LEVINSKY College of Education
OVER 100 YEARS OF TEACHER EDUCATION

Part 2 in the webinar series “Moving Forward in the Midst of a Pandemic: International Lessons for Math Teachers”

Secondary-school mathematics: Looking ahead, an Israeli perspective

Talli Nachlieli

July 16th, 2020

levinsky.ac.il

Excellent Teaching = Levinsky College of Education

The National Academies of SCIENCES ENGINEERING MEDICINE

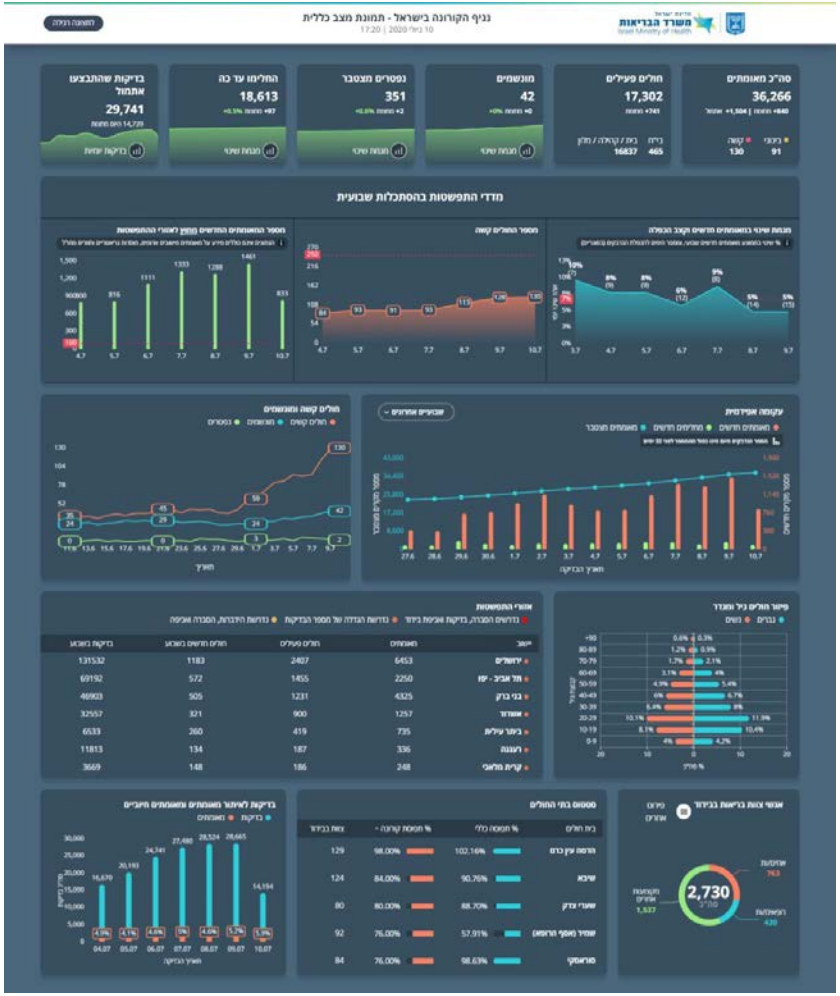
Who are you?

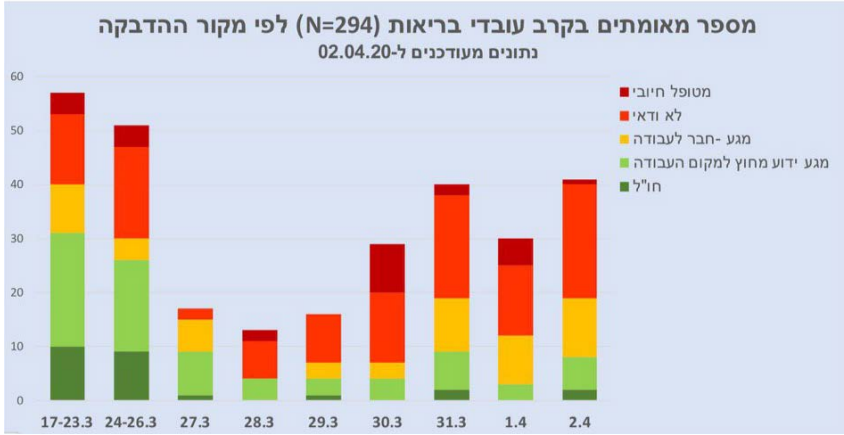
Where are you situated?

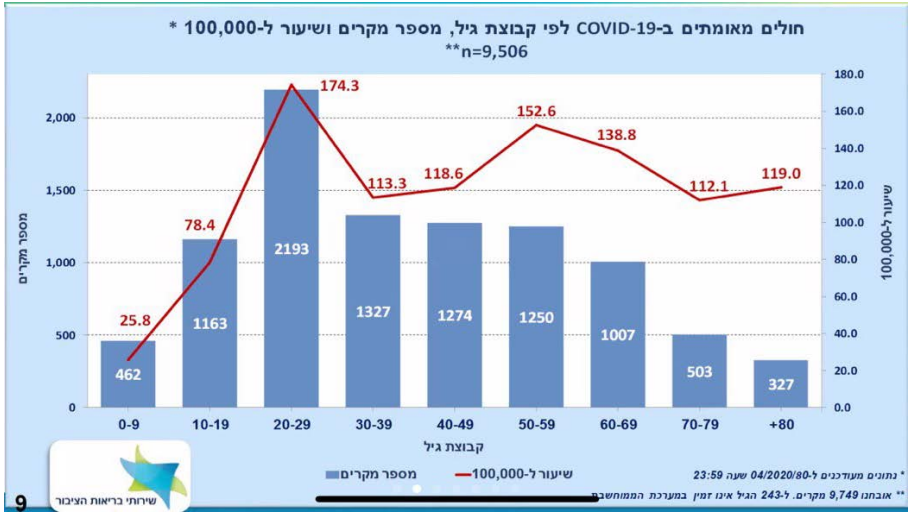
- Africa
- Asia
- Australia
- Europe
- North-America
- South-America

What do you do? Are you -

- A mathematics teacher in primary school
- A mathematics teacher in lower secondary school
- A mathematics teacher in upper secondary school
- A mathematics teacher in tertiary education
- A mathematician
- A mathematics education researcher
- A mathematics teacher educator
- A non-classroom-teacher school system employee
- Other


נגיף הקורונה בישראל - תמונת מצב כללית
משרד הבריאות
סה"כ מאומתים
36,266
חולים פעילים
17,302
מונשמים
42
נפטרים מצטבר
351
החלימו עד כה
18,613
בדיקות שהתבצעו אתמול
29,741
מדדי התפשטות בהסתכלות שבועית


מספר מאומתים בקרב עובדי בריאות (N=294) לפי מקור ההדבקה
נתונים מעודכנים ל-02.04.20
מטופל חיובי
לא ודאי
מגע -חבר לעבודה
מגע ידוע מחוץ למקום העבודה
חו"ל
17-23.3
24-26.3
27.3
28.3
29.3
30.3
31.3
1.4
2.4

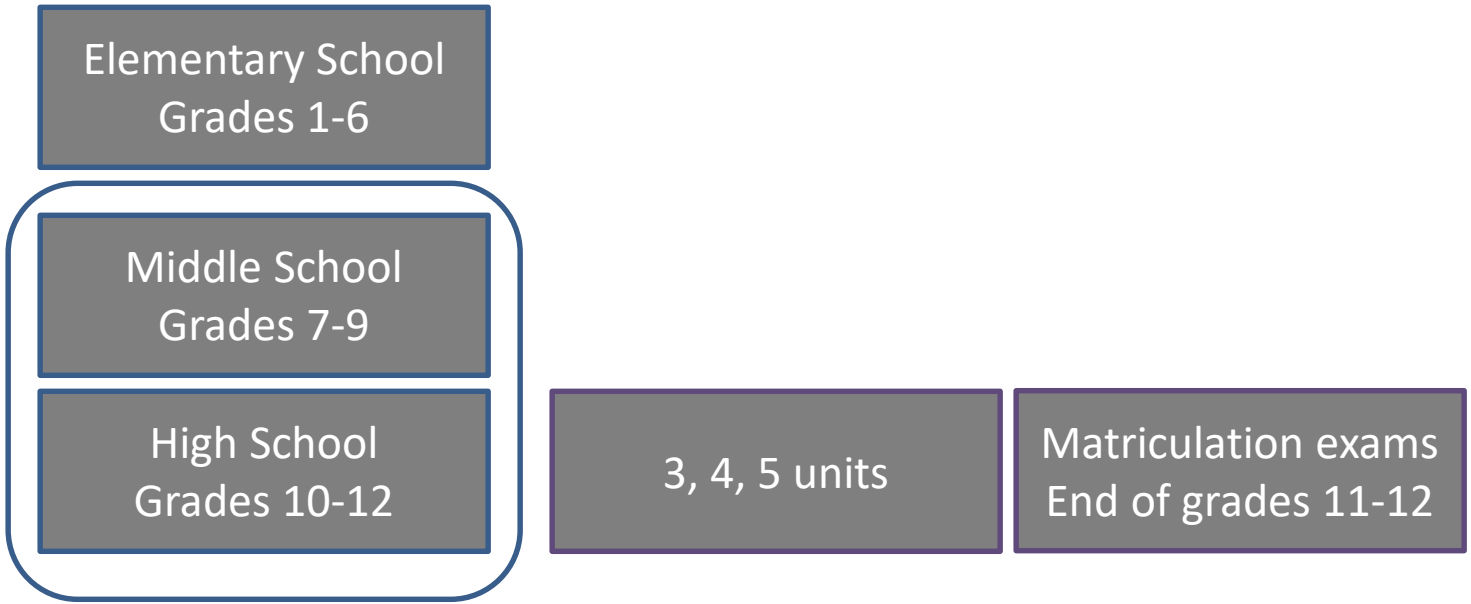

חולים מאומתים ב-COVID-19 לפי קבוצת גיל, מספר מקרים ושיעור ל-100,000 *
n=9,506**
174.3
78.4
25.8
113.3
118.6
152.6
138.8
112.1
119.0
462
1163
2193
1327
1274
1250
1007
503
327
0-9
10-19
20-29
30-39
40-49
50-59
60-69
70-79
+80
קבוצת גיל
מספר מקרים
שיעור ל-100,000
* נתונים מעודכנים ל-04/2020/80 שעה 23:59
** אובחנו 9,749 מקרים. ל-243 הגיל אינו זמין במערכת הממוחשבת

Plan

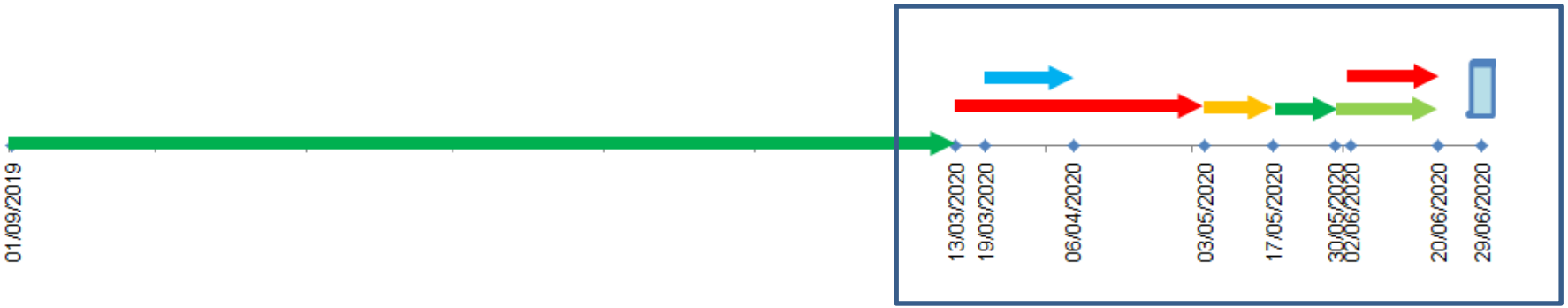
- Overview
- What do our secondary school mathematics teachers and students say about their teaching and learning experience during these past several months?
- Math in the Times of COVID-19: Preparing for 2021, facing the Future. Nerit Katz, Ministry of Education.
- What could and perhaps should be breached in our mathematics teaching?

Israeli education system

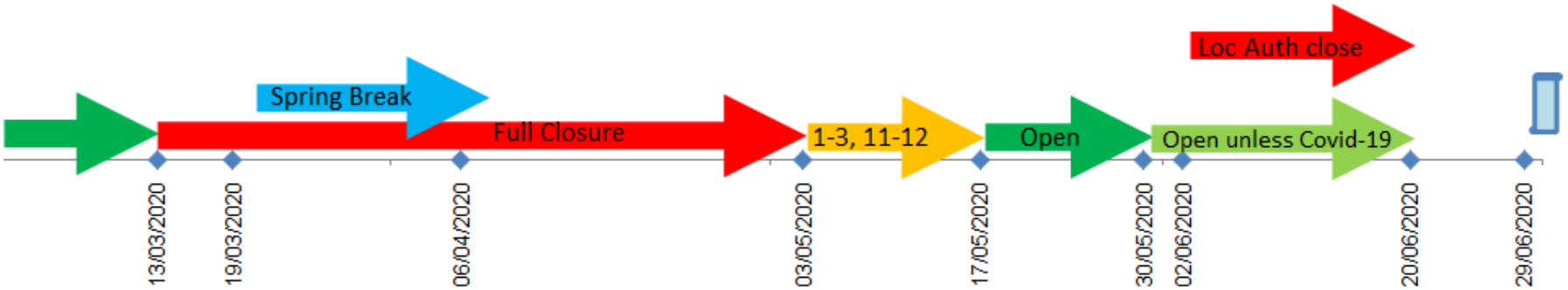
Overview



School year 2019-2020: Timeline



Timeline


Loc Auth close
Spring Break
Full Closure
1-3, 11-12
Open
Open unless Covid-19
13/03/2020
19/03/2020
06/04/2020
03/05/2020
17/05/2020
30/05/2020
02/06/2020
20/06/2020
29/06/2020

- April 9 – 16, 2020
- 505 secondary school students
  - 91% experienced distant learning

In which school subjects do you think it is important to invest today, for your future, despite difficulties of distant learning?

Mathematics (38%)

English (38%)

Computers (12%)

Others: less then (2%)

Research questions

- How did secondary school mathematics teachers experience distant teaching compared to classroom teaching?
- How did secondary school students experience distant mathematics learning compared to classroom learning?

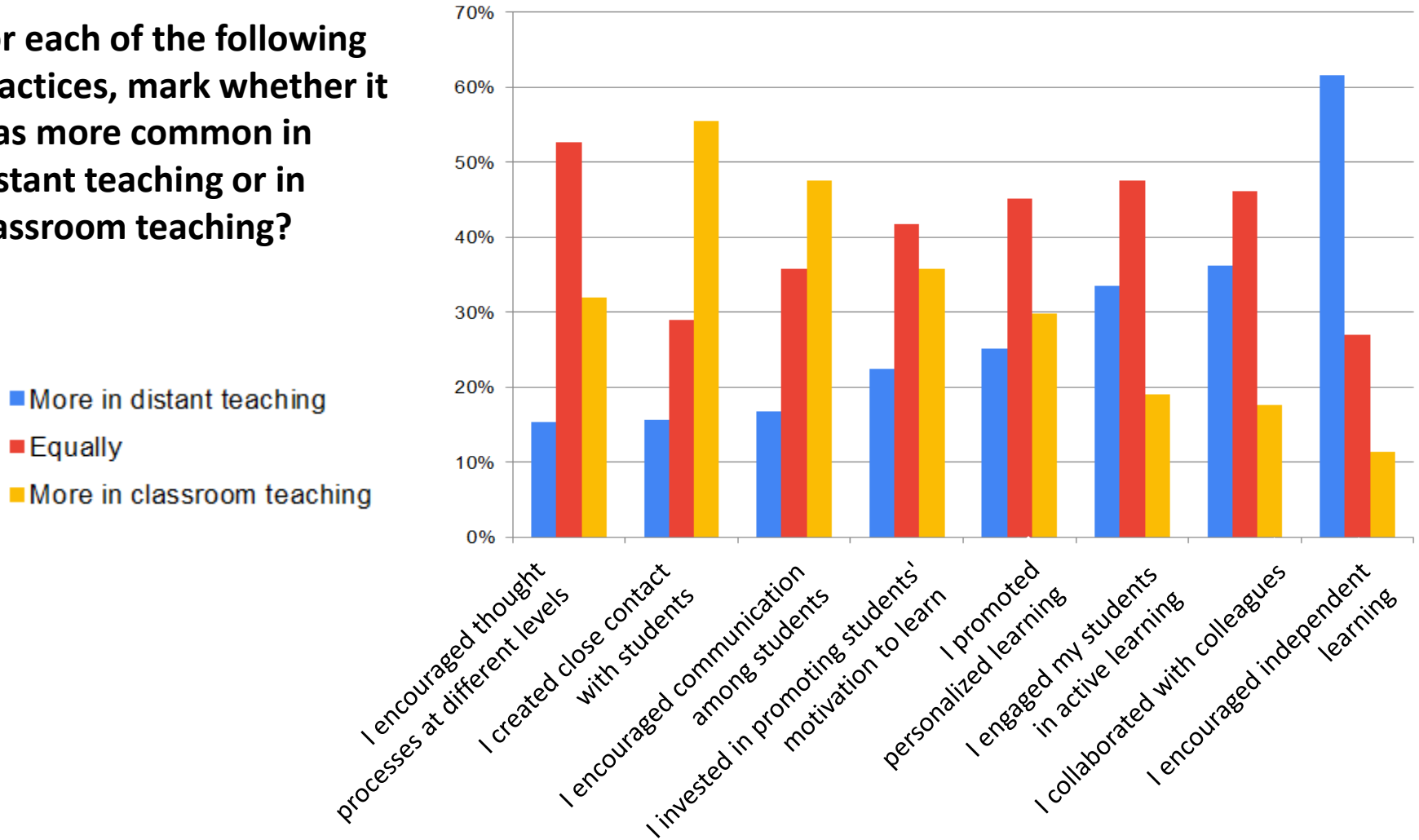
- July (summer break)
- 301 teachers
- 703 students

Teachers

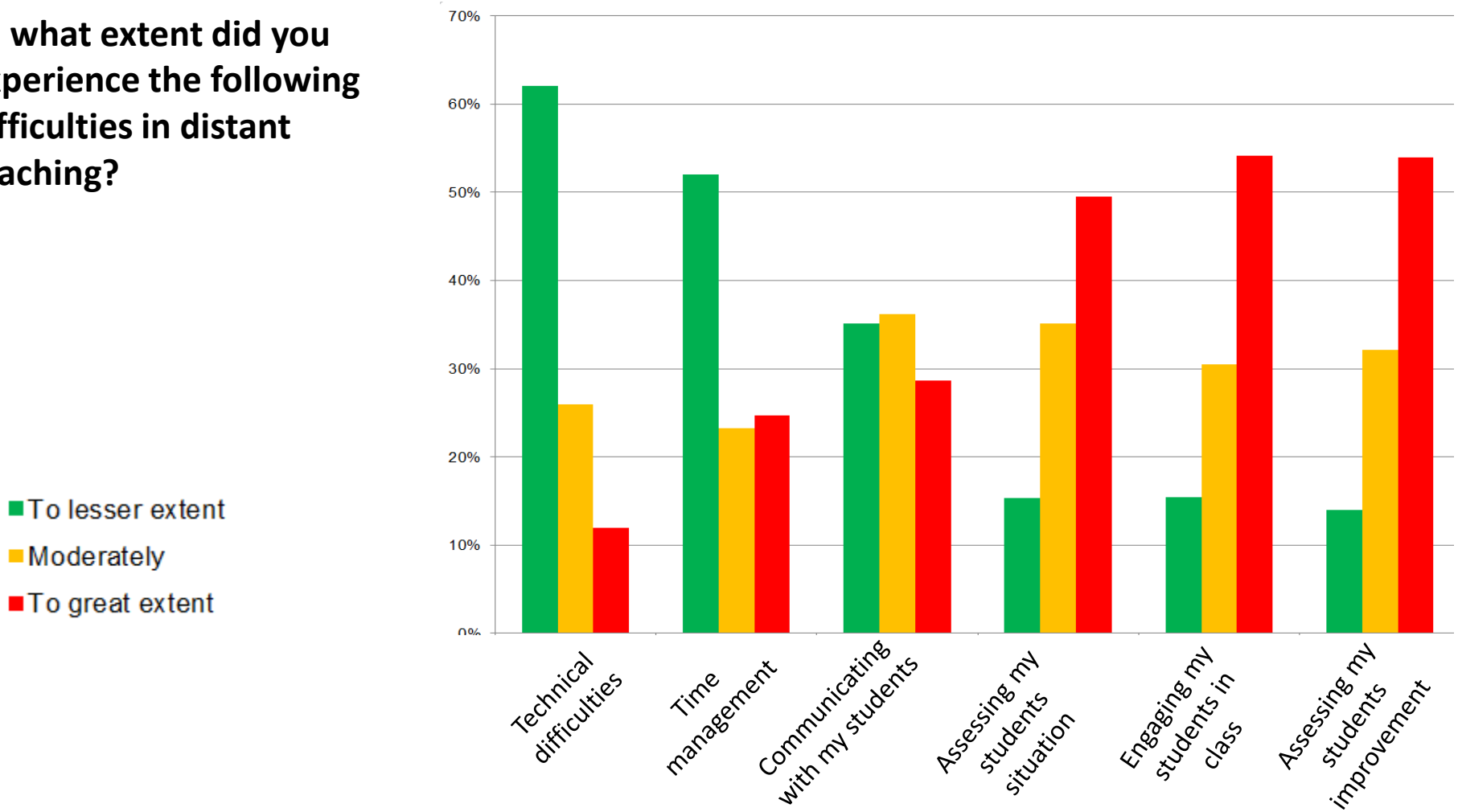
- **n = 301**
- **Female – 73%**
- **Male – 26%**
- **Other – 1%**

- **Middle school – 49%**
  grades 7-9
- **High school – 74%**
  grades 10-12

For each of the following practices, mark whether it was more common in distant teaching or in classroom teaching?

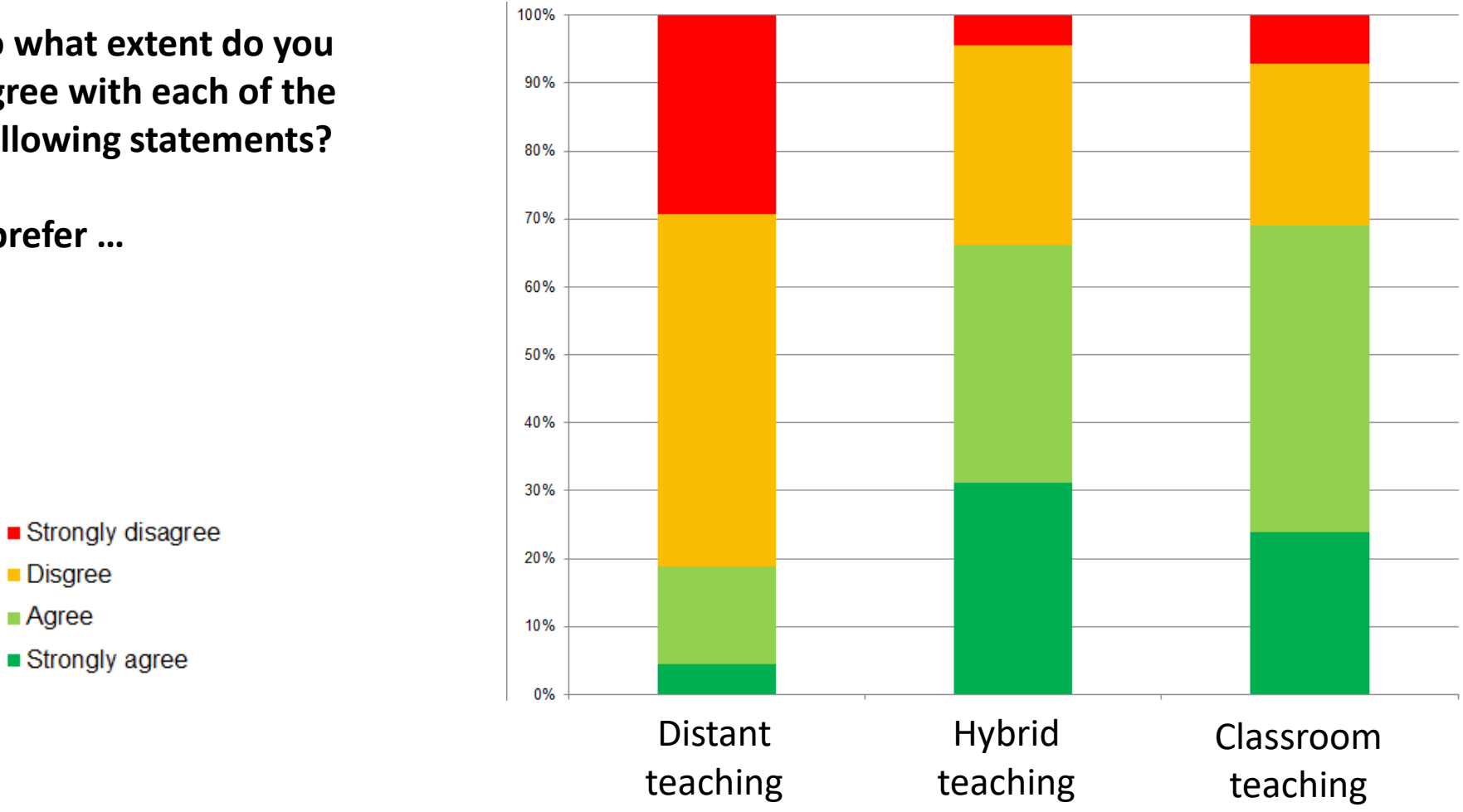


To what extent did you experience the following difficulties in distant teaching?



To what extent do you agree with each of the following statements?

I prefer …



Do you see any advantages in remote teaching and hybrid teaching for mathematics teaching? (n=230)

- “No. I teach at-risk-students. It is difficult to motivate them from afar.”
- “Many advantages. Advantage to promote students’ agency, to guide them in becoming more independent learners and assess their progress. Use technology to promote personalized learning”.

Next year it is possible that we would hybrid teach. What do you foresee that you change in your ordinary teaching to fit hybrid teaching? (n=228)

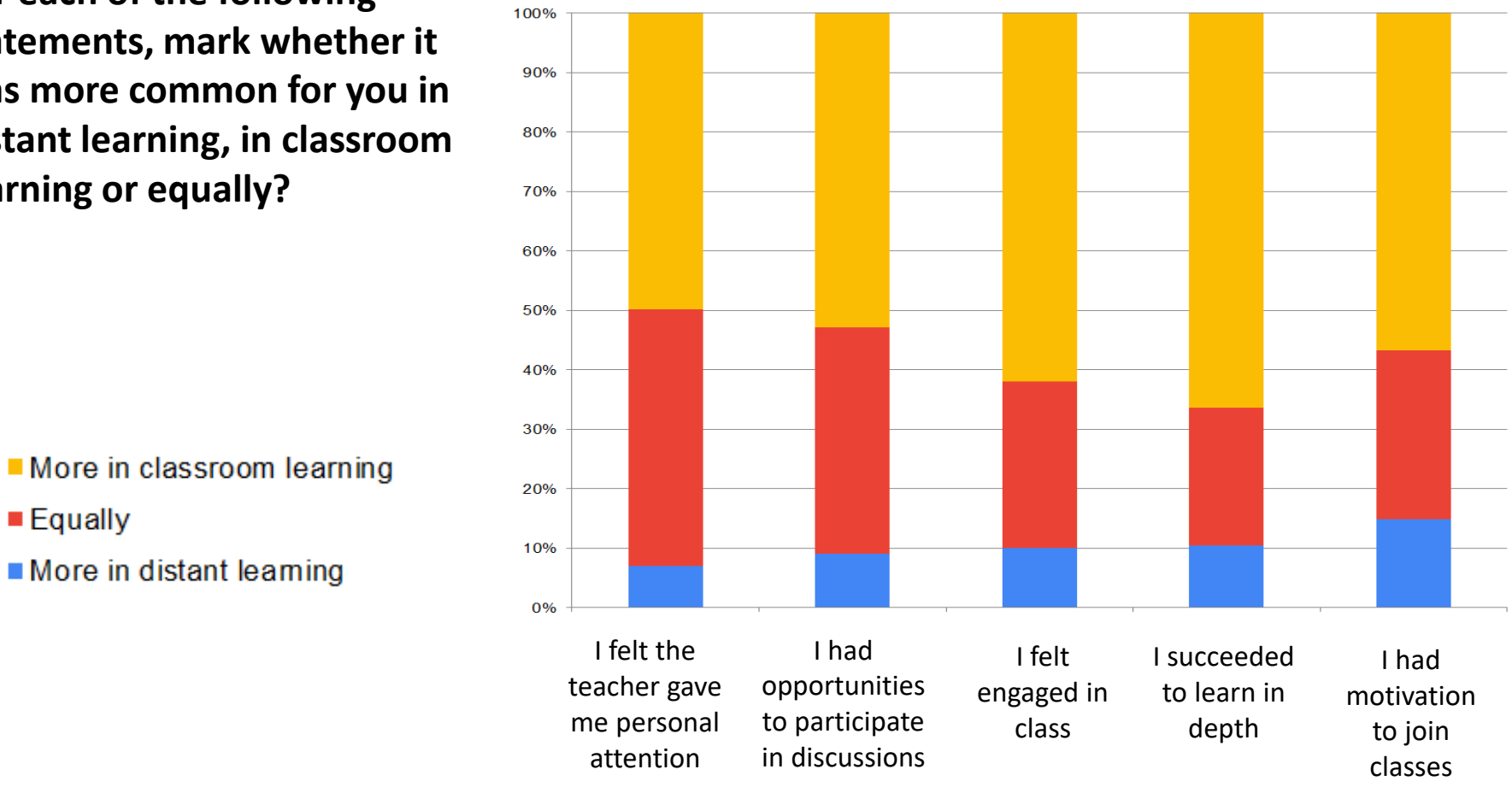
- “Variation in teaching practices to promote students’ personal learning, and practices that emphasize collaborative learning. of course – varied use of technology and variety of ways to assess students’ achievements that could be applied in classroom and distant teaching.”
- “More collaboration with other teachers”
- “Promote students’ motivation to learn from distance and in class”
- “Have more personal meetings with students and work with smaller groups.”

Students

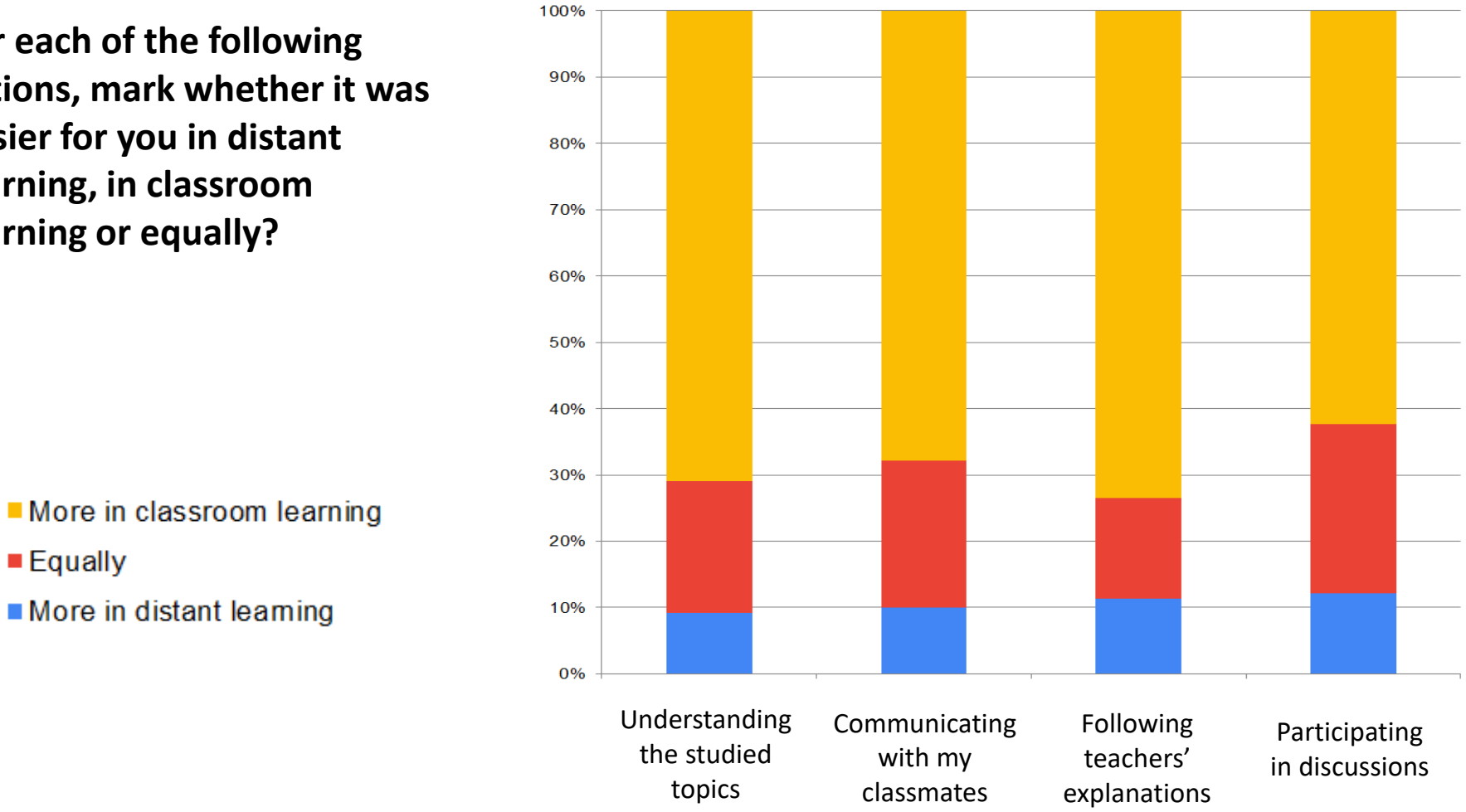
- **n = 703**
- **Female – 62%**
- **Male – 38%**

- **Middle school – 48%**
  grades 7-9
- **High school – 52%**
  grades 10-12

For each of the following statements, mark whether it was more common for you in distant learning, in classroom learning or equally?

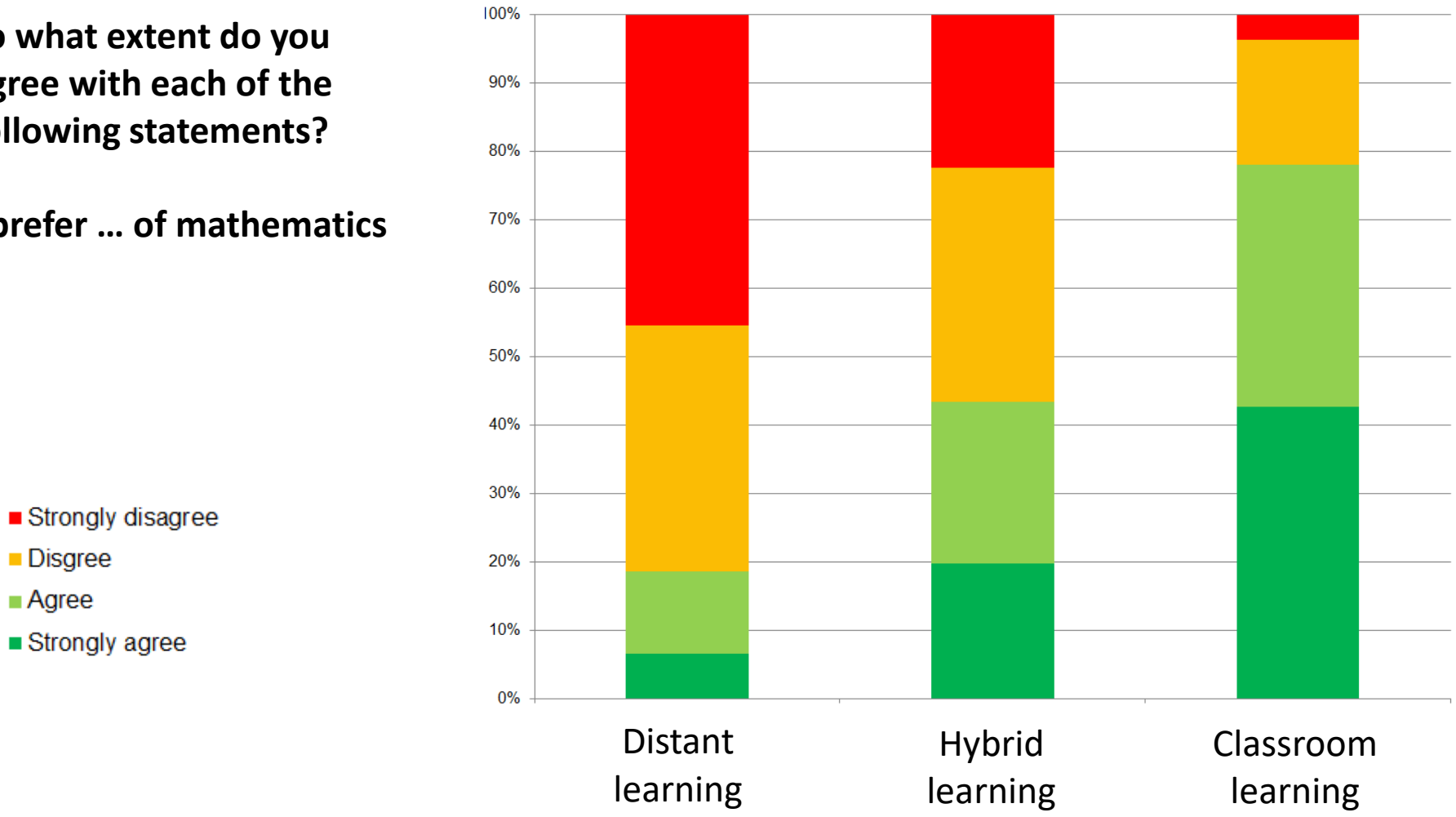


For each of the following actions, mark whether it was easier for you in distant learning, in classroom learning or equally?



To what extent do you agree with each of the following statements?

I prefer … of mathematics



Are there any advantages to distant learning?
If so, what are they?

"you can mute the class and actually listen to the teacher"

"…I did not understand the teacher in distant lear… in class, but still I prefer distant learning. The reas… subjects for which there is sufficient material on t… rather learn independently, at my own pace. But co…nparing distant learning in which students must be on-line in Zoom - to classroom learning, then distant learning has hardly any advantages … . the main one being the convenience of home and being able to concentrate quietly".

Don't do the same

Are there any advantages to distant learning?
If so, what are they?

“for strong students who already know the material at a good basic level (as is in my case) distant learning is better because practice could be personalized. I felt that I was focusing only on topics that are difficult for me and improving. My teacher was more accessible to me to answer specific questions on WhatsApp or Zoom. These explanations on specific questions were more helpful than going over everything.”

Which recommendations to distant teaching would you give your mathematics teacher to apply next year?

n = 357

- No (35%)
- Yes – no interruptions (24%)
- Yes – more convenient environment (19%)
- Yes – more personalized learning (11%)

Which recommendations to distant teaching would you give your mathematics teacher to apply next year?

n = 357

“Give more in-depth explanations and not videos from other sources. It’s difficult to learn that way”

“Small groups in Zoom meetings. You can hear the teacher better, get more attention from the teacher and more students participate”.

“Ask more and talk less”

“Engage students more. Allow asking questions, let students draw on the shared screen, have different channels for effective communication that addresses [students questions]…”

Which recommendations to distant teaching would you give your mathematics teacher to apply next year?

“When giving tasks, use rooms (Zoom) so that students could work on the tasks together”.

“Don’t teach too fast. Find a way to check with each student whether they understood the learned material”.

“Give more attention to students that need help. Make time for personal lessons.”

“make your lessons more interesting”

“Don’t teach like in class. Have more games, riddles”

Nerit Katz. Chief superintendent of secondary school mathematics, sciences division pedagogic secretariat, Ministry of Education

Math in the Times of COVID-19

Preparing for 2021
Facing the Future

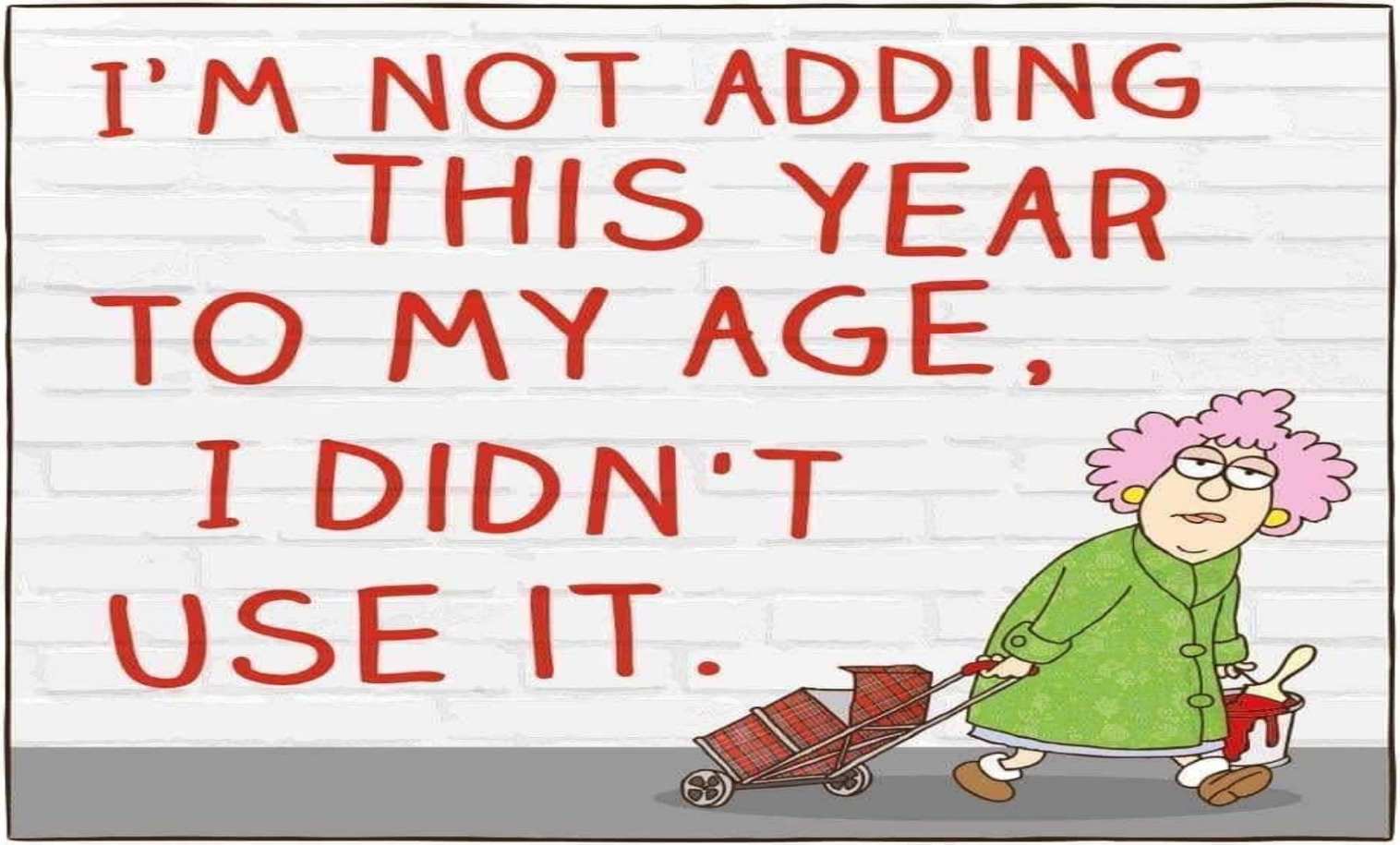
STATE OF ISRAEL
Ministry of Education

Table of Contents

Math in 2020

Math in 2020

- March 12th – all the schools in Israel closed
- May 17th – Grades 5-11 returned to classroom learning
- All the math teachers taught through distance learning
- The Ministry of Education recorded a tremendous amount of lessons to make the distance learning possible for students


I'M NOT ADDING THIS YEAR TO MY AGE, I DIDN'T USE IT.
© AUNTY ACID 2020
aunty acid

It’s not enough!!

If the teachers don’t know what the students know, we will not succeed

Close Far Plan

- At the onset of COVID-19 we wanted to create organized hybrid learning
- We focused on the strong 10th grade class
- We made a Private Public Social Partnership – the Ministry of Education, the Trump Foundation of Math, and two startups- Meta and Tailor ad
- We choose short topics (root function and probability)
- The program consisted of 8 units for each topic

What does the teaching unit include?

* Recommended:
2-3 teaching units per week

- Video lesson or presentation
- A link for the student's assignment
- The teacher receives a student assessment
- A meeting with the teacher based on the feedback received (as required)

A Unit (the teacher)

Video lesson \ zoom lesson \ presentation

Send a digital exercise

Data based teaching + conclusion

A Unit
(the student)

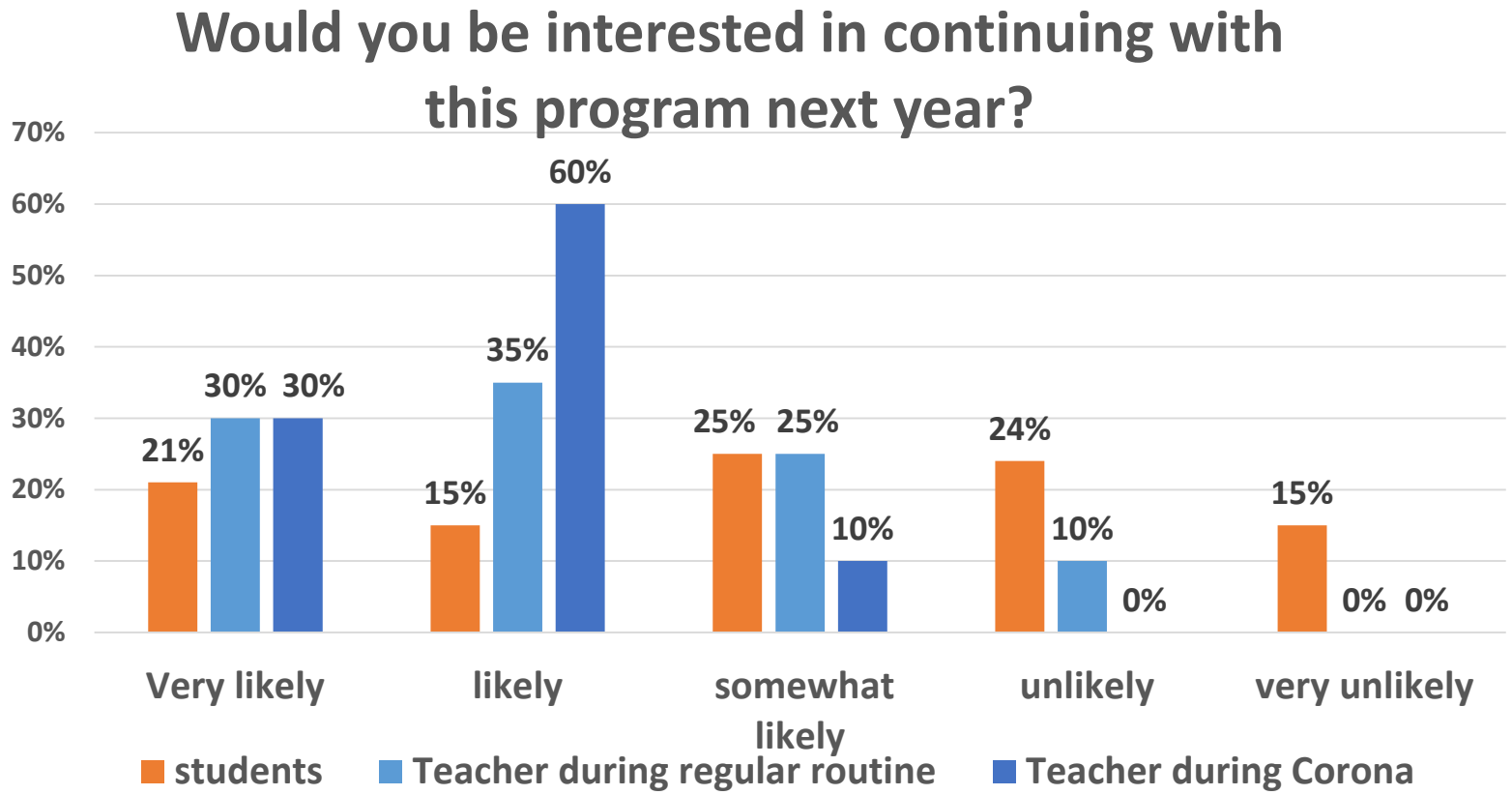
Video lesson\ presentation

Digital exercise

Review with the teacher if required

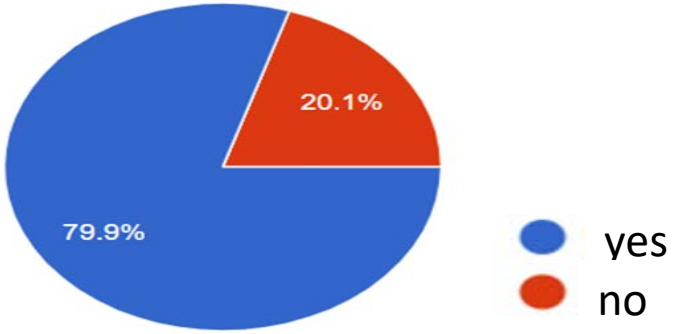
Feedback from the teachers & students

The teachers showed quite high satisfaction with the program



Feedback from the Teachers on the Far Close Program

- Teachers report students' competence in the studied material
- "When we returned to the classroom, students picked up from the point we finished in the Close Far Program"
- "When we returned to schools, kids continued to learn some of the lessons with the Far Close Program"



After returning to school, did you teach the subjects you taught during the Corona period again?

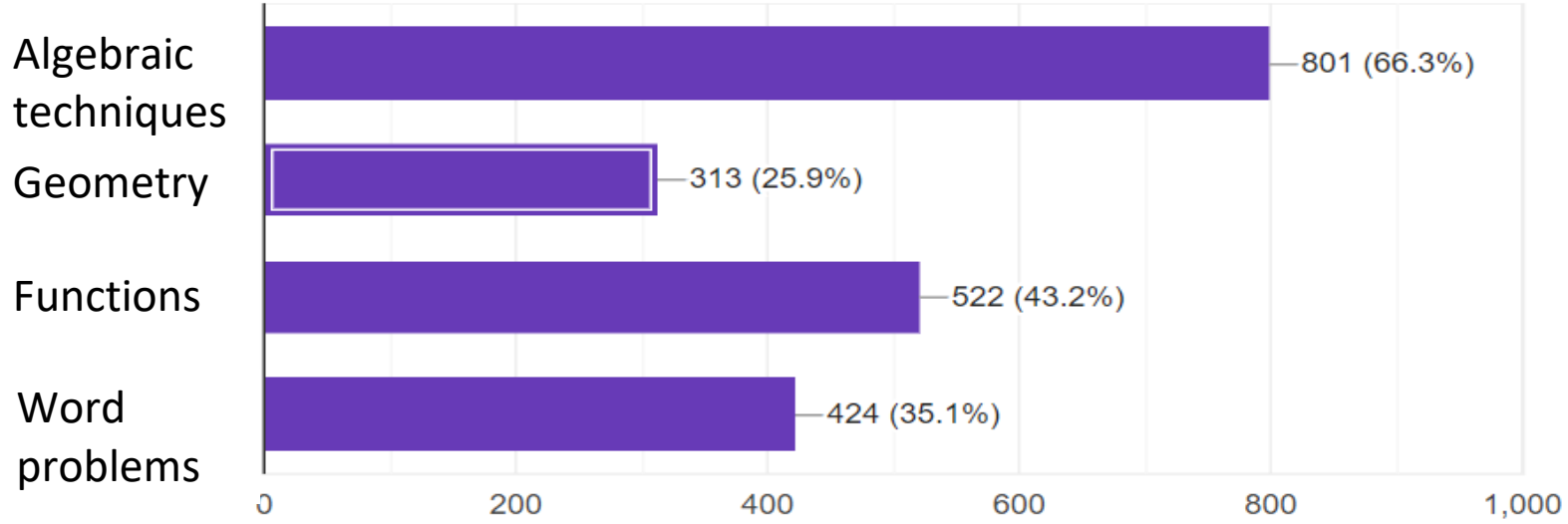
Conclusions from the year 2020 and planning for next year

- We are expanding this program to all of the math learning for junior high and high school
- It’s right for the corona times
- It’s right for the 21st Century:
  - Autonomous learning
  - Data based teaching
  - Learning to learn
  - Personal learning

Poll

What is the topic that you think would be the easiest to teach remotely?

* Algebraic techniques
* Geometry
* Functions



Annual Layout Example - 8th Grade

Subjects that may be dropped

- In-class
- Distance
- Hybrid

Numerical Domain	Geometric Domain	Algebraic Domain	Total Hours	
Ratio (3)	Parallel Line (2), Congruent Triangles (5)	Linear Function (5)	**15**	September
Ratio (3)	Median (2), Isosceles Triangle (3)	Linear Function (5)	**13**	October
Ratio (3)	Isosceles Triangle (2), Triangle Similarity (7)	Linear Function (8)	**20**	November
Proportion (5), Square Root (2)	Triangle Similarity (5)	Linear Function (2)	**15**	December
Scaling (6), Irrational Numbers (2)		Equations (5) Word Problems (7)	**20**	January
Percentage (10)		Algebraic Technique (5)	**15**	February
Statistics (6)	Pythagorean Theorem in Plane (7)	Algebraic Technique (2)	**15**	Marce
Statistics (4)	Pythagorean Theorem in Space (5)	System of Linear Equations (6)	**15**	April
Probability (6)	Exercise (5)	System of Linear Equations (2) Word Problems (7)	**20**	May
Probability (4)	Exercise (8)	Absolute Value (3)	**15**	June
			163	**Total**

In case of distance learning in September - October

Numerical Domain	Geometric Domain	Algebraic Domain	Total Hours	
Ratio (3)	Linear Function (8)	Linear Function (5)	**15**	September
Ratio (3)	Linear Function (2)	Linear Function (5)	**13**	October
Ratio (3)	Median (2), Isosceles Triangle (3)	Parallel Line (2), Congruent Triangles (5)	**20**	November
Proportion (5), Square Root (2)	Isosceles Triangle (2), Triangle Similarity (7)	Isosceles Triangle (2), Triangle Similarity (7)	**15**	December
Scaling (6), Irrational Numbers (2)		Equations (5) Word Problems (7)	**20**	January
Percentage (10)		Algebraic Technique (5)	**15**	February

What's New for 9/2020

- The professional training will be dedicated to hybrid learning
- All the studies will be hybrid
- Curriculum priorities will be defined and suited for a possible lockdown

“It was the best of times,

it was the worst of times”

Charles Dickens

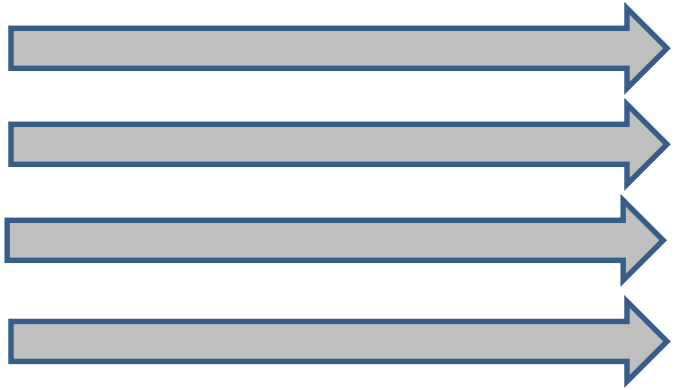
What could and perhaps should be breached in our mathematics teaching?

What is our goal in mathematics teaching?

More explorative participants in the mathematics discourse

Explorative participants in the mathematics classrooms

- Flexibility
- Substantiatiability
- Objectification
- Agentivity



Communication!

21st century skills

- Collaboration and teamwork
- Creativity and innovation
- Critical thinking
- Problem solving
- Communication
- Self-direction

How?

Thank you!

- **Dr. Talia Leven**, mathematics educator, Levinsky College of Education
- **Assaf Dvir**, Gymnasia Herzlia school, Levinsly College of Education
- **Moshe Dishi**, Tichonet High school
- **Magdoleen Hazran**, mathematics teacher in the Druze village of Yarka
- **Fatena Marjie**, National instructor of middle school mathematics;
- **Anna Vaknin**, head of mathematics teaching at the Amal School Network
- **Shai Nisan**, head of cultural and pedagogical change and of assessment and measurement in AMIT network

Thank You