

Teaching and Learning Mathematics

What has changed after the pandemics?

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*Transformation on
educational practices*



**“It always seem impossible
until it’s done”**

Nelson Mandela

INTRODUCTION

integrating technology in mathematics education had a range of purposes

before pandemics such as

- Student Engagement
- Modelling maths concepts
- Creating fun during practice
- Selective trial of online tools

during pandemics such as

- Online delivery of the curriculum
- Increasing level of interaction
- Online assessment
- Compulsory trial of most online tools

$$\frac{a \times b}{x}$$

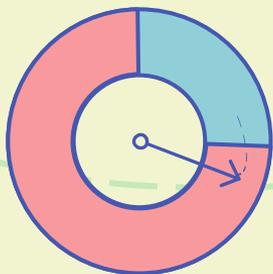
Where you teaching at?

Which school section
are you teaching in?

Go to www.menti.com and use the code 4146 3621



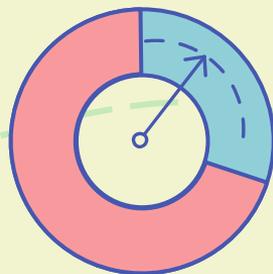
SCHOOL CLOSURE PERCENTAGES (HIGH)



75%

Turkey

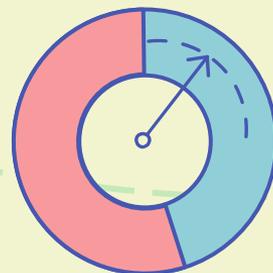
Turkey had the highest percentage in school closures.



69%

Romania

Romania had a similar high percentage in school closures.



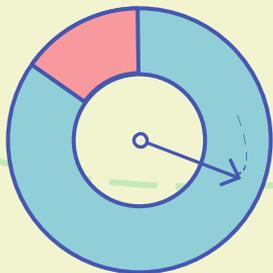
54%

Poland

Poland was third in school closures.

SCHOOL CLOSURE PERCENTAGES

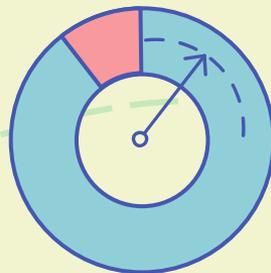
(LOW)



16%

Switzerland, Liechtenstein

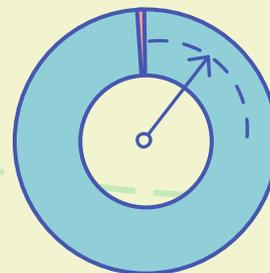
had low percentages
in school closures.



12%

Norway

Norway had a similar
low percentage in
school closures.



0%

Iceland, Sweden

These countries almost
had no school closures



“When online learning is well-designed, it can be as good or even better than in-person classroom learning for students who have the requisite instructional supports.

Frequent, direct, and meaningful interaction that combines synchronous and asynchronous instruction is essential to whether students succeed or struggle with online education.

*“Research has shown that through technologies like social media, teachers can enhance interactions between students, between students and teachers, and with people and resources outside the classroom. All are important for a student's sense of belonging in an educational community.” (Posted March 11, 2021)**

- Dr. Christine Greenhow
Associate Professor of Educational Psychology and Educational Technology, Michigan State University;

*“Research shows that, **wherever it happens, learning is built on a safe and warm relationship between a student and their teacher.** While that’s harder to accomplish when students are remote, teachers have made incredible strides this year finding innovative ways to connect with students and empower their success.*

*“From teachers instructing online, we’ve heard that learning has been structured in a different way. Most students are not spending all day on a video call with their teacher: **they’re doing much more independent work than they would in an ordinary classroom.** Many students can grow and thrive with the right content and practice opportunities, but others have struggled to stay engaged.”*

(Posted March 11, 2021)

- Brooke Mabry, M.S.A.; N.B.C.T Strategic Content Designer at NWEA

*“One of the positive unintended consequences of having students in mixed learning settings over the past year is that students and teachers now understand that **school doesn’t have to look the same as it has for the past hundred years.**”*

Steve Underwood, Ed.D.
Professional Learning Design Manager at NWEA

*Pro's of online math
classes*

from student and
teacher perspective

*Con's of online math
classes*

from student and
teacher perspective

$$\sqrt{x-y}$$

$$(x-y)^2$$

PRO'S (High School)

Class materials digitally available
Better teacher computer literacy

Customized teaching
Class size-unlimited

More student responsibility for learning

Individual learning pace for students
Online study halls

CON'S (High School)

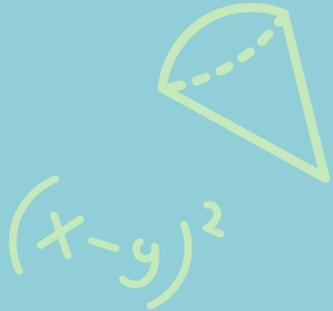
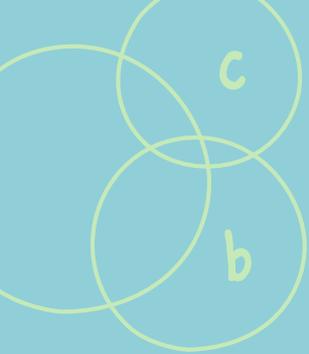
Notational
mistakes

Social and
emotional gaps

Assessment
reliability

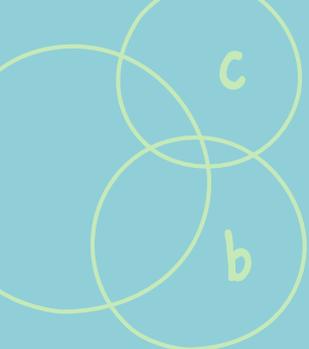
Routines
broken

Parent control
/uncontrol



TEACHER FEEDBACK

“Middle School”



Immature
Social skills

Time
Management
(Screen time)



Assessment
reliability



Rules forgotten

Notational
mistakes

$$(x-y)^2$$



$$x/y$$

STUDENT FEEDBACK

“Middle School”

Social
Adaptation

Communication
with Peers

Time
Management

$$(x-y)^2$$



$$x/y$$



HOW DID/DO WE MOVE ON?

MOOC Systems

Coursera, Udemy

?

Online exams

SAT

?

Flipped Classroom

College Board, Youtube, IB resources, PhET interactive simulations

?



CONCLUDING REMARKS

Technological innovations to fit the needs of education

- * breakout rooms
- * jamboard

Improved use of technology for students and teachers

high computer literacy for both parties

Increased use of flipped learning

Getting used to online courses from early years of education



RESOURCES

<https://link.springer.com/article/10.1007/s10649-021-10043-2>
<http://data.unicef.org>

[Toward Technology Integration in Mathematics Education: A Technology- CITE Journal](#)

<https://www.nctm.org/Standards-and-Positions/Position-Statements/Strategic-Use-of-Technology-in-Teaching-and-Learning-Mathematics/>

<https://www.sciline.org/covid-19/quotes-online-learning/>

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Thank you!

Do you have any questions?
Comments?



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