

How Can Technology Contribute to Raising Minority Achievement?

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Model of Instructional Reform I:

Emphasize Teaching for Understanding

- Focus on challenging objectives: critical thinking, problem solving
- And equally challenging tasks...
 - Students articulate reasoning (such as through writing)
 - Edit and revise their work—not just turn it in
 - Engage in peer discourse and group decision-making
 - Do meta-cognition: check their understanding
- Assessment consistent with these learning goals and tasks
- All of this made feasible by...
 - More resources: information, “thinking tools,” communication
 - Reorganizing classroom structures and roles
 - Teacher models the learning process
 - Students given more responsibility and freedom
 - Tasks that are motivating because they are meaningful

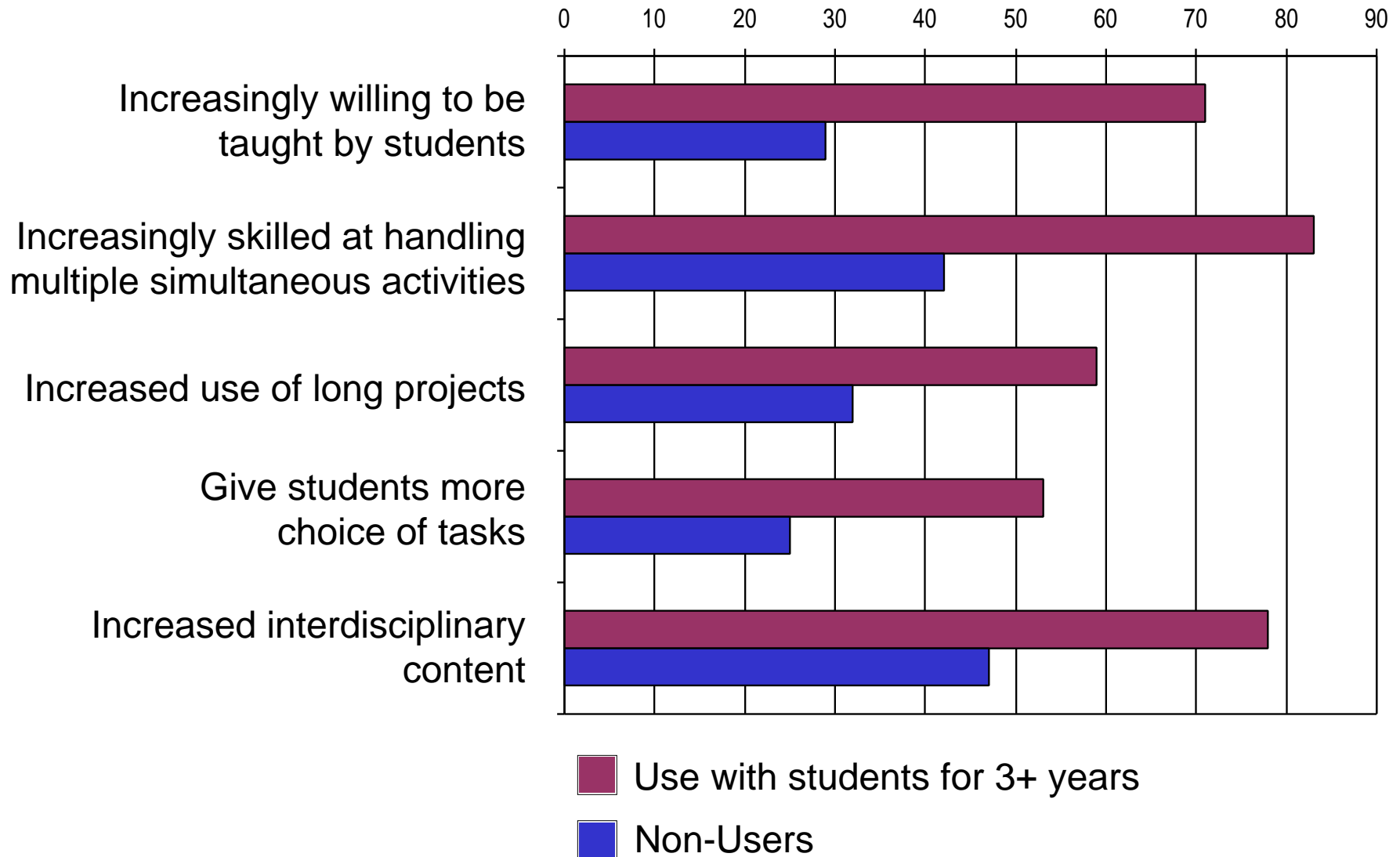
Model of Instructional Reform II

Make Meaningfulness The Primary Attribute of Tasks

- Contextually rich learning tasks
 - Projects
 - Real world applications
 - Authenticity
 - Depth
 - Skill learning embedded, not just a separate “skills” activity
- Take students’ thinking and feeling into account
 - Students’ prior beliefs
 - Student interests help determine tasks
 - Student choice in tasks and methods
- Reorganize classroom structures and roles
 - Cooperative work groups
 - Students given leadership roles
 - Student initiative facilitated

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

National School Network survey, Spring, 1997



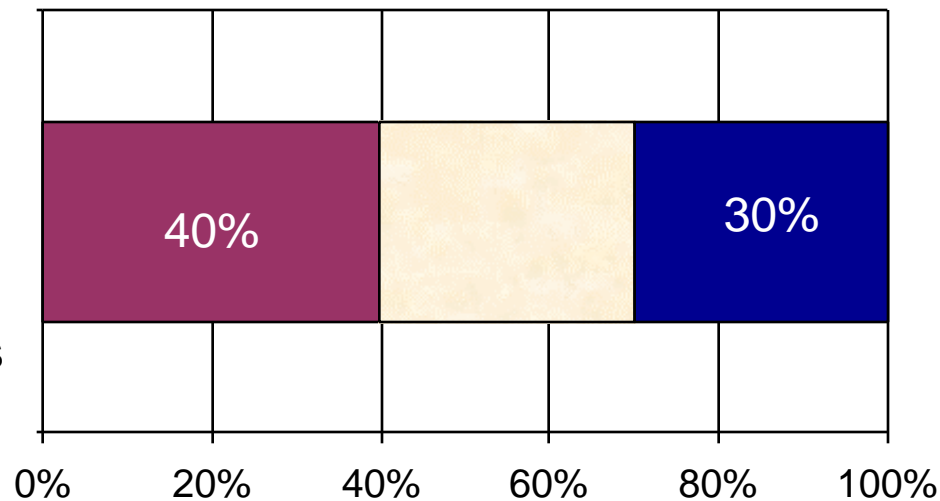
Teaching, Learning, & Computing--1998

- 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

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.”

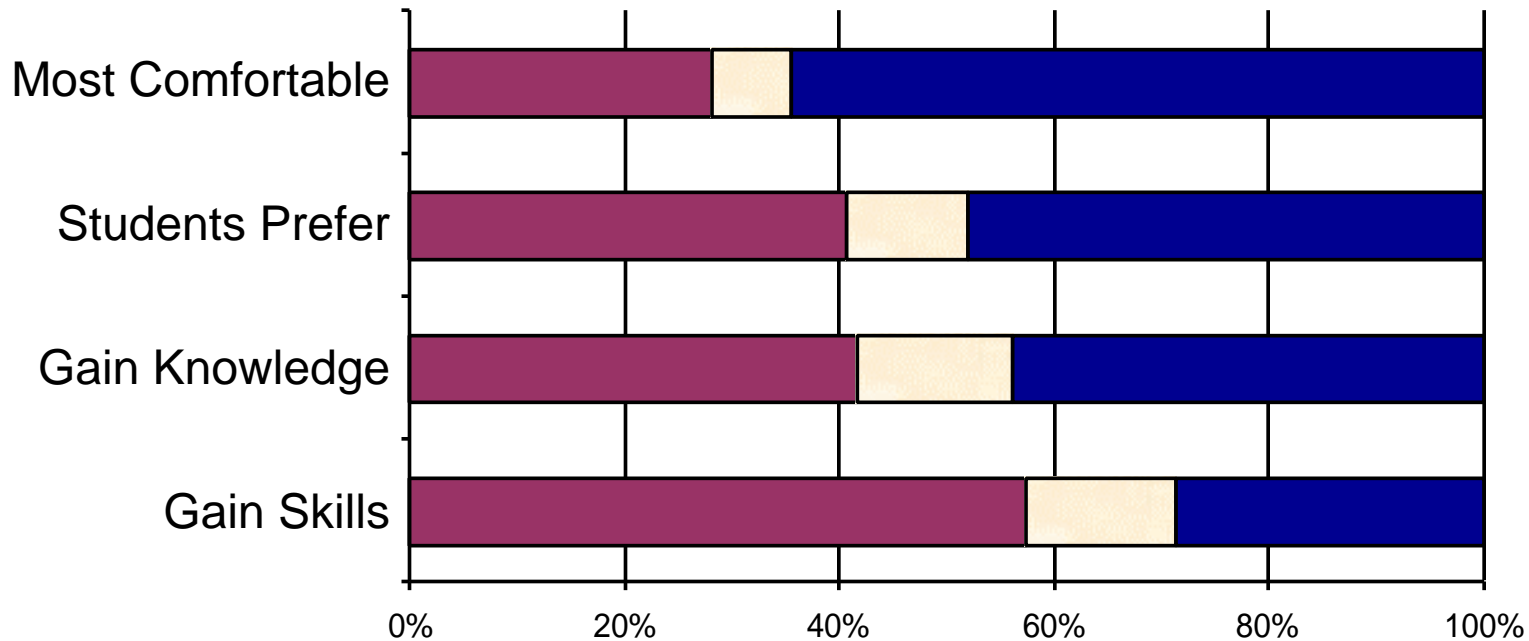
Two Teachers Compared

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.

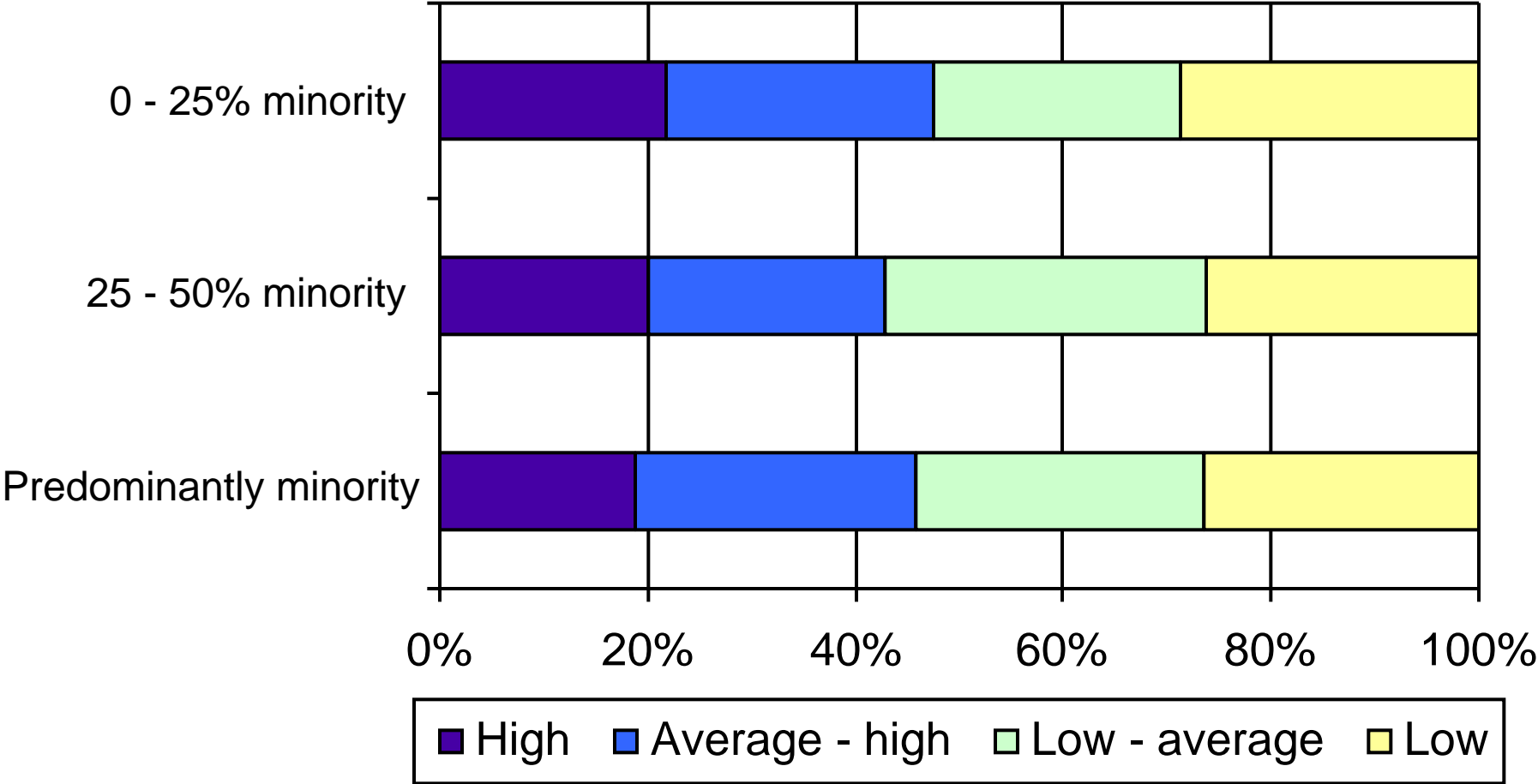


18 Indicators of Constructivist Philosophy Include Teacher's Belief That...

- Students are ready for meaningful learning before acquiring basic skills
- Students should help decide what activities are to be done
- Instruction should include problems that are ambiguous, lack clear right answer
- Having background knowledge is not the main requirement for learning
- Teachers should act as facilitators rather than “explainers”
- Student thinking is more important than content of the curriculum
- Interest in academic work is more important than the specific facts in textbooks
- A variety of activities is better than the same assignment for all
- Short-answer and multiple-choice tests have limited use in assessment
- Open-ended problems are useful in assessment
- Individual and group projects are useful in assessment
- Student presentations/performances are useful in assessment
- Teachers should entertain students' ideas rather than “owning” all knowledge
- A quiet classroom is not needed for effective learning
- Teacher feels more comfortable facilitating than in providing direct instruction
- Students prefer teachers being a facilitator to having direct instruction
- Students gain more knowledge from teacher as facilitator rather than explainer
- Students gain more useful skills from teacher as facilitator rather than explainer

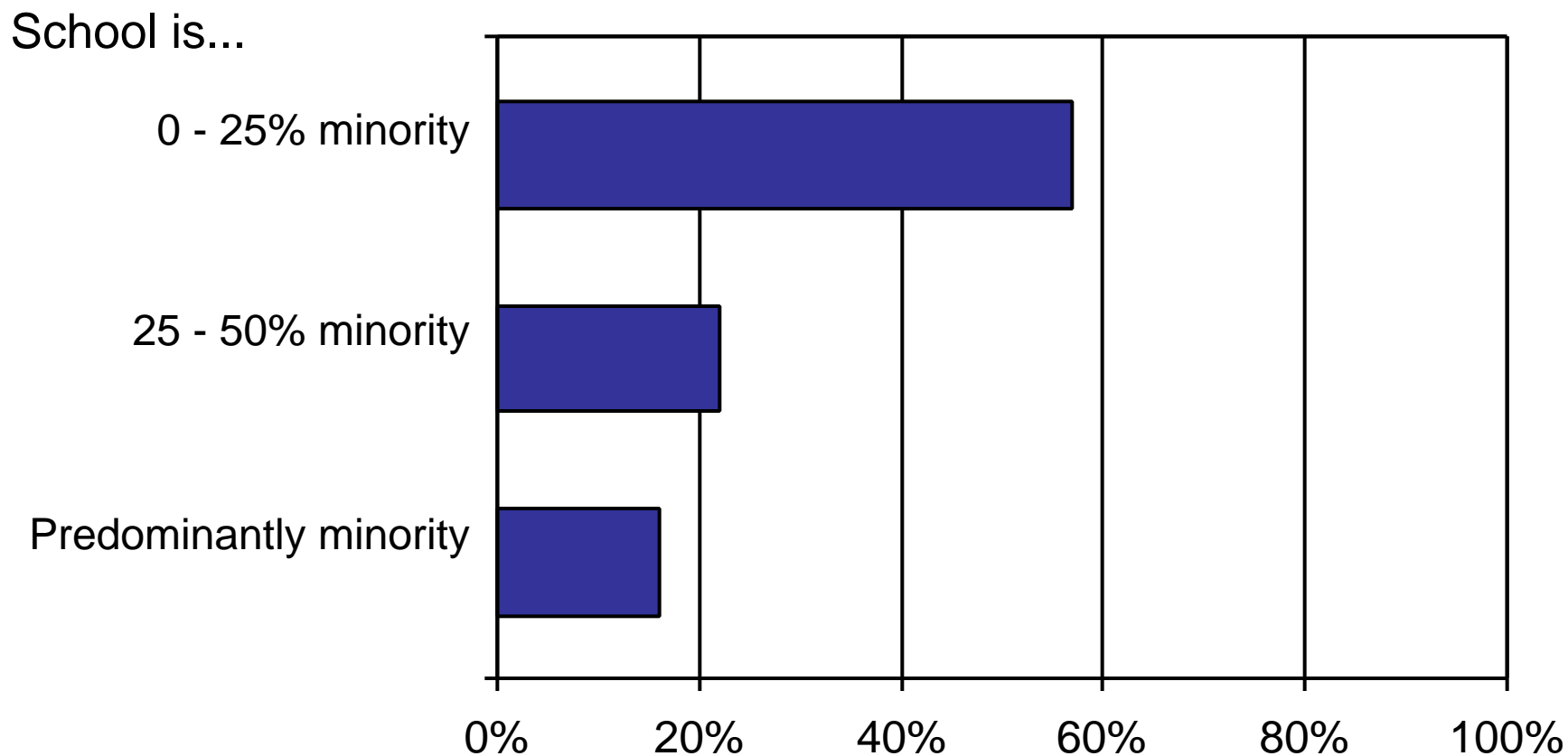
Teachers in High and Low Percent Minority Schools Have Similar Teaching Philosophies

Reform Philosophy Score (quartiles)



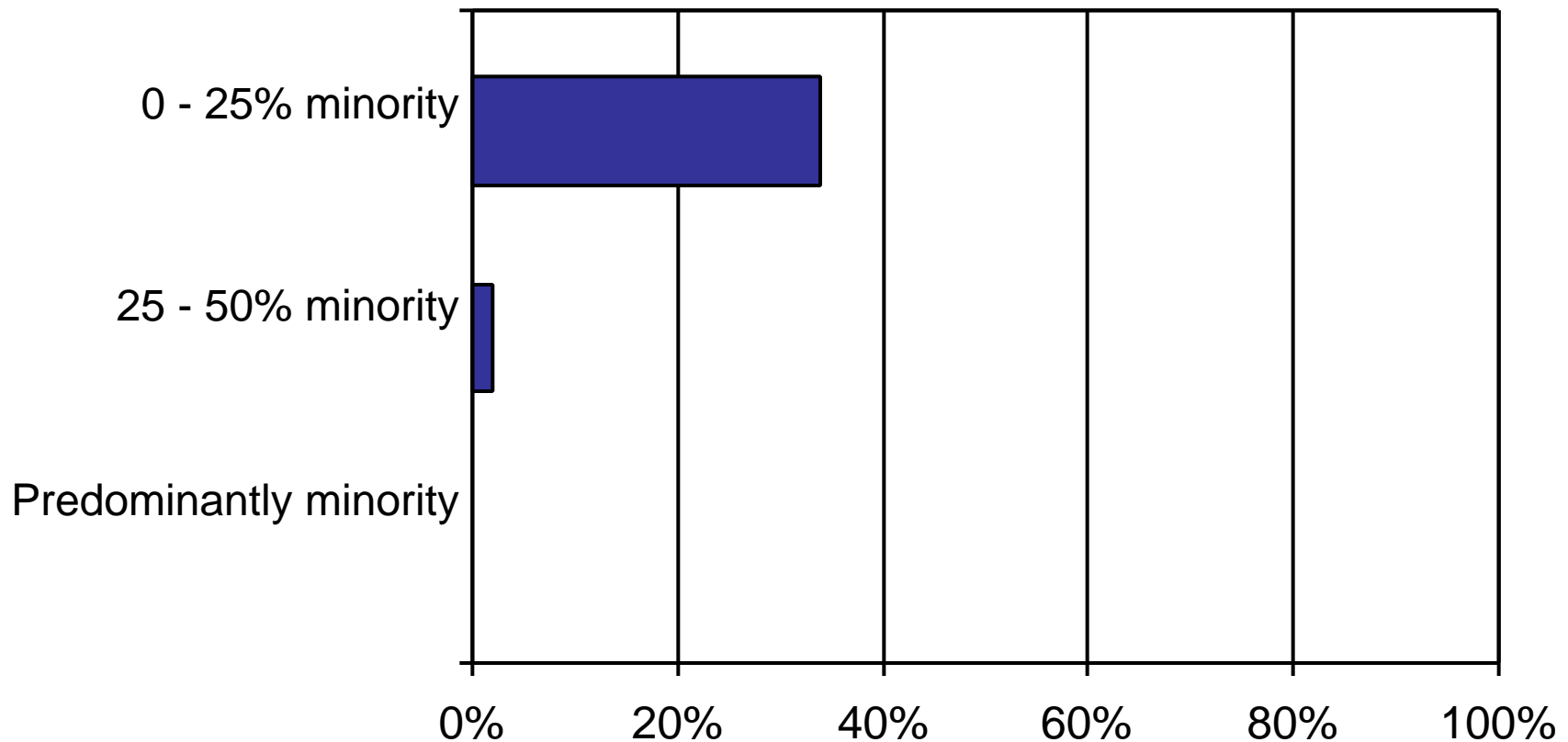
Minority Students Are Much Less Likely to Have a Computer at Home—or to be in a school where other students have a home computer

Percent of students attending a school where at least 1/4 of students have a computer at home

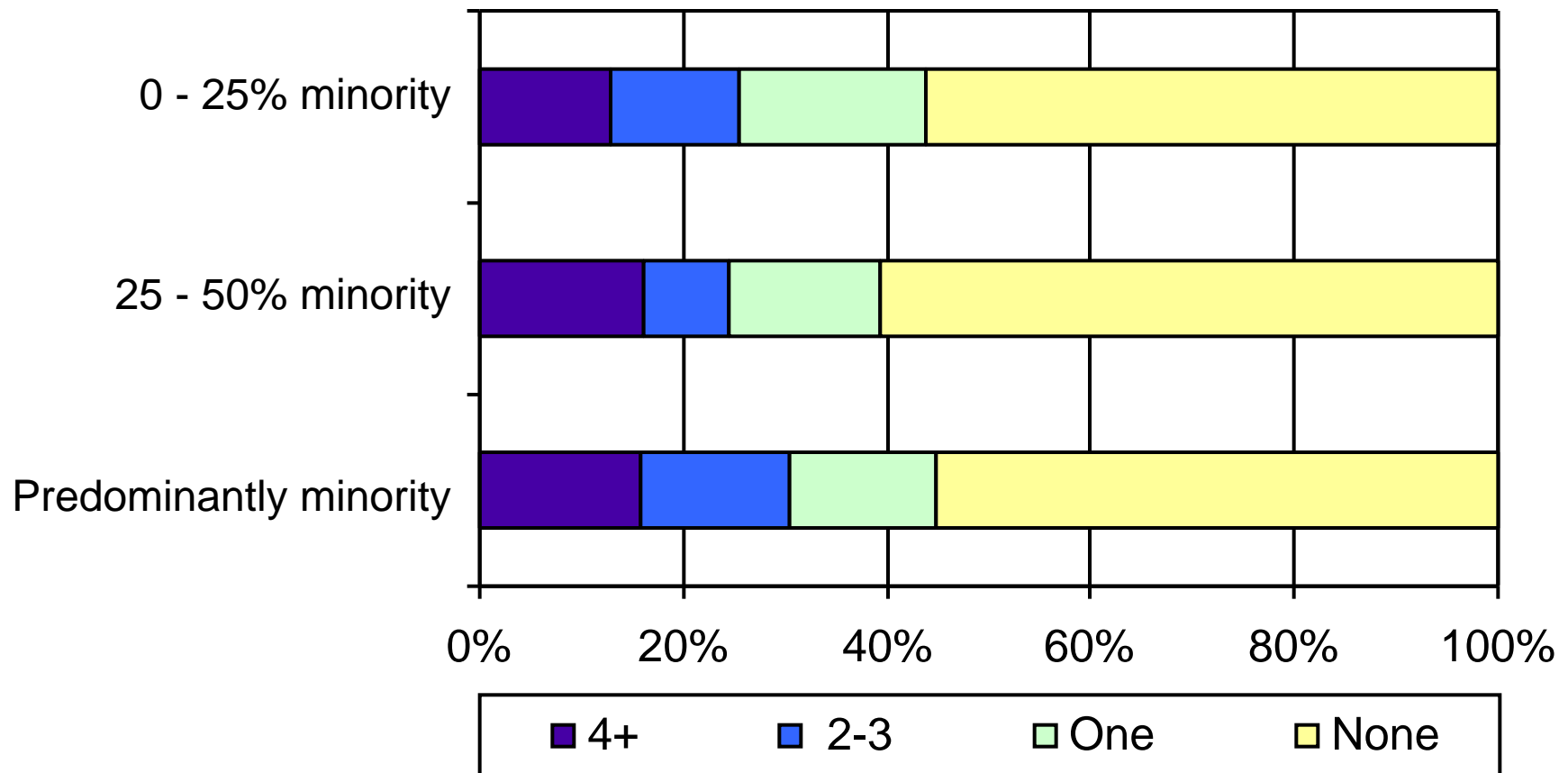


Not only do few minority students have Internet access at home, but almost none attend a school where many students do

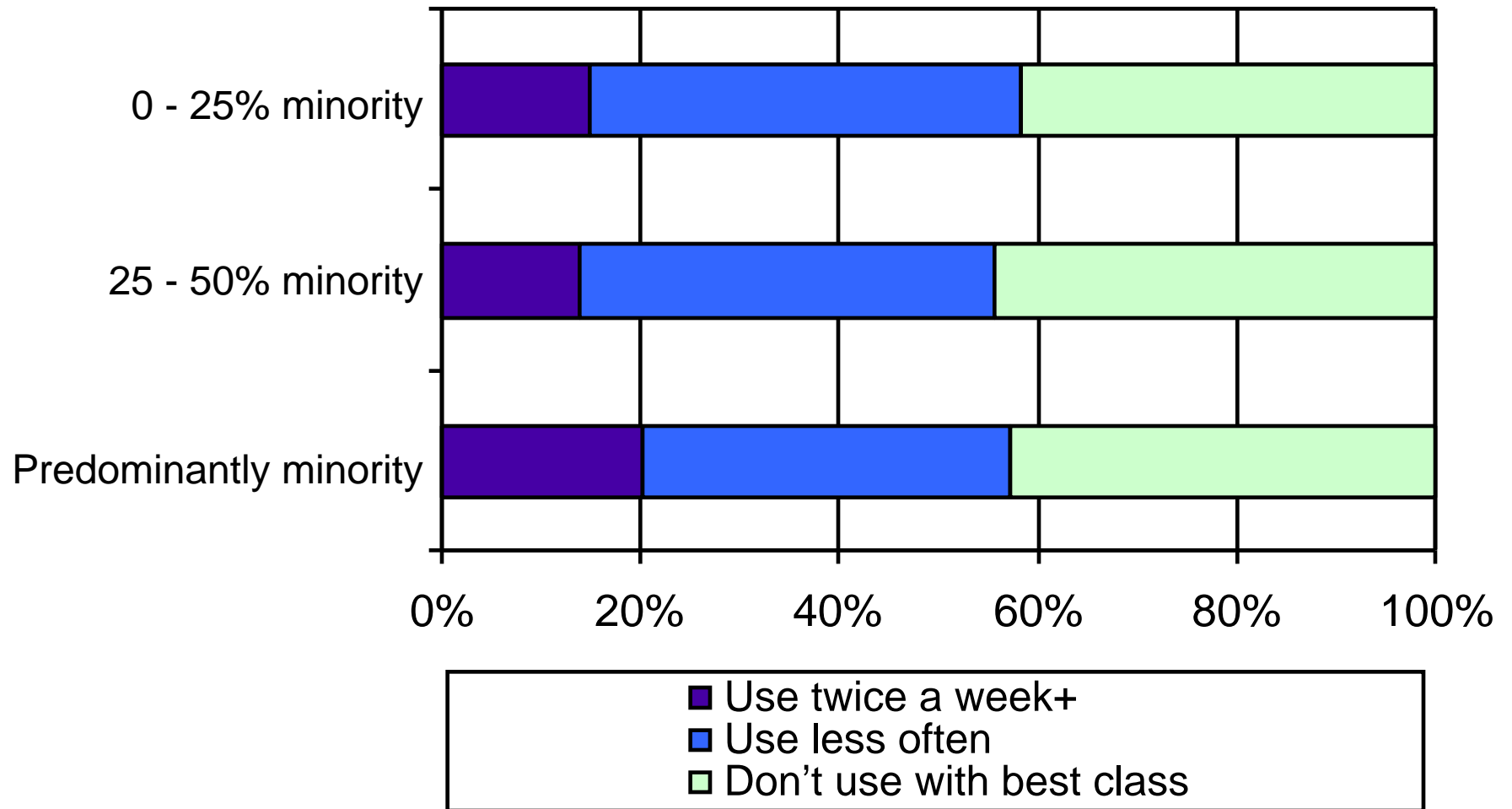
Percent of students attending a school where at least 1/4 of students have **Internet** at home



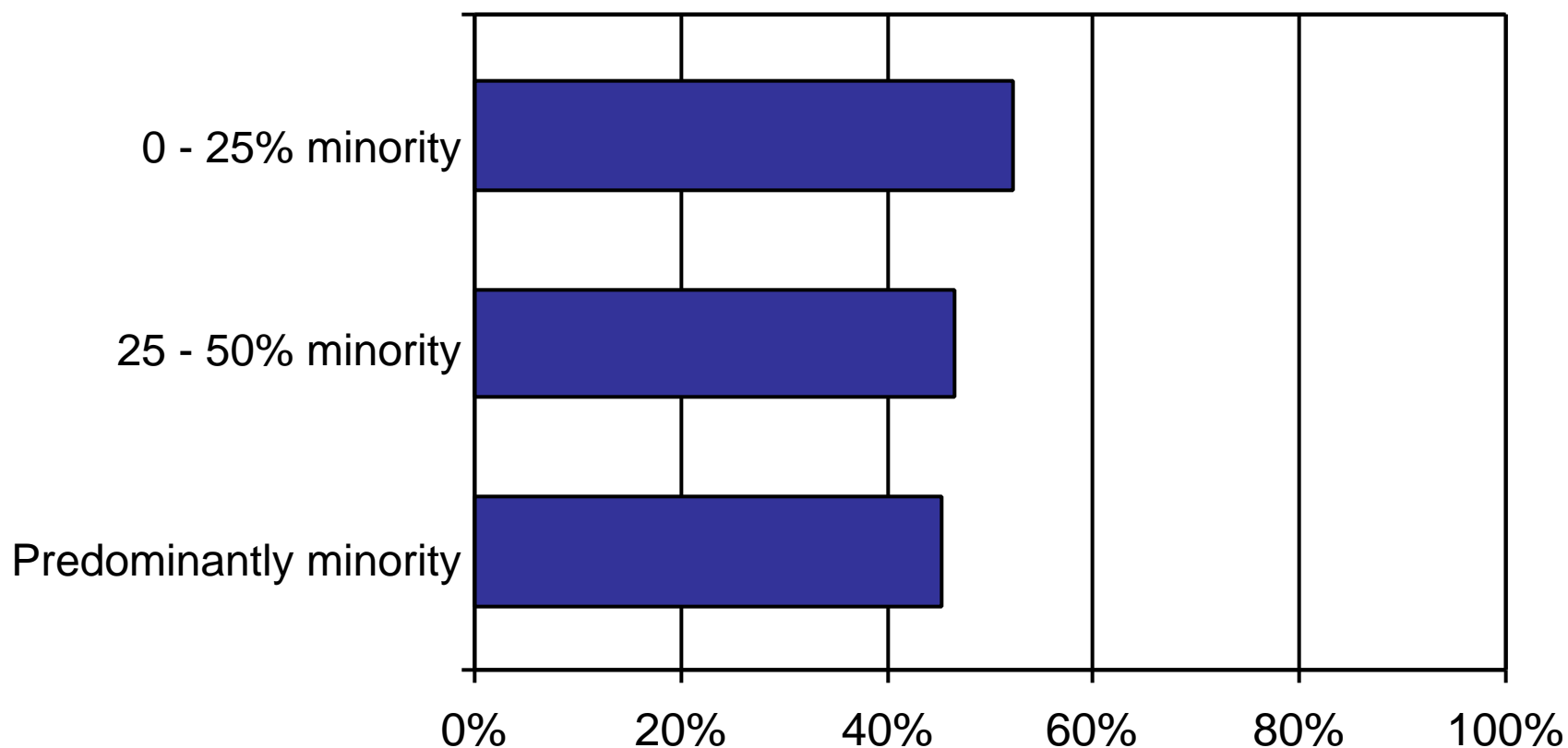
Teachers in High Minority Schools Have at Least as Many Computers Available in Their Classroom



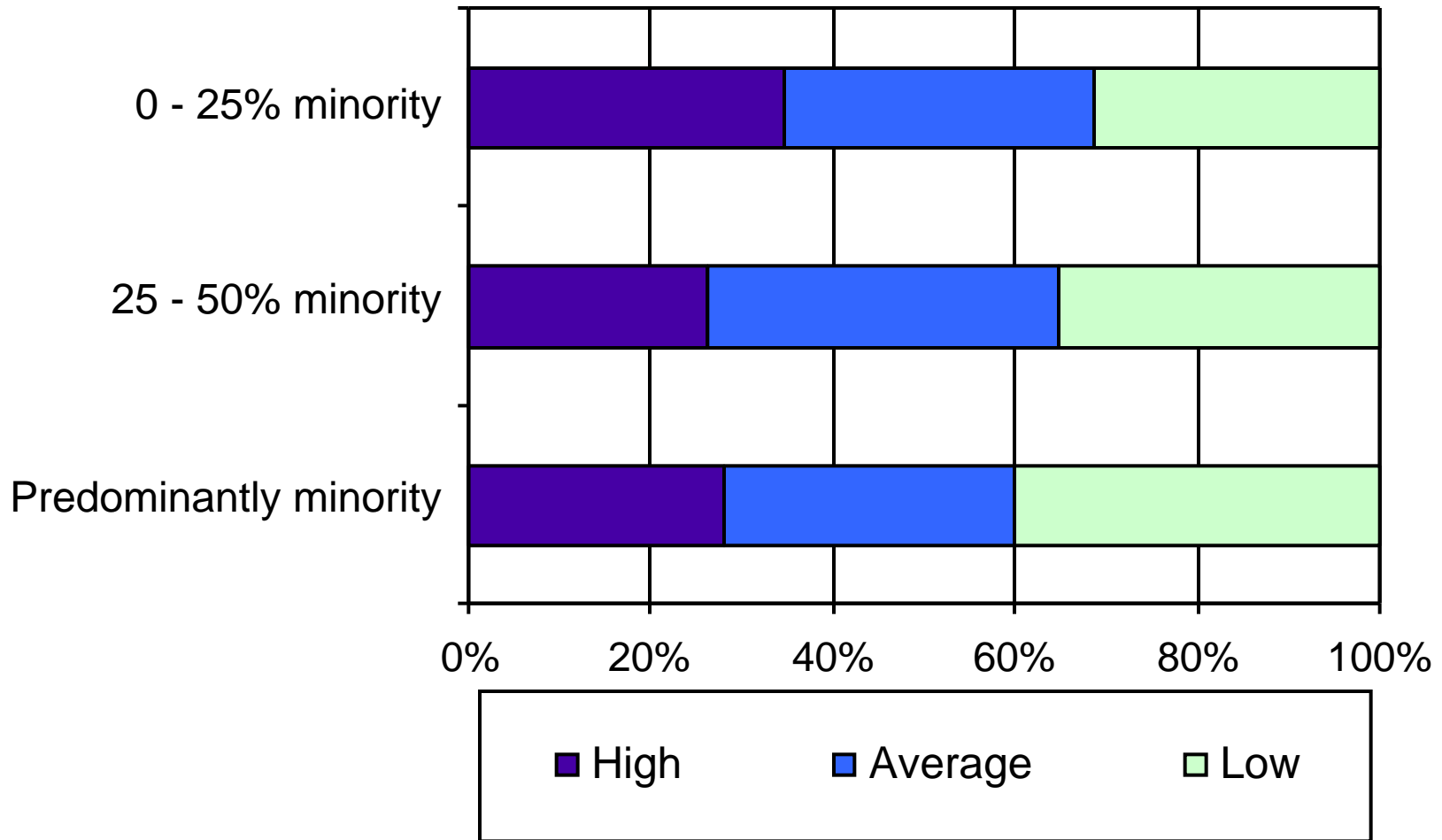
And They Use Computers Equally Frequently with their Classes



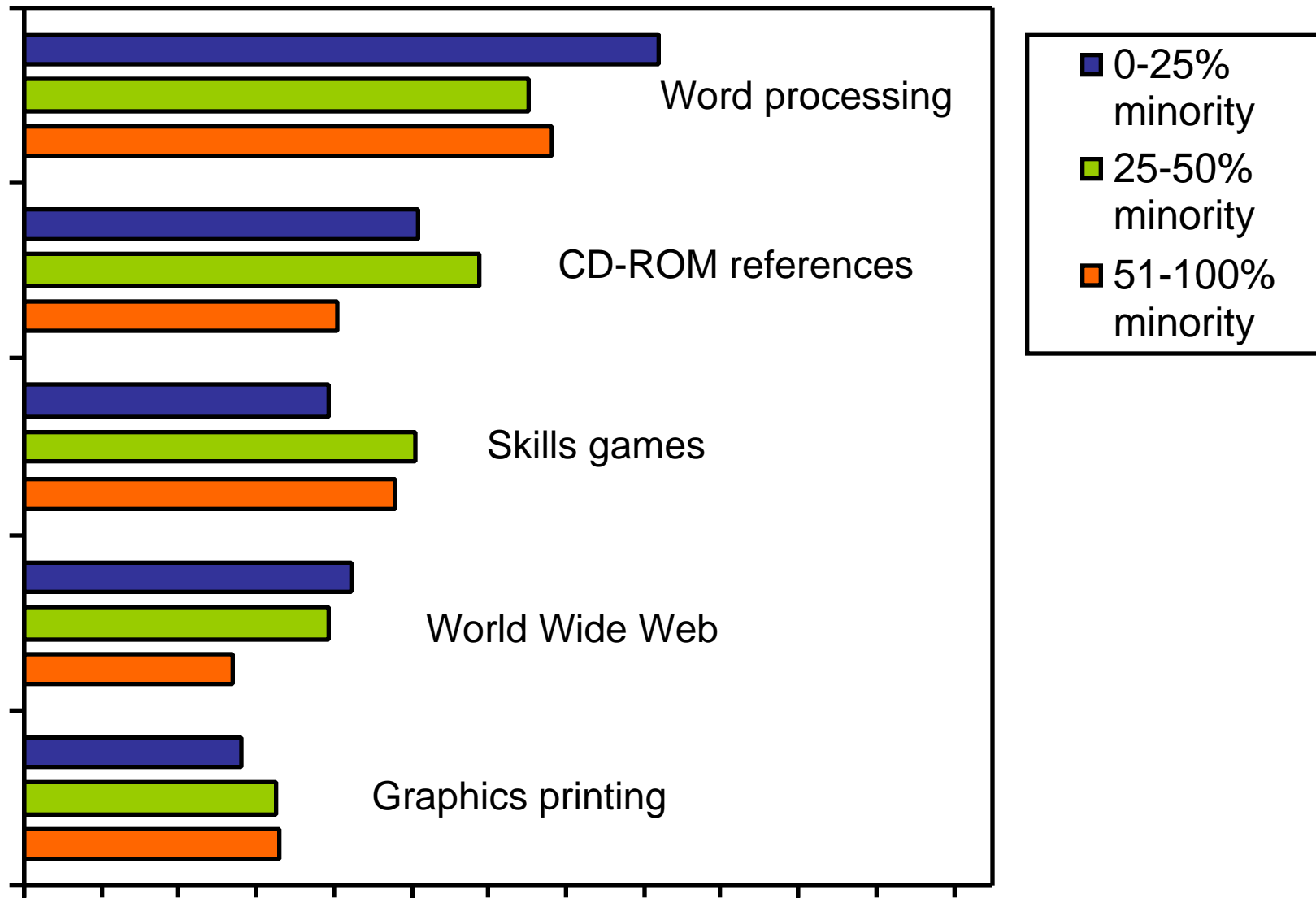
Fewer Teachers in High Minority Schools Consider Computers “Very Important” to Their Practice



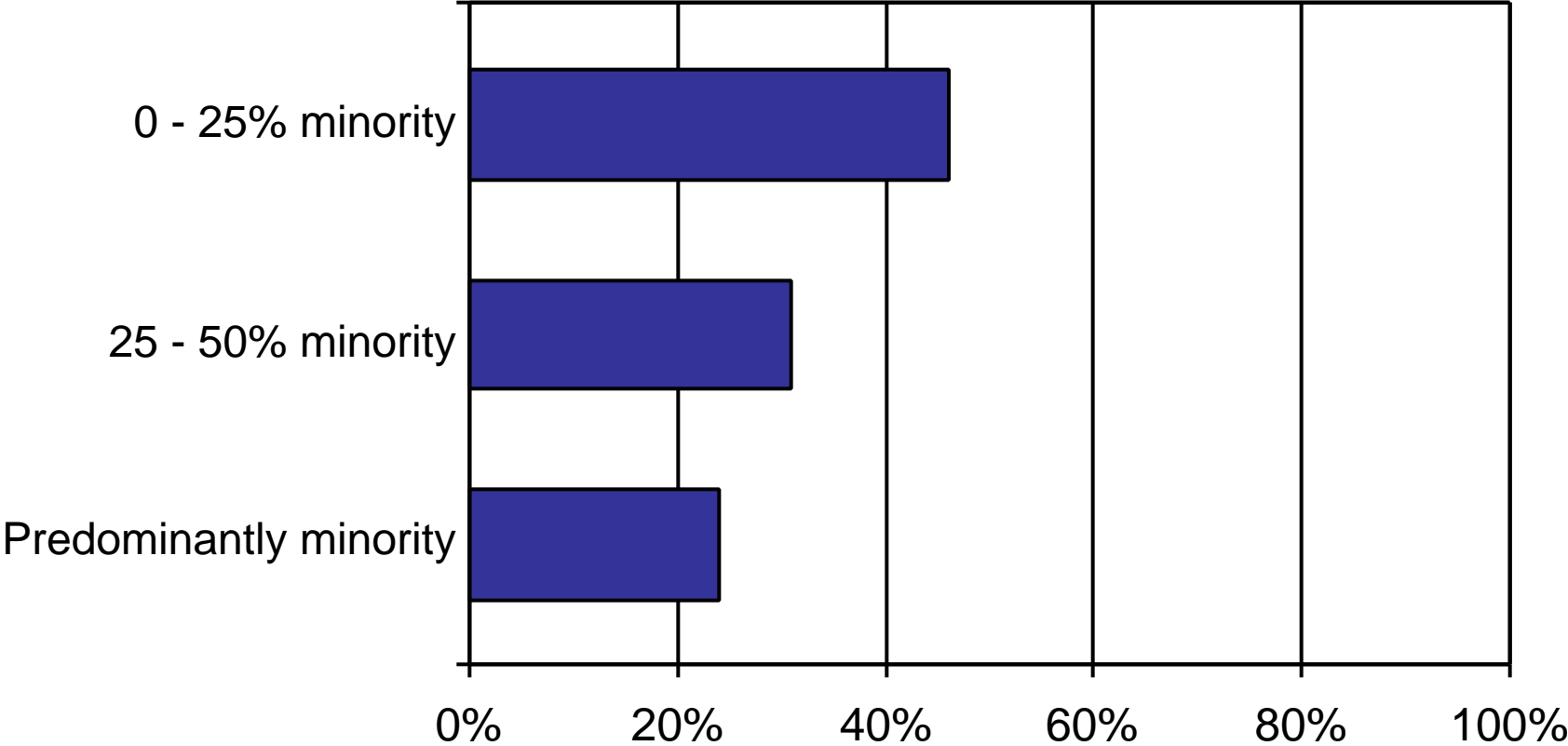
Teachers in High Minority Schools Have Less Computer Expertise, on Average



Teachers in High and Low Percent Minority Schools Use Somewhat Different Mixes of Software



Teachers in High Minority Schools Are Much Less Likely to Have Internet Access in Their Classroom



TEACHING, LEARNING & COMPUTING 1998



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