# Technology and resource allocation

Technology

The regression for the " Expenditures per Student" variable gives surprising results. One would normally consider higher spending on each student to be a strong factor in his performance. For example, higher paying districts can attract the better teachers, afford the better textbooks, and provide the better facilities. While this logic appeals to common sense, it does not appear to hold an equal attraction to the actual figures.

The analysis shows that the variation in expenditures per student only explains an astonishingly low 3. 7% of the variation in the test scores. The slope further elucidates that when the expenditures per student increases by one unit, the average test score goes up by 0. 006.

How can something that seems so beneficial be so worthless? In explaining this, it is probably best to ponder how schools would spend the money they receive. Perhaps the schools that receive the most money are the ones failing, and an increased budget is seen as the most efficient way to boost their performance.

However, perhaps these schools spend their funds on increased campus security and metal detectors. Whatever the reason, some districts must not be allocating their money as efficiently as they could or have non-score-increasing needs (such as safety) that drain their budgets, but to determine this would require a whole new set of data. The regression for " Computers per Student" gives promising but perhaps misleading data. The R2 statistic asserts that 7. 3% of the variation in the data is explained by variations in the computer to student ratio.

Something to note is that even though the slope of the line is 79. 4, it is unrealistic to assume that one would ever increase the independent variable here by one unit. Given that it is a computer to student ratio, an increase of one would imply that the school bought a new computer for each student, in addition to what they already have. Perhaps it is more useful to say that if the school provides one more computer for every ten students, the score is likely to jump eight points. Again, these numbers may be misleading.

The schools that score well may be the very schools that have less of a need to spend money on campus safety and instead pour their savings into computers. Common sense would assume that because the STAR test measures reading and math, not technological proficiency, students will score equally well on the exam regardless of their school's computer to student ratio. Therefore, one may probably rightly assume that computers are not the cause of high test scores but that schools that enjoy a greater abundance of these machines also enjoy a greater preponderance of students who can score better on the STAR tests.

In any case, one cannot determine causality with the methods that we are using, so one is only allowed to note that some relationship does exist, that the cause is somewhat unknown, and that computers at least do not seem to harm test scores. Socioeconomic Varibles: Test scores are affected by a variety of factors. Many theories state that lower income districts have a lower average testing score, so common sense as well as our descriptive statistical predictions necessitate that it be examined. As seen above, average income and test scores have a positive relationship.

In fact, the regression line is. Or in English, as the district average income increases by 1 unit ($1, 000) then the test scores are raised by 1. 88 points. Also the R2 = 0. 51, or, in other words, 51% of the variance in the data can be explained by the single variable of district average income, which seems much more significant, being approximately 20 standard deviations from the mean, than the student teacher ratio on test scores. This can be explained by many hypotheses. One could assume that in a lower income district the focus at home is different.

For example, when the students leave school, they may go to a day care or they may go home to be by themselves. Therefore, homework may not be done directly after school to reinforce what was learned that day, so later in the evening they may have more difficulty time remembering the material. Also, when someone is not home to force the student to complete his homework, he is more likely to suffer from low motivation. Another possibility is that both parents may work full time or even double jobs to make ends meet.

Hence, the students cannot receive extra attention while they are learning, which is especially harmful when the material is complicated. In addition, the students may have other responsibilities at home, such as working at a job in the neighborhood or watching siblings, which results in a lack of study. Also higher income districts usually have a higher educational level of the parents. Therefore, it is reinforced in the home of the importance of education with a very tangible example of educated parents.

So those students may get more direct encouragement or direct support for their studies. Even if the high-income districts are not well educated, they can provide more of the necessary learning aids, such as calculators, rulers, and books. Average income also corresponds to other variables in the data, such as qualifying for CalWORKS (a welfare program that gives cash aid and services to needy California families), being an English learner, and qualifying for reduced price lunch.

Therefore, to get a better understanding of the data one needs to perform a multiple regression of the test scores against those three variables associated with lower income districts combined with the average district income. This regression line is whereand When the multiple regression is done the R2= 0. 80 and the multiple R= 0. It should be noted that, given a lack of dramatic significance changes with the multiple regression above, we concluded taking the partial derivatives, which requires that all else be held constant, is valid.