

# Frequency distributions



Situation Imagine that you can predict the scores on the Tests for Understanding in this In Week there was a bimodal distribution. In Week 2, there was a positive skew. In Week 3, there was a normal distribution. In Week 4, there was a negative skew. Questions: 1. What do these different scores tell you about the tests in Weeks 1, 2, 3, and 4? What is happening to the students' scores over time? From the given distributions, one can say that there is a distinct change in the pattern of student's scores on understanding over the three weeks. Initially, there was a bimodal distribution, showing that students were grouped into those that understood better (scores that clustered around the top of the scale) and those that did not understand as well (scores clustering near the lower end of the scale). By the second week, the two groups of students did combine into one unified group; but the majority still did have trouble grasping the concepts in class. A minority of students did far better than the rest and got high score; while the majority still scored towards the lower side of the scale. Scores from the third week show that the class as a whole was starting to make sense of the concepts being taught, and were improving in their understanding. This can be understood from the movement of the majority of the scores from below the 50% mark to very close to the 50% scores point. By now, about half the class understood the concepts reasonably well, scoring above average, and only half the class was struggling and scoring less than average on understanding the concepts. This trend again changed in week 4; where a negative skew showed that now a majority of students had caught up with the concepts being taught in class; and only a minority was still scoring low on the scale while the majority was scoring towards the higher side. It can be seen that the average score on understanding of the students consistently

climbed up the scale from weeks 2 till 4; showing that the trend was towards more and more students gaining understanding as time passed; regardless of their previous performance.

2. What type of distribution would the instructor most want to see if the best result is that most students earn an average score? With most students getting an average score; the instructor would prefer to see a normally distributed set of scores since this would mean that at least 50% of the students do score at and above the average score, and many others score just below average. When scores are normally distributed; it means that while there are very few high scorers; there are also very few low scorers. The aim of any instructor is to promote understanding amongst maximum number of students; and thus, a normal distribution would be the distribution the instructor would prefer if a majority of students were to get average scores.

3. What type of distribution would the students like to see in order to be most likely to earn a good grade? Students would most prefer the distribution to be negatively skewed as much as possible. When a distribution is negatively skewed, it means that a majority of cases lie towards the top of the scale – in this case meaning that a majority will score more than 50%. The average score in a negatively skewed distribution is at the higher end of the scale; showing that even the ‘average’ scorer in the set has a high score on the scale. Thus, students would prefer the distribution of scores to be negatively skewed because this would mean that a majority of them score high on the scale, and very few score low.