

The fragment of the lesson on the topic " Multiple regression: construction and model analysis" from the discipline "Econometrics" for students of the specialty "Mathematics" using a structured inquiry

### **Engage**

Students collaborate on the online mind mapping service:

Write the List of the main phase of the construction and research of the econometric model.

### **Explore**

Exercise. On the example of a specific economic problem, to construct an econometric model of multiple regression, namely: on the basis of the statistical data set in the task to determine the type of statistical dependence between the factor and the resultant variables and to calculate the values of the parameters of the model, check the adequacy and statistical significance of the econometric model of multiple regression.

No	Expenses on food	General expenses	Family composition
1	20	45	2
2	32	75	2
3	48	125	2
4	65	223	2
5	45	92	3
6	64	146	4
7	79	227	4
8	104	358	5
9	68	135	5
10	93	218	5
11	117	331	5
12	145	490	8
13	91	175	8
14	131	205	8
15	167	468	7
16	195	749	8

The questions list of teacher that corresponds to the main trajectory of the group's students' activity in studying the topic:

1. What first step should be in solving this task? Why?

2. Which of these indicators are factor and resultant variables? Why?

*Regulatory card "Explain Arguments"*

3. What are the peculiarities of the specification for the multifactor model?

*Regulatory card "Discuss with another student"*

3. How to implement the specification of the model in MS Excel?

4. How to calculate estimates of the coefficients of the linear model of multiple regression?

*Regulatory card "Explore yourself"*

5. Is it possible to provide economic content of the coefficients  $\hat{a}_i$ ? What characteristics are used for the economic interpretation of estimates in a multiple regression model?

*Regulatory card "Find a connection"*

*Regulatory card "Test Various Options"*

6. What kind of model will be?

7. What indicators should be calculated for the study of the built model?

*Regulatory card "Share Your Ideas"*

8. What indicators determine the adequacy of the built model?

*Regulatory card "Explore in a Group"*

9. What is the check for statistical significance?

10. State the purpose and features of the Fisher and Student criteria

11. What is the difference between using Fischer and Student's criteria?

*Regulatory card "Formulate the hypothesis"*

*Regulatory card "Check special case to confirm or refute the research hypothesis"*

### ***Explain***

Explain why the design and research of the model should occur according to a given algorithm.

*Regulatory card "Make generalization"*

*Regulatory card "Identify main research template"*

### ***Elaborate***

Can I use this algorithm to construct a model that describes the dependence on 5 factors? And if the sample of statistics is bigger (less), is it appropriate to use these tools?

*Regulatory card "Find more examples"*

### ***Evaluate***

Conducting an assessment in the form of answers to a question:

What did I learn after the lesson?

What will I want to know?

What questions did you have?