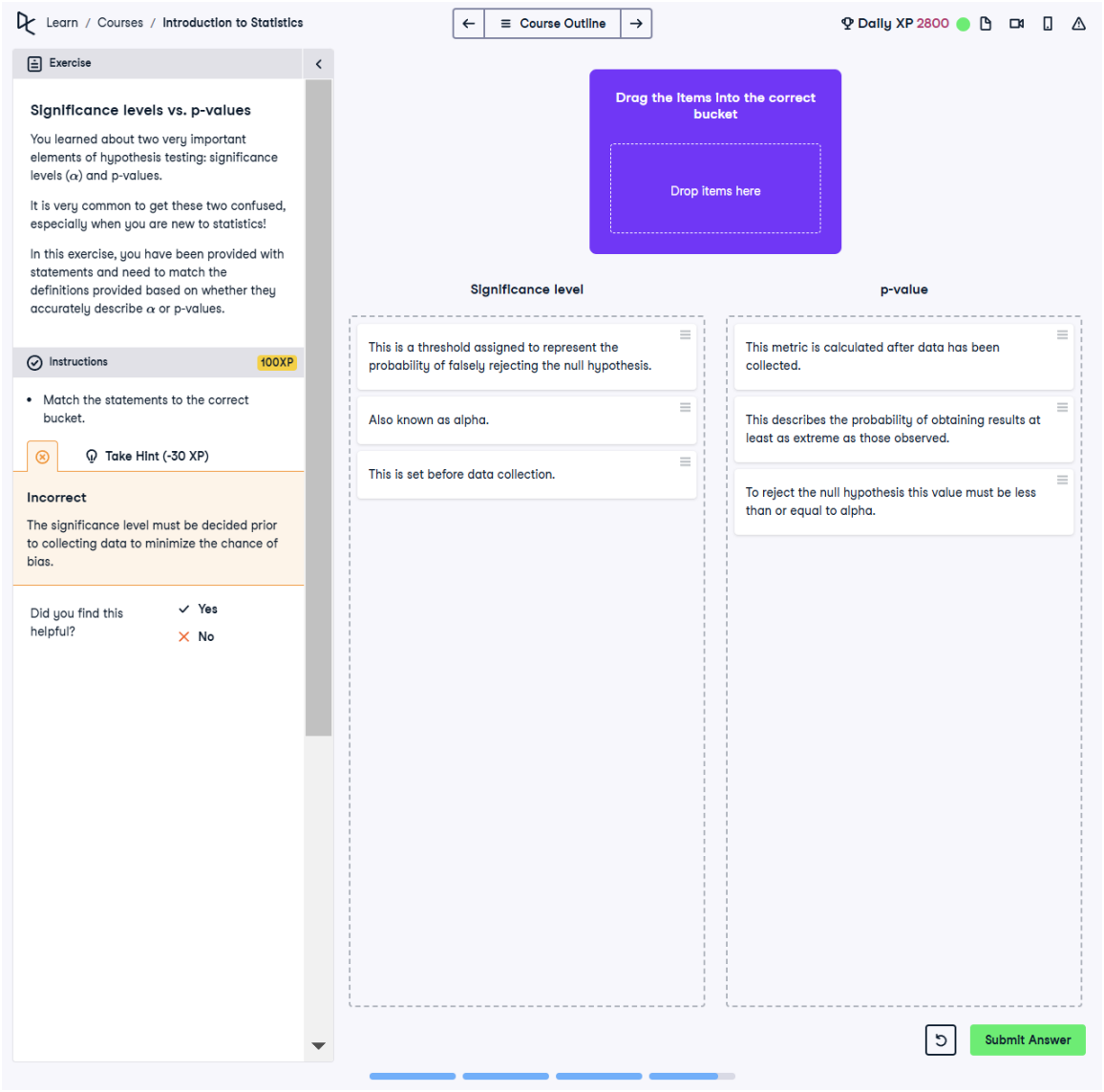
Significance Levels vs. p-Values

You learned about two very important elements of hypothesis testing: significance levels (α) and p-values.

It is very common to get these two confused, especially when you are new to statistics! In this exercise, you have been provided with statements and need to match the definitions provided based on whether they accurately describe α or p-values.



Answer

Significance level:

- This is a threshold assigned to represent the probability of falsely rejecting

the null hypothesis.
- Also known as alpha.
- This is set before data collection.

p-value:
- This metric is calculated after data has been collected.
- This describes the probability of obtaining results at least as extreme as those observed.
- To reject the null hypothesis, this value must be less than or equal to alpha.

Explanation of the Answer

1. **Significance Level (α):**
- This is a pre-determined threshold, set before data collection, that specifies how unlikely a result must be under the null hypothesis to reject it. Common values for α are 0.05 or 0.01.

2. **p-Value:**
- The p-value is calculated from the data collected and quantifies how extreme the observed data is under the assumption that the null hypothesis is true. A smaller p-value indicates stronger evidence against the null hypothesis.

3. **Relationship Between α and p-Value:**
- If the p-value is less than or equal to α, the null hypothesis is rejected; otherwise, it is not.