

## This is the prompt:

my subject is statistics and the topic is central tendency, the threshold concept is CENTRAL TENDENCY, what students know- meaning of mean and average hieght/age of class ,use of formula, what students dont know-exact formulas to calculate averages using the underlying principles such as- 3. Rigidly defined,4. Capable of further algebraic treatment,5. Least affected by extreme values,6. Sampling stability. Generate case study using Bloom, Fink and SOLO. Build a comparison table on how they differ from each other.

### ✓ 1. Case Study: Teaching Central Tendency Using Bloom's, Fink's, and SOLO Taxonomy

🎯 **Topic: Central Tendency**

🧠 **Threshold Concept: Understanding Central Tendency beyond formulas**

📊 **What students know:**

- Basic idea of average (e.g., mean age/height of class)
- Use of simple formula for arithmetic mean

? **What students don't know:**

- Conceptual foundations and principles behind good measures of central tendency:
  - **Rigidly defined**
  - **Capable of further algebraic treatment**
  - **Least affected by extreme values**
  - **Sampling stability**

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### 🔍 Case Study: Understanding Central Tendency (Mean, Median, Mode) with Conceptual Foundations

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#### Bloom's Taxonomy-Based Lesson Flow

**Level**

**Activity**

**Remember** Define mean, median, and mode. Recall formulas.

<b>Understand</b>	Interpret each measure using classroom data (e.g., average height). Explain how outliers affect mean.
<b>Apply</b>	Calculate mean, median, and mode from class test scores with and without extreme values.
<b>Analyze</b>	Compare results of the three measures and identify which is most suitable for different datasets.
<b>Evaluate</b>	Assess which average is most representative and why based on properties like stability and resistance to outliers.
<b>Create</b>	Design a mini-research (e.g., survey classmates) to gather data, apply all three measures, and argue the best central tendency measure to report findings.

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### Fink's Taxonomy-Based Lesson Flow

<b>Dimension</b>	<b>Activity</b>
<b>Foundational Knowledge</b>	Explain formulas and meaning of central tendency measures.
<b>Application</b>	Use class data to compute different averages and graph them.
<b>Integration</b>	Connect statistical averages to real-world situations (e.g., salaries, cricket scores).
<b>Human Dimension</b>	Reflect on how misuse of averages can misrepresent people/data (e.g., mean income hiding poverty).
<b>Caring</b>	Appreciate ethical data representation and fairness in reporting.
<b>Learning How to Learn</b>	Encourage metacognition: "Which average should I use and why?"

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### SOLO Taxonomy-Based Lesson Flow

<b>Level</b>	<b>Activity</b>
<b>Pre-structural</b>	Student attempts formula-based problems without understanding differences in average types.
<b>Uni-structural</b>	Student can define each type of average and calculate simple examples.
<b>Multi-structural</b>	Student calculates all three averages but does not yet compare or evaluate them.

<b>Relational</b>	Student understands and explains when and why one average is more appropriate than another (e.g., median for skewed data).
<b>Extended Abstract</b>	Student applies the concept to new contexts (e.g., comparing data for policy decisions) and critiques misuse of averages in media.

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## 2. Comparison Table: Bloom vs Fink vs SOLO for Teaching Central Tendency

Criteria	Bloom's Taxonomy	Fink's Taxonomy	SOLO Taxonomy
<b>Focus</b>	Hierarchical cognitive skills	Holistic learning (including affective, metacognitive, and human dimensions)	Depth of understanding and integration
<b>Structure</b>	Six levels: Remember → Create	Six dimensions (non-hierarchical)	Five levels: Pre-structural → Extended Abstract
<b>Strengths</b>	Easy to structure measurable learning objectives and assessments	Promotes deeper, transferable learning with values and ethics	Tracks the complexity and depth of learner's conceptual understanding
<b>Application in Central Tendency</b>	Ensures students can compute, analyze, and evaluate averages	Encourages students to connect averages to real life and think critically	Encourages conceptual progression from basic computation to critique and application
<b>Student Outcome</b>	Mastery of computational and analytical skills	Learner sees relevance, ethical dimension, and cross-disciplinary links	Deep understanding of when and how to use central tendency measures
<b>Assessment Focus</b>	Test questions, problem-solving	Reflection, application, real-world relevance	Rubrics to assess depth of understanding

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## 3. Summary Use in the Classroom

Using all three taxonomies:

- **Bloom** helps structure your lesson plan with measurable outcomes.
- **Fink** ensures the lesson is engaging and meaningful beyond technical computation.

- **SOLO** helps track students' conceptual progression.

This integrated approach transforms teaching Central Tendency from a formula-driven topic into one that:

- Encourages **deeper understanding** of when and why averages work.
- Teaches **ethical interpretation** of data.
- Helps students become **independent learners** of statistical reasoning

**Part 3: Generate the reflection questions for evaluation and write/ map to suitable learning outcomes.**

Reflection Question	Mapped Learning Outcome	Taxonomy
1. What is the difference between mean, median, and mode?	Recall and distinguish between types of averages.	Bloom – Remember, Understand
2. Why might the mean not be the best representation of a dataset?	Analyze the limitations of mean in presence of extreme values.	Bloom – Analyze SOLO – Relational
3. Can you give a real-world example where the median is more useful than the mean?	Apply conceptual understanding of central tendency to real-life problems.	Fink – Application, Integration SOLO – Extended Abstract
4. How do extreme values influence the choice of central tendency?	Evaluate the suitability of different averages in skewed data.	Bloom – Evaluate SOLO – Relational

5. How is the formula for mean rigidly defined, and why is that important?	Understand and explain the principle of being "rigidly defined" in statistical measures.	SOLO – Multi-structural to Relational
6. Why is it important that a central tendency measure is capable of algebraic treatment?	Describe mathematical advantages of the mean and their application.	Fink – Foundational Knowledge SOLO – Relational
7. In what situations is mode a better indicator than mean or median?	Apply knowledge to select the most relevant average depending on the context.	Bloom – Apply Fink – Application
8. How does the sampling stability of mean help in data analysis?	Explain the statistical robustness of central tendency measures.	SOLO – Relational Fink – Learning How to Learn
9. How does understanding central tendency impact your interpretation of news/media data?	Develop critical awareness of statistical misuse in communication.	Fink – Human Dimension, Caring
10. After today's class, how has your understanding of averages changed?	Reflect on the evolution of conceptual understanding and its practical implications.	Fink – Learning How to Learn SOLO – Extended Abstract