

Descriptive Statistics in Excel: An Articulate Rise Microlesson

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1. Anticipatory Set

Microlearning Lesson Plan

Focus students	The focus students are high school juniors and seniors who have completed two or more semesters of Algebra. The objectives are: To teach the learner the basic definitions and uses of descriptive statistics. Also, to teach the learner how to calculate descriptive statistics in Excel. The purpose is to establish statistical literacy and problem-solving skills for the learner. Transfer of learning will be applied to the learner directly by replicating the tasks that are taught in Excel.
State objective/goal (limit to 1 or 2)	
Establish 1. Anticipatory Set	
Focus students	
State objective/goal (limit to 1 or 2)	
Establish purpose	
Establish transfer	
Establish transfer	

List the mode of instruction.	The mode of instruction will be an online asynchronous microlesson. The software will be Articulate Rise and Excel. The concepts will be the mean, median, and mode. The definitions are as follows: The mean is the average of all the values.
List the software used.	
Provide information	
Explain concept	
State definitions	The median is the middle value of the data set. And the mode is the most repeated value. Other topics, such as outliers, normal distribution, measures of variability, and symmetry, will be addressed. The critical attributes are as follows: The mean is useful when the distribution is symmetrical. The median is better for a skewed distribution. The mode is useful for categorical data.
Identify critical attributes	
Provide examples	
Model	
Check for understanding	
Pose key questions	
Ask students to explain concept, definitions, attributes in their own words	An example would be calculating the mean, median, and mode, along with other descriptive statistics in Excel, and showing it in a video for the class. The model is as follows: Explain key concepts such as the mean, median, mode, outliers, normal distribution, symmetry, and measures of variability (2 minutes). Watch a few videos on calculating the mean, median, mode, and other descriptive statistics (2 minutes). Have an assessment at the end of each page with a few quiz questions (1 minute). The lesson will have a variety of questions on the mean, median, mode, and other topics. What are the mean, median, and mode? How do you calculate each one? The students will explain the various examples. And they will generate them on their own. The active participation will be a downloadable Excel file, which the student will follow within the lesson.
Have students discriminate between examples and non-examples	
Encourage students to generate their own examples	
Use active participation devices	

3. Guided Practice

Microlearning Lesson Plan

Initiate practice activities which are under direct supervision

Elicit overt response that demonstrates behavior in objective

Continue to check for understanding

Provide immediate and specific knowledge of results
Provide direct, close monitoring by teacher

The first instructional strategy will be Direct Instruction. The students will start with directed practice and then guided practice. The student will download an Excel file and watch it along with a video. The problems will be completed in real-time. The mean, median, mode, and other statistics will be calculated using a data set from Kaggle. The first example will be mathematics test scores for primary students. The mean, median, and mode will be compared to ensure that the distribution of the data is normal. The class will also need to calculate the standard deviation and variance. Students will work along with the video. Questions will be answered by email in a timely manner.

4. Closure

Microlearning Lesson Plan

Make final assessment to determine if students have met objective

Have each student perform behavior on his/her own
Final check for teacher's next lesson

The final assessment will be multiple-choice quiz questions at the end of each page that asks basic questions on descriptive statistics. Also, there will be a critical reflection at the end of the page to compare and contrast the various topics. There will also be a homework assignment to complete, which will be a downloadable Excel file.

5. Independent Practice:

Microlearning Lesson Plan

Students continue to practice on their own for:

Speed/fluency from newly learned skills

Maintenance for previously learned skills

How have you included UDL practices into your lesson plan?

The next step of Direct Instruction is independent practice. The students will be given a second part to complete for homework in the dataset. A data set in Excel will be used. They are expected to do the calculations on their own. The Independent problems will be more challenging than the original guided practice problems. This challenge will foster critical thinking skills.

The UDL Principle used for this lesson will be Engagement. Students will be engaged with guided practice because the learners will have active participation. Students will also be engaged with independent practice because they will have autonomy. Compare and Contrast will foster engagement by being relevant and sparking the students' interest. Students who suffer from motivational difficulties will benefit from increased engagement.

6. Instructional Strategies:

Microlearning Lesson Plan

Direct Instruction
Compare and Contrast

The two instructional strategies will be Direct Instruction and Compare and Contrast. Direct instruction was already mentioned above using modeling, guided practice, direct practice, assessment, and independent practice. Compare and Contrast will be used to compare the different descriptive statistics, such as mean, median, and mode. The students will also compare measures of center to measures of variability. The student will first be able to identify them on their own. Afterward, the student will come up with examples. Lastly, the student will compare each one and recite the differences.