

Lithuanian citizens' math education needs

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Citizens survey results

276 respondents have answered the survey questions in Lithuania. There is the statistics of survey results presented. In Table 1, Table 2, and Table 3 you can see the number of men and women who graduated from the last education institution, the year of their graduation and also the age of the respondents.

Table 1. „Gender“

Female	167
Male	109

Table 2. „When did you graduate from the last education institution?“

1-5 years ago	116
5-10 years ago	40
10-20 years ago	46
20 years ago	74

Table 3. „Age“

Younger than 18	4
18-25	66
26-30	56
31-40	70
41-50	36
51-60	26
61 and older	18

It is seen from the presented survey results, that women were more active in the survey. Most respondents graduated 1-5 years ago, considerable number of people, who participated in the survey, graduated 20 years ago.

In Table 4 and Table 5 you can see the occupations of the respondents.

Table 4. „Which one of the following best describes you?“

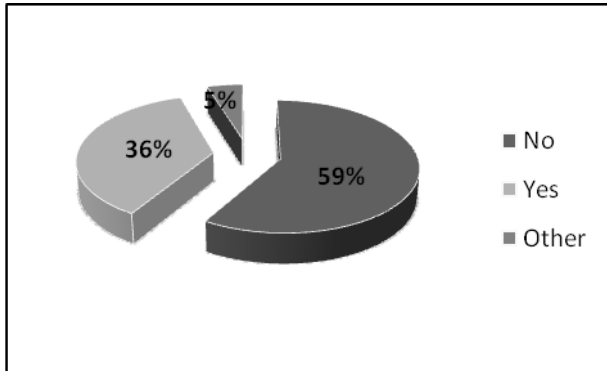
Employee	54,78%
Student	12,50%
Company / department manager	9,93%
Self-employed	8,09%
Unemployed	6,99%
Employer	5,51%
Housewife etc.	2,21%

Table 5. „What is your main field of expertise?“

Education	26,2%
Natural sciences	10,2%
Engineering	9,6%
Services, sales, business	9,1%
Computer science	9,1%
Public administration	8,0%
Social science	7,0%
Art/Humanities	5,9%
Other	4,8%
Technology	3,2%
Medicine	2,7%
Entrepreneurship	2,1%
Design	1,1%
Human resources	1,1%

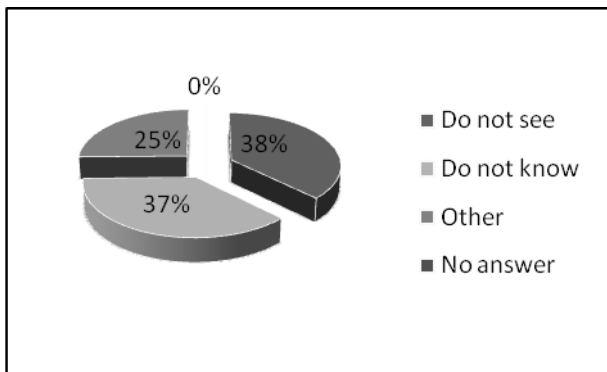
The statistics of the survey results is presented in Chart 1, Chart 2, Chart 3.

Chart 1. „Does math knowledge influence your everyday life?“



More than one third of respondents think, that mathematics knowledge influence their everyday life. More than a half of respondents (59%) do not think that mathematics knowledge influences their everyday life much. So, more than one third of people think, that mathematics is extremely important in their everyday life.

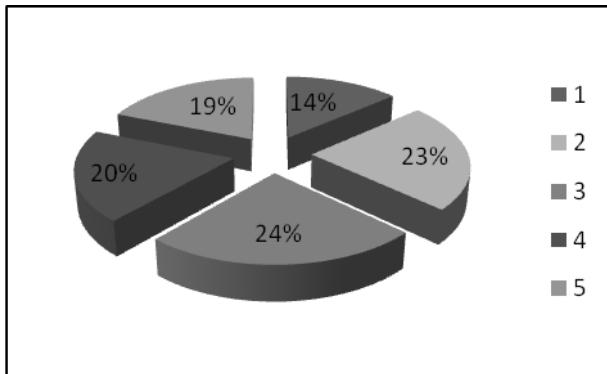
Chart 2. „Do you see needs in math knowledge in modern labour market conditions?“



More than one third of respondents are not sure that the need for learning mathematics is extremely important in the contemporary market conditions. Other third of respondents do not think that they need learning mathematics in the contemporary market conditions. So, quite enough people

do not think, that the need for learning mathematics in the contemporary market conditions is not extremely important. Such results can be explained by the fact that quite big number of unemployed people have participated in the survey.

Chart 3 „Please evaluate the role of math in your professional work in the scale from 1 to 5, where 1 - insignificant, 5 - very important“



Evaluating the role of mathematics in their professional work, bigger number of respondents think, that mathematics extremely influences their professional work - 39%. A little bit more than one third of respondents states, that the role of mathematics is not so important in their professional work.

The results of respondents' answers to the survey question „What do you think are the potential values of mathematics?“ are presented in Table 6, Table 7, Table 8, and Table 9.

Table 6. „Math develops thinking, helps to make a decision in a particular situation, find new ideas“

Strongly agree	83
Agree	114
Neither	30
Disagree	10

Strongly disagree	4
I don't know	8

Table 7. „Studying math develops logical thinking, accuracy and concreteness of future specialists“

Strongly agree	81
Agree	119
Neither	23
Disagree	13
Strongly disagree	5
I don't know	8

Table 8. „The knowledge and abilities of math, math thinking helped me to achieve more in my life“

Strongly agree	46
Agree	75
Neither	66
Disagree	46
Strongly disagree	13
I don't know	3

Table 9. „People, who understand mathematics well, are highly assessed by employers“

Strongly agree	33
Agree	77
Neither	67
Disagree	42
Strongly disagree	10
I don't know	20

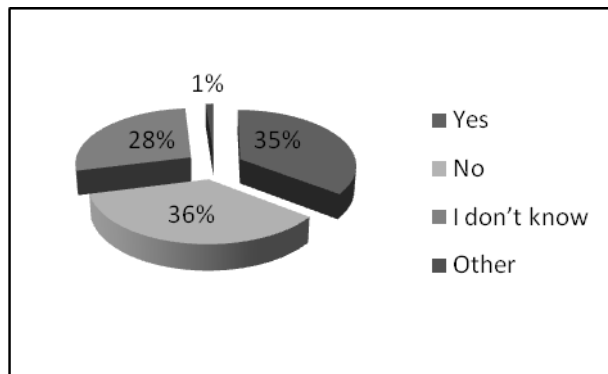
It is seen from the above presented results that mathematics helps to make a decision in a particular situation, find new ideas to the majority of respondents (79%).

Absolute majority think, that studying mathematics develops logical thinking, accuracy and concreteness of future specialists (80% of all responses). Half of people

participating in the survey (49%) state, that the knowledge and abilities of mathematics, mathematical thinking helped them to achieve more in their lives. Such results show that majority of people highly appreciate the importance and need of mathematics in their every day and professional lives. They think that mathematics is important; it helps to make a decision, find new ideas. It is seen from the Table 9 results that majority of people think that employees who understand mathematics well, are highly assessed by employers. It is interesting that respondents do not have opinion if employees who know mathematics are highly assessed by employers. We can do the presumption that such results are because of the fact, that quite big number of unemployed people participated in the survey, who are not sure what competences and knowledge are necessary for employees.

The statistics of survey answers is presented in Chart 4, Chart 5, Chart 6.

Chart 4. „Does the place you live in (or work) provide an opportunity to improve competence in math?“



The place people live in (or work) provide an opportunity to improve competence in mathematics for 35% respondents. „No“ for 36%, the answer „I don't know“ was chosen by

28% of respondents. It is seen that 65% of respondents do not have information how they can improve their competence in mathematics or the place they live in (or work) does not provide an opportunity to learn mathematics. So, we can state, that the need of mathematics for Lithuanian respondents is bigger than the possibilities.

Chart 5 „Would you like to improve your mathematics knowledge / skills?“

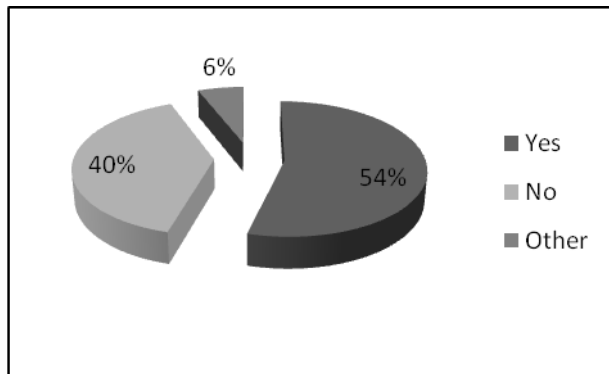
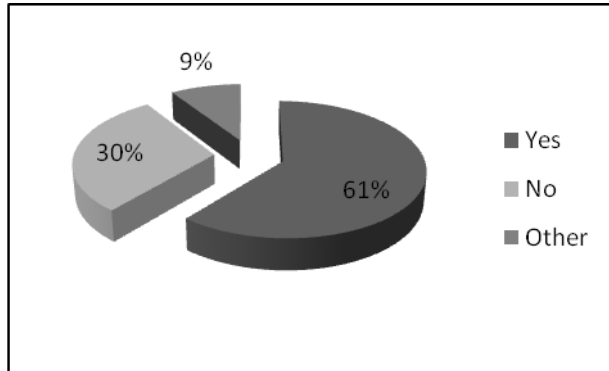


Chart 5 shows that approximately half of respondents (54%) would like to improve their mathematics knowledge and skills. 40% of respondents, who participated in the survey, think that they have enough mathematics knowledge and skills.

Chart 6 „If mathematics courses would be organized free of charge, do you agree to attend them?“



We see from Chart 6 if mathematics courses would be organized free of charge, 61% of respondents would like to improve their mathematics knowledge. So, if mathematics courses would be organized free of charge, there would be more people who would like to improve their mathematics competence. Quite big number of respondents wants to improve their mathematics knowledge and skills, but the place people live in does not provide an opportunity to do that.

The following are the ways suggested by the respondents how to improve the existing situation in order to improve their mathematics competence.

- continuing education courses at an affordable fee, these courses should be organized by the adult schools, colleges, high schools;
- mathematics competence development: compulsory examination for everyone;
- popularization of mathematics knowledge and skills: the articles on the popular electronic mass media, quizzes, where you can participate when resolving mathematics tasks;
- courses where you can prepare for retaking the state mathematics examination;
- training in adult education centres;

- to create attractive web pages, adding information to various social networks (Facebook, twitter)
- to organize training in the workplace, the state should finance mathematics courses for adults;
- to provide opportunities to learn mathematics remotely.

We present the survey results in Table 10 what knowledge is necessary for employers.

Table 10. “What knowledge of math are needed for the specialists of your field:”

Excel usage in the different calculations	20.2%
The tasks on the calculation of percentages, averages and/ or errors	17.6%
Approximate calculation	16.1%
The calculation of area and volume	11.0%
Graphical representation of the data and etc	8.4%
Market analysis - computing a demand and supply balance etc.	6.6%
Grouping of the data	6.2%
Statistical methods of the data analysis	3.3%
Estimation of statistical relations	2.9%
Probability theory	2.9%

We can see from the answers that the following are the most often indicated by the respondents: Excel usage in the different calculations (20,2%), The tasks on the calculation of percentages, averages and/ or errors (17,6%), Approximate calculation (16.1%).

The respondents also suggest the spheres of mathematics which they are interested in and make suggestions of what they would like to learn and what is not mentioned in the questionnaire:

- MS Excel for mathematics and statistical modelling;
- budget and financial calculations;

- household, management;
- higher mathematics course in some areas;
- interesting mathematics.

Employers survey results

According to Survey statistics, 31 employers have answered to the questions. 17 from them are working in the private company, 9 in state institution, 3 in public, Other - 2.

To the question „Please evaluate the mathematics knowledge level what is needed for your company/institution's employees“, according to 10 degree scale a little bit more than a half of respondents (58%) have chosen the answers from 7 to 10, that means, that they appreciate mathematics knowledge as extremely necessary for their company's employees.

Employers Survey answers are presented in Table 11, Table 12, and Table 13.

Table 11. „Employees make mistakes because of the lack of basic mathematical knowledge“

Strongly agree	9
Agree	13
Disagree	8
Strongly disagree	0
I don't know	1

Table 12. „You notice that your employees lack of mathematical skills“

Strongly agree	3
Agree	13
Disagree	13
Strongly disagree	2
I don't know	0

Table 13. When you take on a new employee you prefer graduates in science studies

Strongly agree	7
Agree	9
Disagree	7
Strongly disagree	6
I don't know	2

When analysing Table 11, Table 12, and Table 13 results, we can see, that majority of employers (71%) think, employees make mistakes because of the lack of basic mathematical knowledge (Table 11). Looking at the results of Table 12, we can see, that a half of employers (52%) notice, that their employees lack of mathematical skills. And the results in Table 13 show, that approximately a half of employers (51%) when giving a job to a new employee also prefer graduates in science studies. So, we can draw a conclusion, that the employers who participated in the survey, think that their employees lack mathematics knowledge, employers appreciate mathematics knowledge as important and approximately a half of them when giving a job to a new employee prefer graduates in science studies.

The results of the employers' answers to the survey question „In your opinion, how could be improved competence in mathematics? “are presented in Table 14 and Table 15.

Table 14. „I would like to collaborate with educational institutions providing services of math competence development for adults“

Strongly agree	2
Agree	20
Disagree	4
Strongly disagree	4
I don't know	1

Table 15. „I think there should be a network of educational institutions, offering adults the opportunity to learn math “

Strongly agree	8
Agree	16
Disagree	2
Strongly disagree	3
I don't know	2

We can see from Table 14 and Table 15, that majority (71%) of employers would like to collaborate with educational institutions providing services of mathematical competence development for adults. So, the majority of employers notice the lack of mathematics knowledge of their employees and they would like to change the existing situation collaborating with other institutions.

A little bit more employers (77%) emphasize, that there should be a network of educational institutions, offering adults the opportunity to learn mathematics. So, the network which would help to join educational institutions teaching mathematics is extremely necessary and important.

According to the survey results we can draw a conclusion that the majority of employers agree that their employees lack of mathematics knowledge and that their employees also make mistakes because of the lack of basic mathematical knowledge. Moreover, the majority of employers would collaborate with educational institutions offering adults the opportunity to learn mathematics in order to improve mathematics competence of their employees.