Bloom’s 2-Sigma

Interactive Teaching and Active Learning
Best Practices for Teaching and Learning

Benjamin Bloom did seminal work on assessing the effectiveness of different classroom teaching strategies. In this study, he had three groups of instruction. In the first group, called conventional learning, there was one teacher for 30 students. In this group, regular tests were given and feedback on student performance was provided to the students.

In the second group, called mastery learning, there was also one teacher for 30 students. In addition, the teacher was often the same teacher as in the first group. The only difference in the Mastery Learning group was that feedback given on tests was followed by corrective procedures, and another test was given to make sure that students mastered the subject matter.

In the third group, called the tutorial group, there was one teacher for one student. The teacher is sometimes called a tutor. It's important to point out that the students weren't receiving extra instruction, but rather, they were working directly with one teacher to learn the material. In this group, students learned the subject matter with a good teacher. They were given regular tests with the same feedback and corrective procedures as in the Mastery Learning group.

Following instruction in each of these learning groups, Bloom then assessed how well students in each group performed on a specific summative assessment. The x-axis of this graph represents the summative achievement scores, and the y-axis represents the number of students.

When Bloom analyzed the scores of the students, he found that they received a wide range of scores that followed a typical bell curve distribution. Bloom found that the average student in the mastery learning group performed better on the final assessment test than the average student in the conventional learning group. Benjamin Bloom found that the average scores of the students in the mastery learning group were one standard deviation above those of the conventional group.

When Bloom analyzed the achievement scores of the students in the one-on-one tutorial learning group, he found that the average student in the one-on-one learning group performed even better than the average student in either the conventional or mastery learning groups. In fact, the average student in the one-on-one tutorial learning group performed two standard deviations above the average student in the conventional learning group. Even more astounding is that the average student in the one-on-one learning group performed above 98% of the students in the conventional learning group.

The most striking result of Bloom's data is that most students have the potential to reach a high level of learning when they learn in a one-on-one instruction method. Bloom then focused his attention on finding other strategies that could mimic the striking two-sigma effect of one-on-one teaching for group instruction settings.

Now we'll have a brainstorming session on why one-on-one teaching is so effective. Why do you think that one-on-one teaching is so effective? Pause the video here while you brainstorm a few ideas.

Here is a brief list of the reasons that you may have come up with. One-on-one teaching is so effective because the teacher can provide instruction that is perfectly tailored to the student's needs. The teacher can gauge the student's understanding of the material and ask questions to the student to guide the student's learning process. The teacher can provide a safe learning environment in which the student feels comfortable and able to ask many questions. In addition, the teacher can provide immediate feedback to the student, which ensures that any misconceptions are corrected before continuing with the lesson.

This brings up the question of, why can't we tutor everyone? It's important to understand that one-on-one teaching methods are expensive, lack social interaction with peers, and the quality of instruction can vary widely depending on the teacher's abilities.

For the rest of this session, we will talk about how we can mimic aspects of one-on-one teaching in a classroom setting to increase retention and transfer of knowledge.