From your reading of chapter 13 and your own knowledge from other sources, discuss the following:

Many studies in computer science compare different technologies and do not involve human factors.

For example, a study of a new algorithm may seek to determine whether it runs faster than an older version on practical data sets.

However, many empirical studies in software engineering involve human subjects, because they need to assess the usefulness of development techniques for the people who will use them. What are the things that make studies using human subjects different from studies that do not?

Our text references Henry et al (1994) as attempting to answer questions such as "How can we quantitatively assess the maintenance process?" and "How do we quantitatively evaluate the effectiveness of any process improvements?" These are two examples of attempting to transform qualitative assessments to quantitative metrics by which they may be measured.

Another complication is that humans present a resource that is "highly variable:"

> For example, software engineers with equal training have very different abilities. We all know developers who are good at coding but terrible at testing or who are good designers but bad requirements analysts. Even within a category, there is variation; indeed, some programmers can write poor code quickly or good code slowly or just about anything in between! (Pfleeger, S., & Atlee, J., 2006)

Tom Demarco and Timothy Lister's book *Peopleware* tackles other human issues that are difficult to quantify, but are measured in terms of anecdotes and worker satisfaction. They mention the need for windows in offices, quiet workspaces, allowing developers the time to think, and regular meetings that serve no purpose other than to reaffirm the team organization. They recommend metrics such as turnover rates as a quantitative measure of how well a team is functioning, because a team with purpose will have fewer members leave in the middle of a project and developers who are less worried about advancement and salaries (Demarco and Lister, 1999).

References:

Demarco, Tom and Lister, Timothy (1999). *Peopleware: Productive Projects and Teams, 2nd Edition.*

Pfleeger, S., & Atlee, J. (2006). *Software Engineering: Theory an Practice*. New Jersey: Prentice Hall.