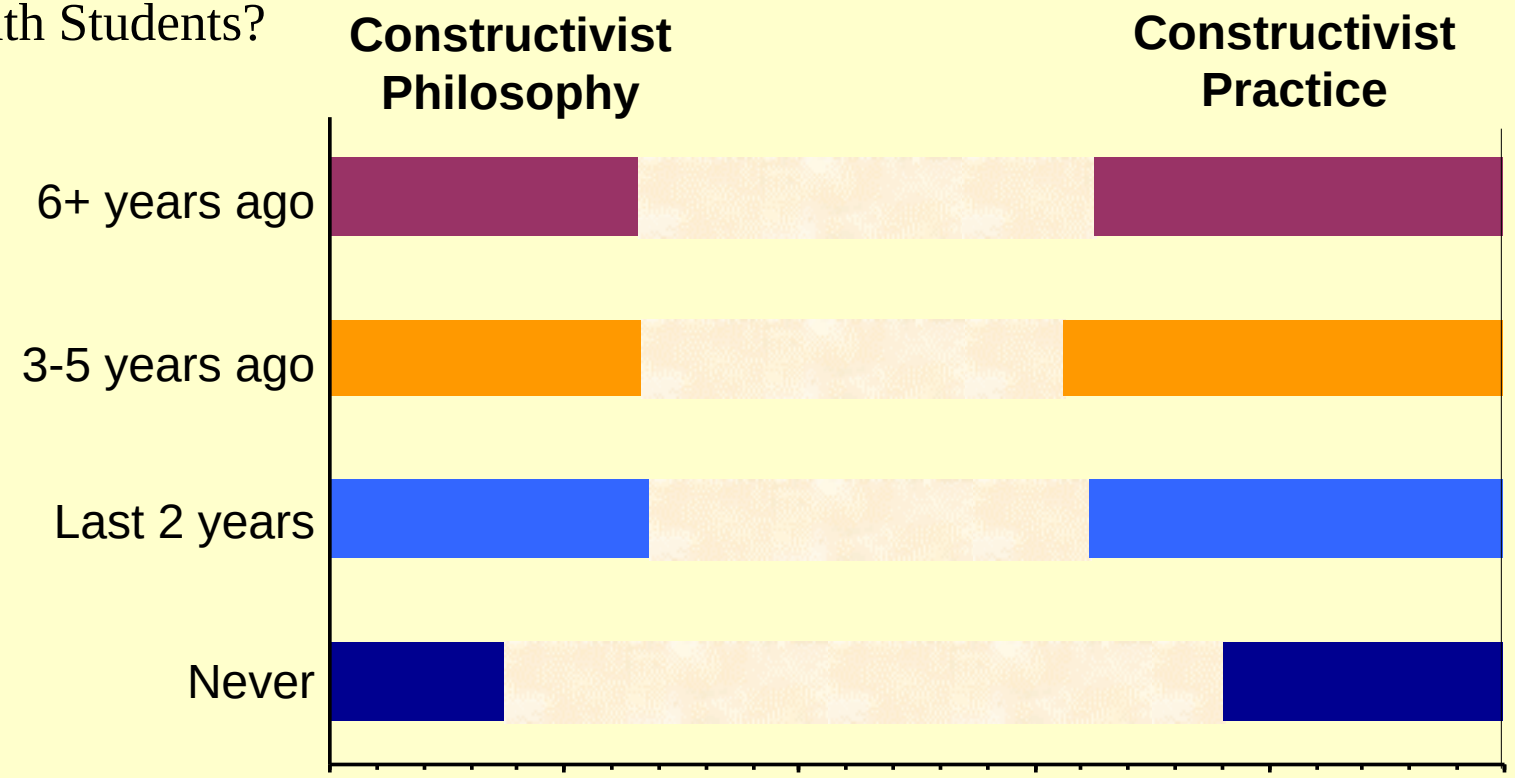


Constructivism by Teacher's Educational Investments

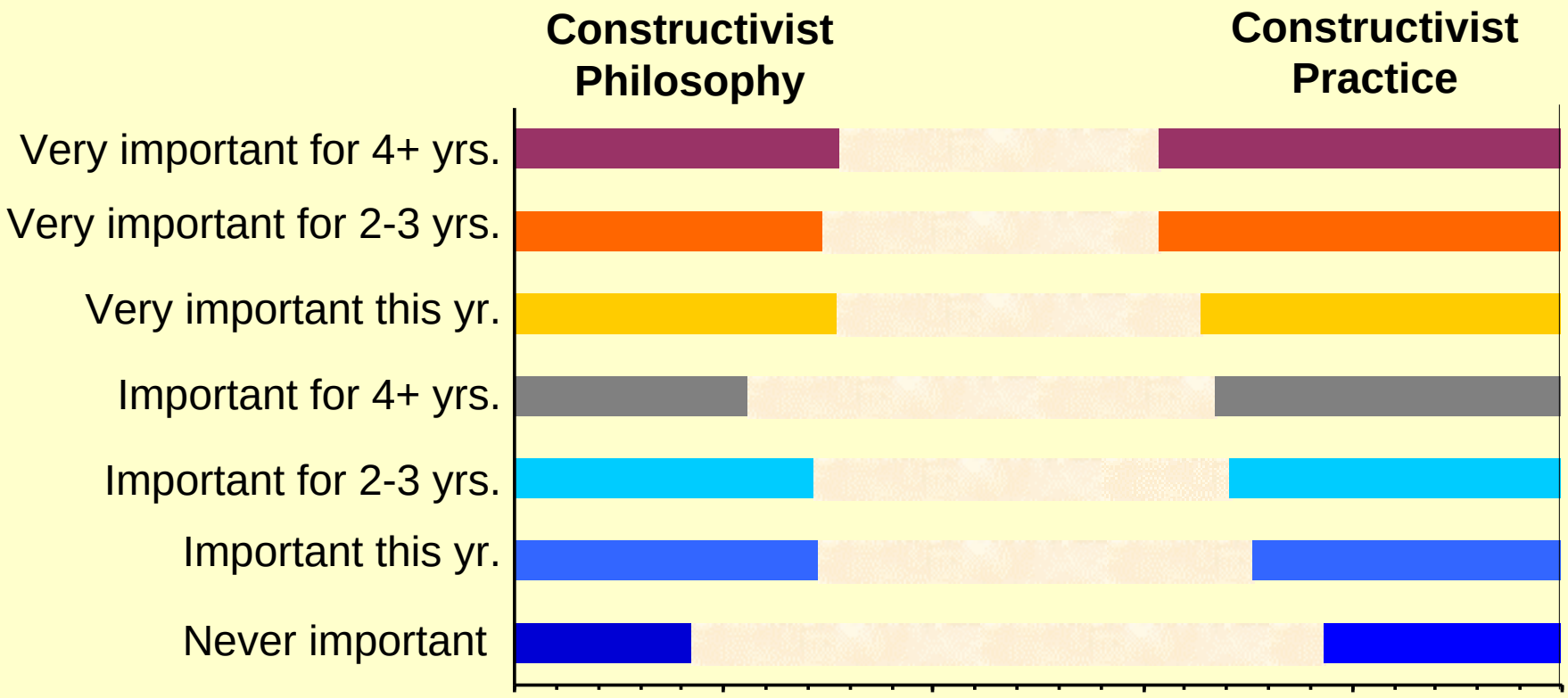


Teachers Who Don't Use Computers With Students Are JUST DIFFERENT!

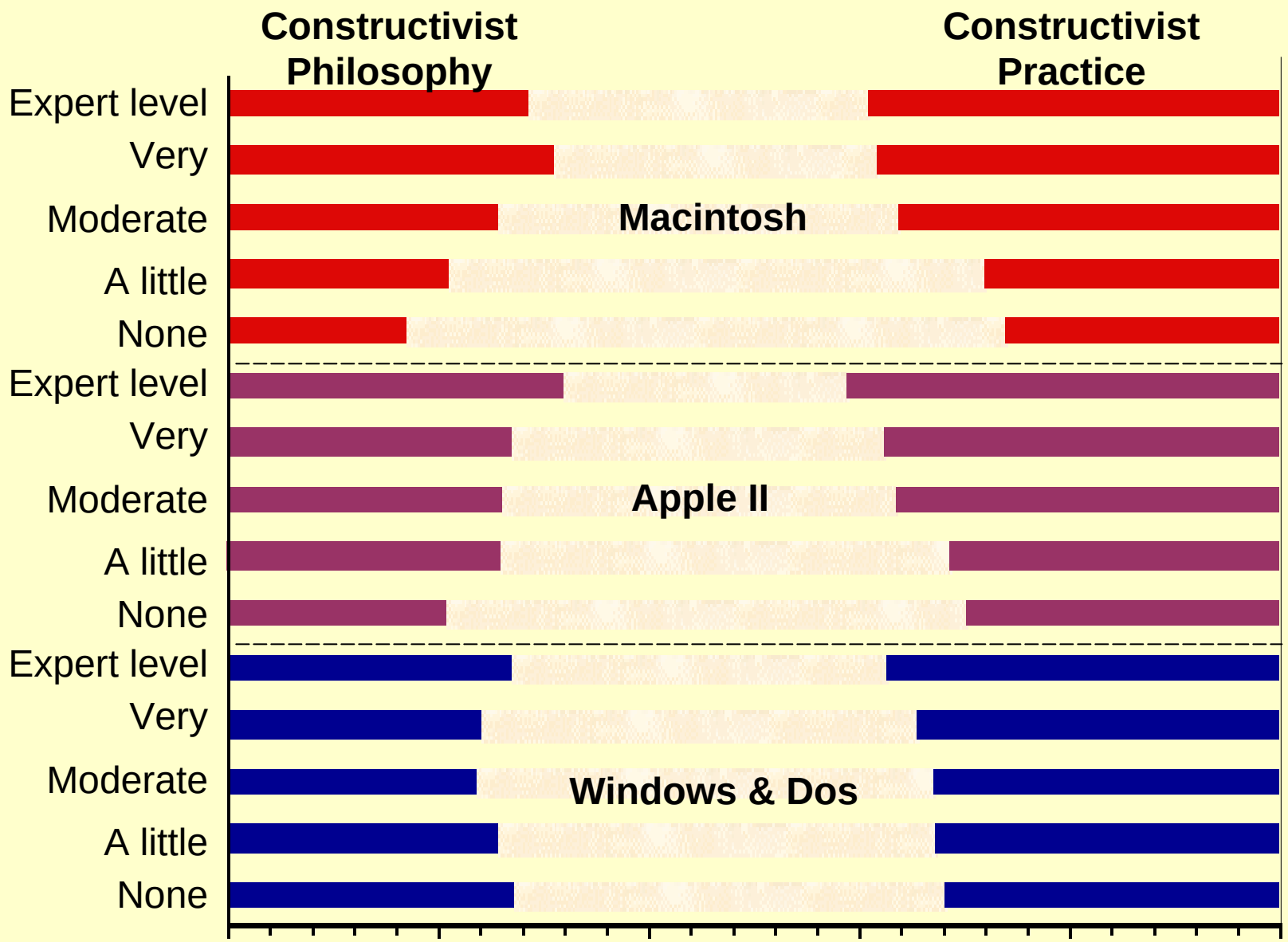
When First Used Computers with Students?



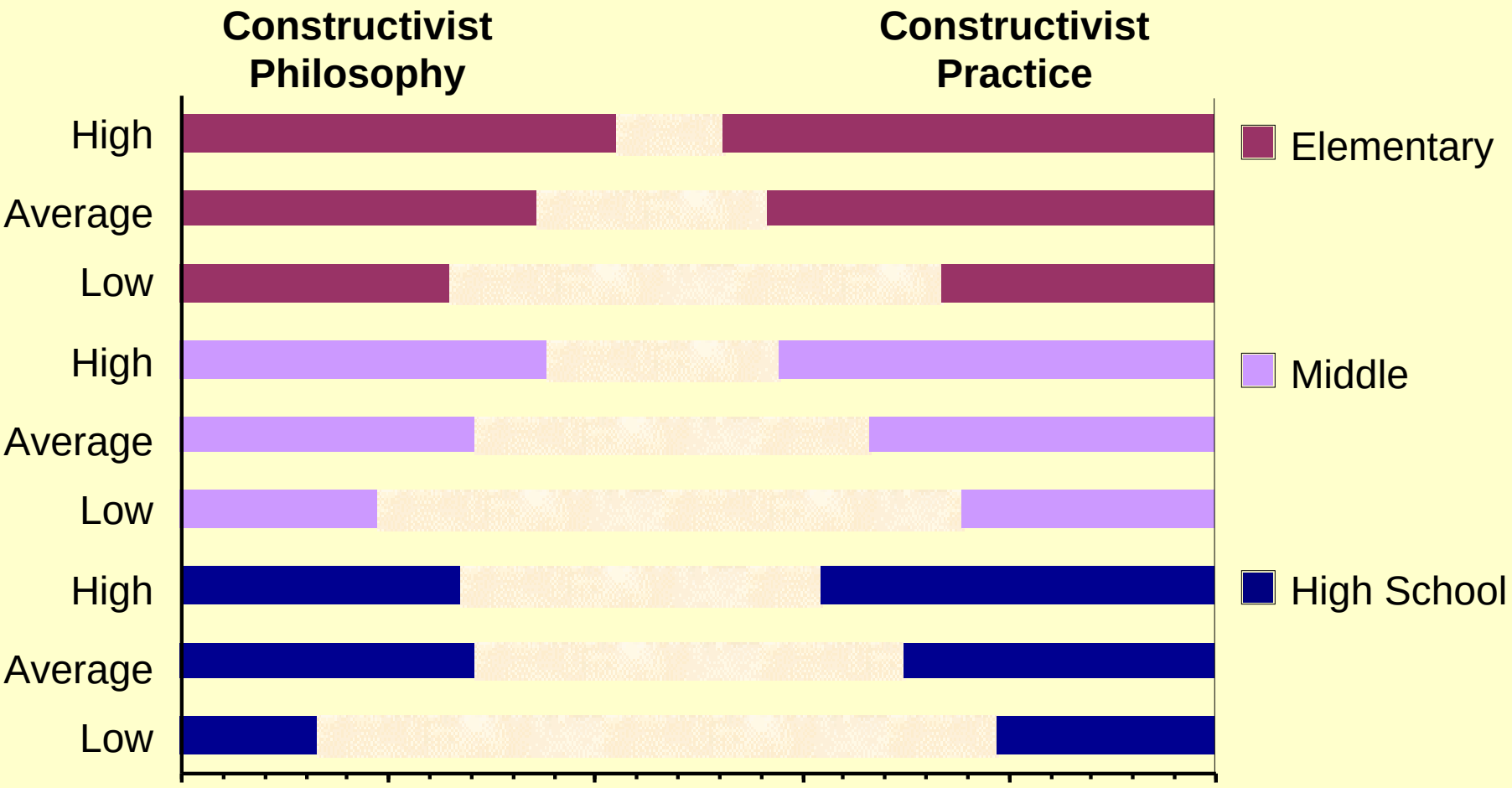
The Longer Computers Have Been Important to the Teacher and the More Important They Are, The More Constructivist The PRACTICE (but not the Philosophy)



Those Least Experienced with Macintosh and Apple II Computers are the Least Constructivist

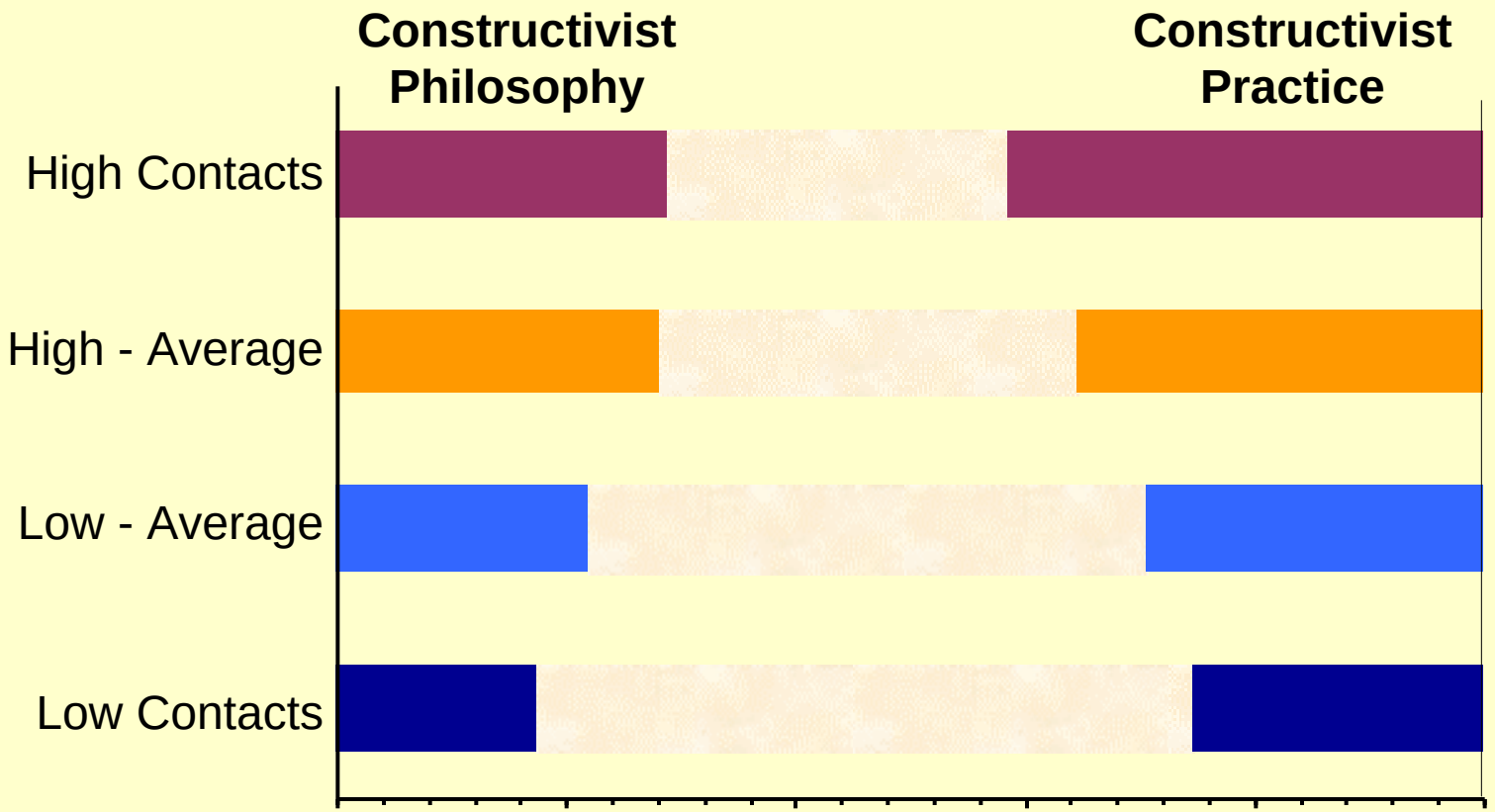


Several Aspects of Computer Use Together



Use computers; how long and how important; in classroom & lab; computer Expertise; experience with Macs and Apple IIs

Constructivist Teachers Have More Frequent Informal Contacts with Other Teachers at Their School

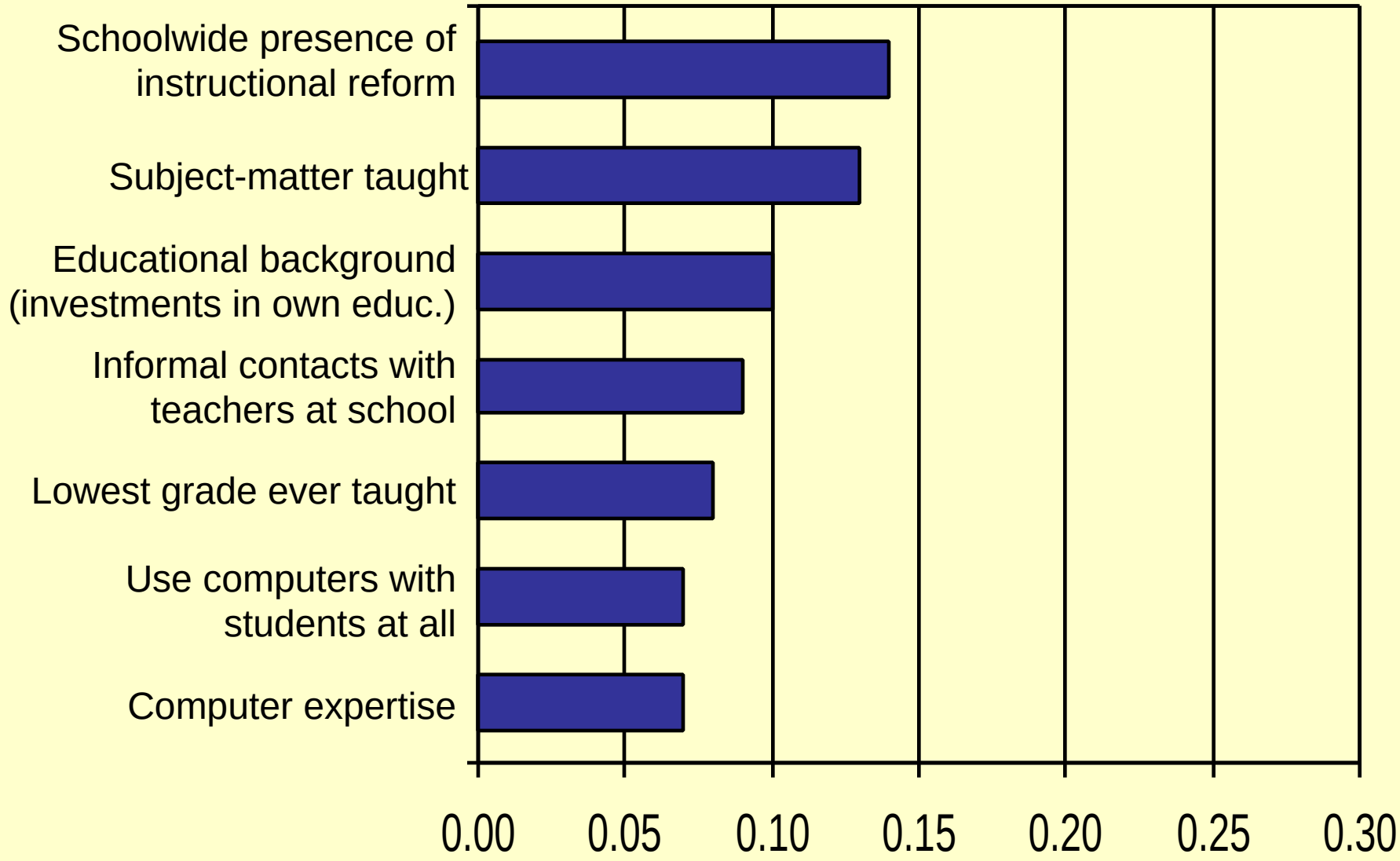


Discussions about teaching methods, subject content, technology, and personal matters, and frequency of observations of/by other teachers

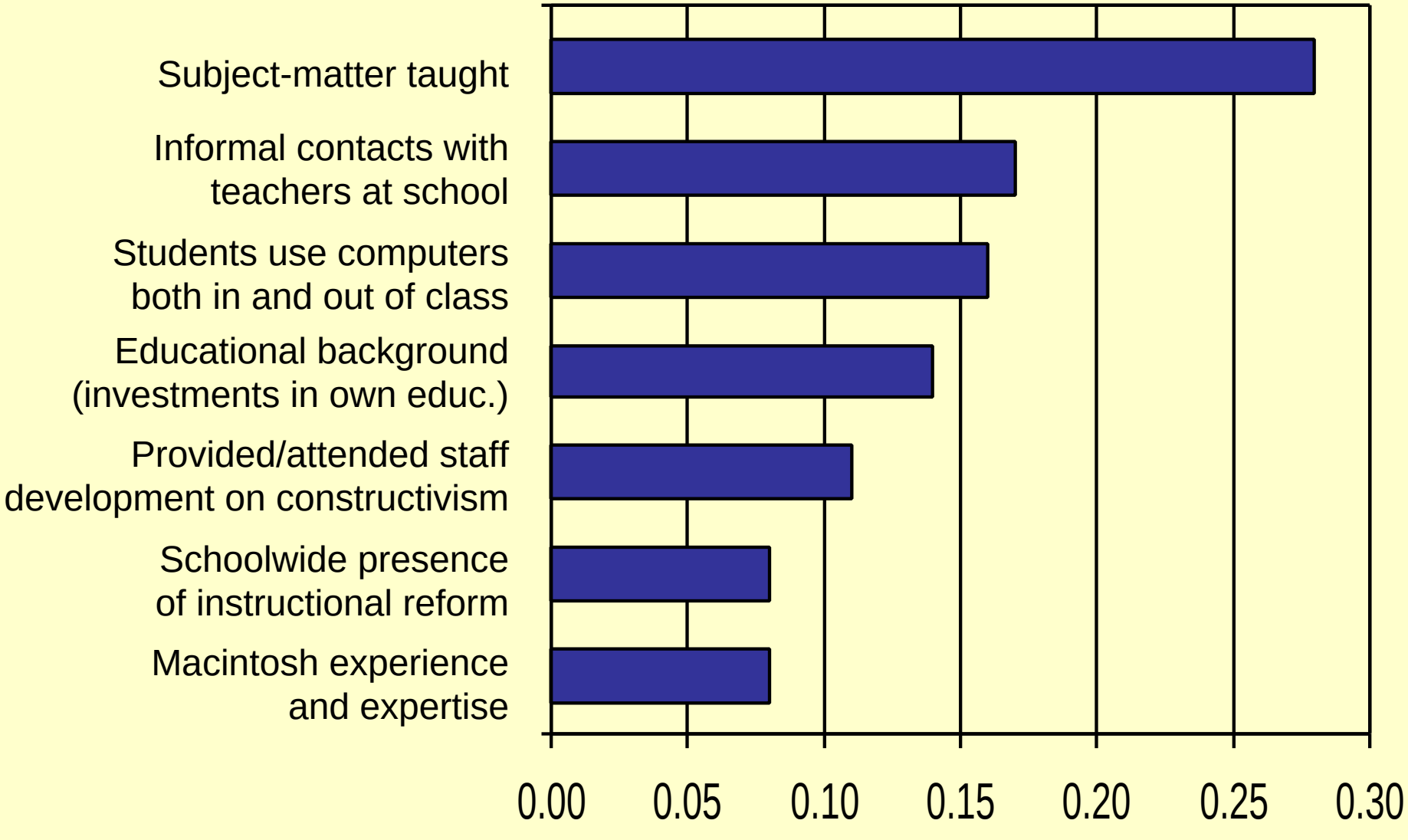
School Level Support For Technology and Reform and its Relationship to Constructivist Pedagogy

- Having more computers or newer computers – NOT RELATED
- Many teachers at the school broadly involved in using computers —PHILOSOPHY IN MIDDLE AND HIGH SCHOOL
- High rate of participation in constructivist uses of the Internet – YES
  - ELEMENTARY: TEACHER
  - MIDDLE/HIGH: STUDENT
- Presence of Reform Programs and Principal's Attitude
  - PHILOSOPHY BUT NOT PRACTICE
- Schoolwide Instructional Practices (Constructivist vs. Traditional) – YES, BOTH PHILOSOPHY AND PRACTICE

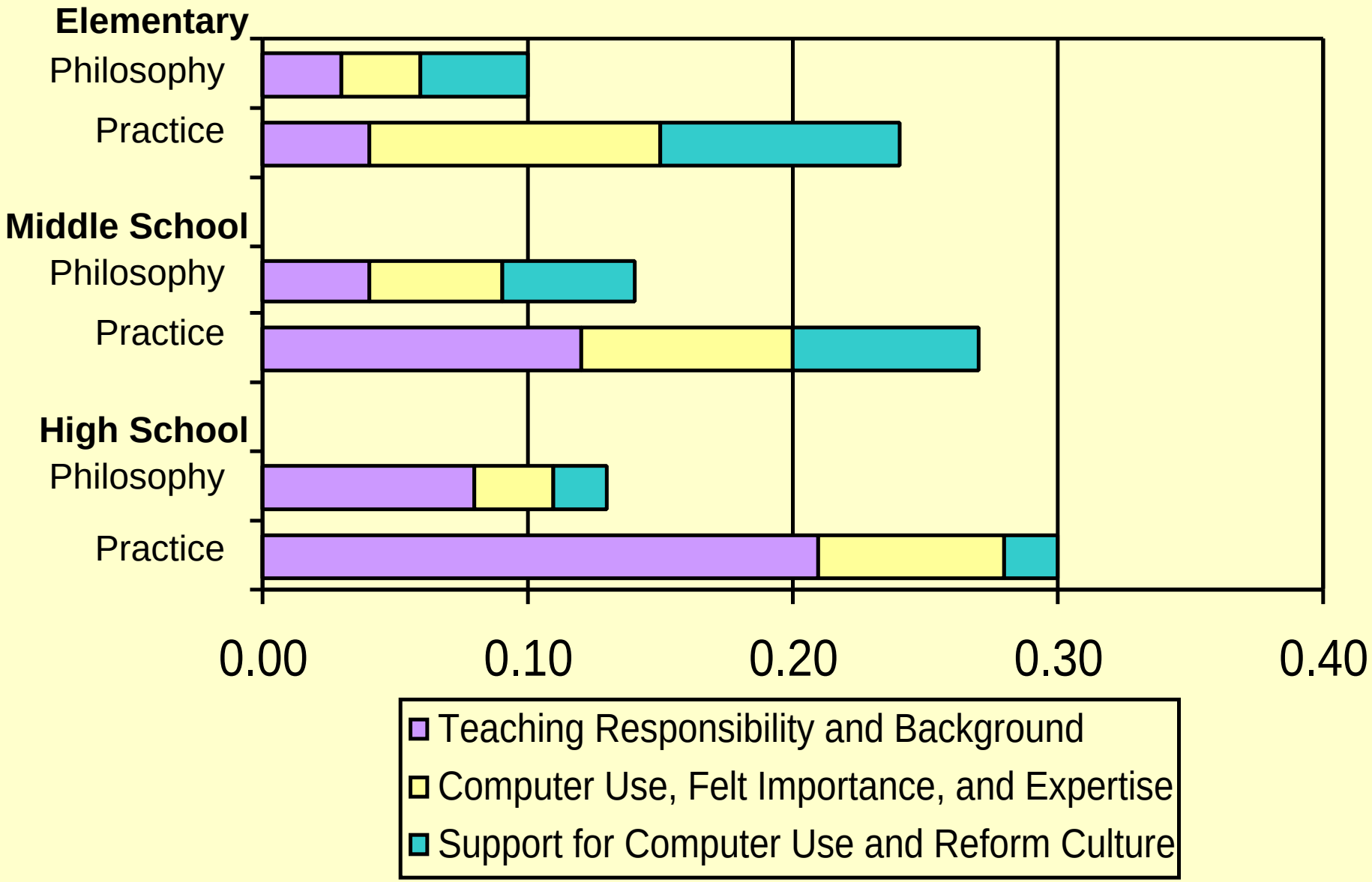
Strongest Individual Predictors of Constructivist Philosophy



Strongest Individual Predictors of Constructivist PRACTICE



Simultaneous Prediction of "Effects" on Philosophy and on Practice



Future Reports from the Teaching, Learning, and Computing Survey

- School Technology Investment Practices & Teachers' Use
- Teaching and Computer Use in School Reform and High-Tech Schools
- Technology Coordination, Support, and Staff Development and Teachers' Uses of Technology
- Professional Climate and Culture, Teachers' Pedagogies, and Their Uses of Technology
- Teachers' Assessment of the Impact of Technology on their Teaching Practice
- Computer Use and Pedagogy in Social Studies, Science, Math, etc.
- Computer Use in the Middle Grades
- Conference Presentations at NCTM, NSTA, AERA, and NECC

For More Information visit our Research Project Web Site:

www.crito.uci.edu/TLC

- New findings presented weekly
- Discussion group
- Reports and newsletters: view or download
- Archive of previous newsletters and findings