THE DEGREE OF IMPORTANCE OF THE SYSTEMATIC THINKING ABILITY IN IMPROVING THE DEGREE OF MATHEMATIC LITERACY OF PRIMARY SCHOOL PUPILS

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Abstract

In this article, it was scientifically and theoretically justified to what extent the ability of systematic thinking is important in improving the mathematical literacy of elementary school students. In addition, a mathematical model of the importance of systematic thinking ability in improving students' mathematical literacy was created, and the level of regression dependence (correlation coefficient) was checked using the pair-factor correlation model.

Keywords: Mathematical literacy, systematic, thinking, systematic thinking, factor, pair correlation, correlation, regression, correlational dependence, correlational analysis, significance.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

In the scientific research work carried out on the preparation of future primary school teachers for pedagogical activities based on international assessment programs and the implementation of international assessment studies, attention is paid to the levels of mastery such as natural literacy, mathematical literacy, reading literacy, global competence, financial literacy and creative thinking as an important object.

As a result of research conducted on the methodology of preparing future elementary school teachers for pedagogical activity based on international assessment programs and developing the logical, critical, creative-creative and cognitive thinking skills of elementary school students, it was observed that it is important to fulfill the following requirements:

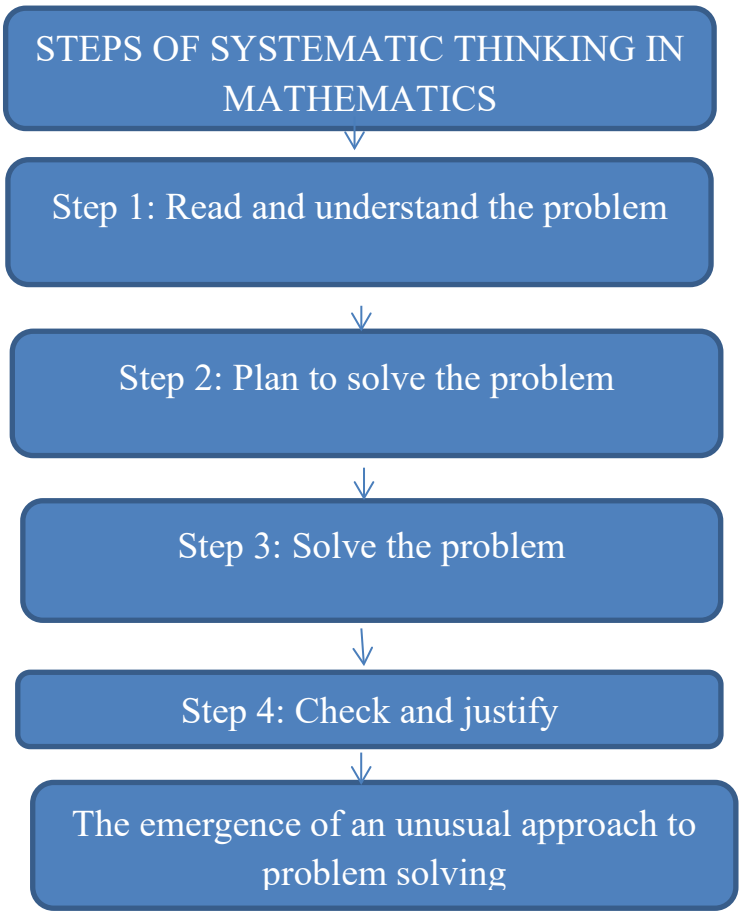
study of pedagogical possibilities of teaching primary education subjects based on international assessment programs and clarification of didactic requirements;

development of the methodology of using pedagogical principles based on international evaluation criteria in the preparation of didactic educational materials for primary education subjects;

preparing future primary school teachers for pedagogical activities based on international assessment programs, developing students' natural, mathematical, reading, global competence, financial and creative thinking literacy.

Systems thinking is a type of thinking that consists of a set of processes consisting of relationships of interrelated factors. This type of thinking is aimed at mastering the given problems in a complete or simplified form. It is aimed at solving the given problem based on understanding how it works and justifying its properties[1,2,3].

From a mathematical point of view, systematic thinking means dividing the problem into the following stages:



Stages of systematic thinking in mathematics

If the sequence of solving the problem set according to this scheme is not broken, students are considered to have the ability to think systematically.

At the 1st stage, the student consciously separates the condition and conclusion parts of the given problem. Determines which parameters are clear and which problem to solve. If a drawing is required in the matter, the drawing is drawn. In this case, the drawing should be clear and simple.

At the 2nd stage, the most optimal way to solve the problem is selected. To solve a given problem, it is determined which parameters need to be determined first and which bases (axioms, properties) are needed.

In the 3rd stage, the problem posed in this stage is systematically solved.

In step 4, the solution to the given problem is justified and verified.

The density of the relationship is expressed quantitatively by the value of correlation coefficients. The following formula is used to calculate the linear pedagogical correlation coefficient.

$$r_{yx} = \frac{\sum_{i=1}^{n}(x_i-\bar{x})(y_i-\bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i-\bar{x})^2 \sum_{i=1}^{n}(y_i-\bar{y})^2}} \quad (1)$$

The value of this pedagogical correlation coefficient takes values in the range $-1 < r_{yx} < 1$. Positive values of the pedagogical correlation coefficient indicate a direct relationship between pedagogical factors, and negative values indicate the existence of an inverse relationship between pedagogical factors. If the pedagogical correlation coefficient is equal to, $r_{yx} = \pm 1$ it will be possible to express it with a linear functional relationship.

Pedagogical correlation coefficient r_{yx} describes the relationship between pedagogical factors differently at different values [4,5].

1. If the value of the pedagogical correlation coefficient is in the range $-0,3 < r_{yx} < 0,3$ it is considered that there is almost no correlation between pedagogical factors.
2. If the value of the pedagogical correlation coefficient is in the range of $-0,5 < r_{yx} < -0,3$ and $0,3 < r_{yx} < 0,5$ it is considered that there is a weak correlation between pedagogical factors.
3. If the value of the pedagogical correlation coefficient is between $-0,7 < r_{yx} < -0,5$ and $0,5 < r_{yx} < 0,7$ it is considered that there is a correlation between pedagogical factors.
4. If the value of the pedagogical correlation coefficient is in the range $-1 < r_{yx} < -0,7$ $0,7 < r_{yx} < 1$ it is considered that there is a strong correlation between pedagogical factors [4,5]. The pedagogical correlation coefficient is analyzed and evaluated in terms of reliability.

In our article, for correlational analysis
X_i - "Systematic thinking" factor
Y_i - "Mathematical literacy"

The results of the experiment on students' ability to think systematically

Table 1

№	Mathematical literacy (number of students) Y_i	Number of students with systematic thinking skills X_i
1	**25**	3
2	**24**	2
3	**25**	2
4	**24**	4
5	**25**	6
6	**25**	4
7	**25**	3
8	**25**	4
9	**25**	4
10	**25**	5

Based on the data in Table 1, we check the density of the regression relationship between the pedagogical factors "Yi-mathematical literacy", "Xi- Systematic thinking" using formula (1) (correlation coefficient).

Here, $\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$ and $\bar{y} = \frac{\sum_{i=1}^{n} y_i}{n}$ if we calculate average values , $\bar{x}$=24,8; $\bar{y}$=3,7 originates.

We make the following table by performing calculations using the above expressions and Excel program.

Results of parameters calculation
Table 2

Y	X5	Y-Y'	X-X'	(X-X')(Y-Y')	(X-X')^2	(Y-Y')^2
25	3	0,2	-0,7	-0,14	0,49	0,04
24	2	-0,8	-1,7	1,36	2,89	0,64
25	2	0,2	-1,7	-0,34	2,89	0,04
24	4	-0,8	0,3	-0,24	0,09	0,64
25	6	0,2	2,3	0,46	5,29	0,04
25	4	0,2	0,3	0,06	0,09	0,04
25	3	0,2	-0,7	-0,14	0,49	0,04
25	4	0,2	0,3	0,06	0,09	0,04
25	4	0,2	0,3	0,06	0,09	0,04
25	5	0,2	1,3	0,26	1,69	0,04
248	37			1,4	14,1	1,6

Using the results of parameter calculation in Table 2, we calculate the correlation coefficient.

$$r_{yx} = \frac{1,4}{\sqrt{14,1 * 1,6}} = 0,294$$

It was observed that the value of the correlation coefficient calculated on the basis of the mentioned experimental results is equal to 0.294. If the value of the pedagogical correlation coefficient r_{yx} is in the range $-0,3 < r_{yx} < 0,3$ then it is concluded that the relationship between pedagogical factors is almost non-existent. Based on the value of this calculated correlation coefficient, it means that there is almost no correlation between mathematical literacy and systematic thinking factors.

REFERENCES

1. Ўзбекистон Республикаси Президентининг «Ўзбекистон Республикаси Халқ таълими тизимини 2030-йилгача ривожлантириш консепциясини тасдиқлаш тўғрисида» 2019-йил 29-апрелдаги ПФ-5712-сонли Фармони.
2. Ўзбекистон Республикаси Вазирлар Маҳкамасининг «Халқ таълими тизимида таълим сифатини баҳолаш соҳасидаги халқаро тадқиқотларни ташкил этиш чора-тадбирлари тўғрисида» 2018-йил 8-декабрдаги 997-сонли Қарори.
3. PISA–2021 Mathematics Framework (second draft), 46th meeting of the PISA Governing Board, 5-7 November 2018 Prague, Czech Republic.
4. В.Е.Гмурман Руководство к решению задач по теории вероятностей и математической статистике, М:., “Высщая школа» 1979 г., 400 стр.
5. B.Yu.Xodiyev, T.Sh.Shodiyev, B.B.Berkinov “Ekonometrika”, O‘quv qo‘llanma, T, TDIU bosmaxonasi, 2017, - 148 b.