

EUR-ACE Going Global

Assessing and certifying quality of engineering education programmes worldwide

Virtual Forum

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Consistency in a world gone mad: Assuring the quality and relevance of engineering education in a Dynamic World

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President ENAEE



Overview

- Context: the engineering education environment
- Providing assurance of quality through agreed criteria
- The impact of the pandemic – short and long term

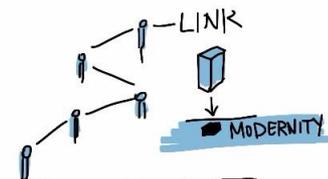
WHAT IS SUBSTANTIAL?

QUALITY NOT QUANTITY

CUMULATIVE EFFECT

FAIRNESS IS IN THE EYE OF THE BEHOLDER

CASE BY CASE analysis



"IT'S THE INTERNET, STUPID"

THERE ARE NO BRIGHT LINES (or are there?)

approach GUIDELINES with CAUTION

[2.5%] QUANTITATIVE RESULT

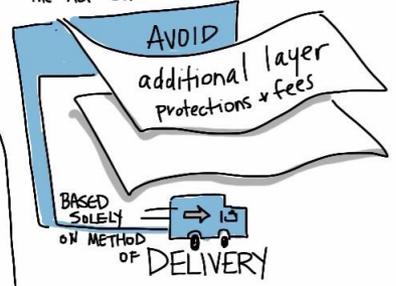
BLURRED at BEST

"ANY MATERIAL WHATEVER"

TECHNOLOGICAL NEUTRALITY

THREAT OR MENACE? #justkidding

AS TECHNOLOGY ADVANCES THE ACT STILL APPLIES CONSISTENTLY



WE LIVE IN INTERESTING TIMES

SOMETIMES WORDS HAVE TWO MEANINGS

"STRIKE THE APPROPRIATE BALANCE"

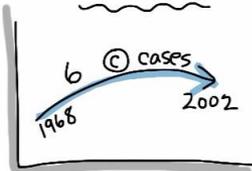
FOR COPYRIGHT LAWYERS

LIFE IS MORE CHALLENGING TOO...

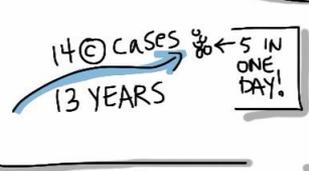
CASEY CHISICK



BEFORE



NOW



Engineering Education Landscape



Engineering Education - Going Global



We still demand a standard engineer as output!

Adding more complexity..



Sustainability



Emerging Technologies – AI, Industry 4.0

Ethical dimension 



Cyber Security



Stay Current (CPD)



Inclusion



Outcomes Based Education

- Standardised learning outcomes
- Thresholds
- Evidence Based
- Broad based descriptors
 - Engineering knowledge
 - Problem solving
 - Teamwork
 - Ethics

2.3 PROGRAMME OUTCOMES FRAMEWORK

- Programme Outcomes describe the knowledge, understanding, skills and abilities which an accredited engineering degree programme must enable a graduate to demonstrate. The Programme Outcomes specified below apply to accredited programmes which are to be awarded a EUR-ACE label by an authorised agency. In this document, the term learning outcome is used only to describe the knowledge, understanding, skills and abilities which apply to individual course units/modules.
- The Programme Outcomes specified in this document are intended to be applicable to the full range of Bachelor and Master Degree programmes in engineering offered in European HEIs. They have to be considered as the 'minimum threshold' defined by the ENAEE community and to be fulfilled in order to assure the quality of engineering programmes.
- The Programme Outcomes can be used in both the design (by engineering academics) and the evaluation (by accreditation agencies) of programmes in all branches of engineering and for different profiles.
- The standards describe the Programme Outcomes that accredited programmes must meet, but do not prescribe how they are realised. Consequently, no restriction is implied or intended by the EAFSG in the design of programmes to meet the specified Programme Outcomes. HEIs retain the freedom to formulate programmes with an individual emphasis and character, including new and innovative programmes, and to prescribe conditions for entry into each programme.
- The Programme Outcomes are described here separately for both Bachelor and Master Degree programmes with reference to the following eight learning areas:
 - Knowledge and understanding;
 - Engineering Analysis;
 - Engineering Design;
 - Investigations;
 - Engineering Practice;
 - Making Judgements;
 - Communication and Team-working;
 - Lifelong Learning.
- The **ENAEE/IEA Glossary of Terminology is used to verify terms used in this document.**

2.3.1 Programme Outcomes for Bachelor Degree Programmes

KNOWLEDGE AND UNDERSTANDING

The learning process should enable **Bachelor Degree graduates to demonstrate:**

- knowledge and understanding of the mathematics and other basic sciences underlying their engineering specialisation, at a level necessary to achieve the other programme outcomes;
- knowledge and understanding of engineering disciplines underlying their specialisation, at a level necessary to achieve the other programme outcomes, including some awareness at their forefront;
- awareness of the wider multidisciplinary context of engineering.

ENGINEERING ANALYSIS

The learning process should enable **Bachelor Degree graduates to demonstrate:**

- ability to analyse complex engineering products, processes and systems in their field of study; to select and apply relevant methods from established analytical

International Recognition



Transnational Accreditation by ENAEE Authorized Agencies: A Good Practice Guide

Document status:

- Recommended by the ENAEE Administrative Council (June 2016), for a test period of 2 years (2017-2018)
- Approved for a test period of 2 years (2017-2018) by the ENAEE General Assembly (November 2016)

Scope:

This document covers good practice guidelines which ENAEE Authorized Agencies (agencies authorized by ENAEE to award the EUR-ACE® label) should follow when performing:

- Transnational Accreditation, as below defined (i.e. including the award of the EUR-ACE label)
- Accreditation of International¹ Double or Joint Degrees

Definitions:

"Transnational Accreditation": Accreditation (including the award of the EUR-ACE label) by an ENAEE Authorized Agency, of an (engineering) degree programme run by a Higher Education Institution (HEI) based in a country different from the Agency's country.

"Double (Dual) Degrees": Degrees awarded following successful completion of the requirements for two degree programmes from two HEIs, as defined in an agreement between the two HEIs, each HEI being primarily responsible for its own degree programme.

"Joint Degrees": Awarded by two or more partner HEI's, following successful completion of a programme comprising a single joint curriculum leading to a single degree. Governance groups, governance boards share authority and responsibility.

TRANSNATIONAL ACCREDITATION

As a guiding principle, each HEI is entitled to choose which ENAEE Authorized Agency they wish to accredit their engineering degree programmes leading to the award of the EUR-ACE Label. This includes the freedom of the HEI to choose an agency other than its national agency, should it wish to do so (this is already formally the case in several EHEA countries). This also includes the possibility to undergo an accreditation by an external agency in addition to a mandatory national one.

A) ENAEE Authorized Agencies accrediting outside their own country:

Any EUR-ACE-authorized Agency can award the EUR-ACE label in any country in accordance with the rules below.

However, in authorizing for the first time, an Agency to award the EUR-ACE label, ENAEE can restrict the operations of the newly authorized Agency - for the purpose of granting the EUR-ACE label – to that Agency's national territory for a period determined by ENAEE.

¹ In this document, only double or joint degrees involving institutions from two (or more) different countries are considered.

Status: 16/12/2016/04 approved



Many databases of programmes...

Welcome to the ENAEE Database of EUR-ACE Accredited Programmes

Database of EUR-ACE® labelled programmes

In this database you find the engineering degree programmes at First Cycle (Bachelor), Second Cycle (Master) and Second Cycle Integrated (Master) which have been awarded the EUR-ACE® label by ENAEE Authorized Agencies. EUR-ACE Label certificates are valid only if the degree programmes which are listed on them are also in this database.

MORE INFO

Use the information that you need using the criteria above. You can also use the "keyword" box if you know part of the name that you seek (e.g. "Manufacturing"). Then apply "Filter". Clicking on a programme name will provide further details on the programme and the awarding HEI.

OVERVIEW BY DEGREE TYPE BY COUNTRY

Using this filter provides a list of EUR-ACE labelled programmes that correspond to the criteria you set above.

Accreditation agency	HEI name	Programme name	Degree title	Degree type	Accreditation period	Country	City (local)
	HEIA-FR	Bachelor of Science HES-SO in Chemistry	Bachelor of Science	FCD	06/04/2020 until 05/04/2027	Switzerland	Fribourg
	Ural Federal University named after the first President of Russia B.N. Yeltsin	Materials of Micro- and Nanosystem Techniques	Master	SCD	21/12/2017 until 21/12/2022	Russian Federation	Екатеринбург
	Ural Federal University named after the first President of Russia B.N. Yeltsin	Production of Construction Materials and Products	Master	SCD	21/12/2017 until 21/12/2022	Russian Federation	Екатеринбург

eqar

Register Database Knowledge base News

eqar.eu > Database > Search > By institution

Database

Search

By institution

By report

Visualise data

Download data

Connect to API

Find out more

Database of External Quality Assurance Results



Welcome to the FEANI FEED European Engineering Education Database (previously known as FEANI INDEX). Start searching for Higher Education Institutions and their programmes.

Search

HEI name	Country	City
Brandenburg University of Technology Cottbus-Senftenberg	Germany	Cottbus
Breda University of Applied Sciences	Netherlands	Breda
Bridgend College	United Kingdom	
Brno University of Technology	Czech Republic	Brno
Brooklands College	United Kingdom	
Brunel University with Trowbridge College	United Kingdom	Uxbridge
Brunel University	United Kingdom	Uxbridge
Brunswick University of Technology	Germany	Braunschweig
Bucks New University	United Kingdom	
Budapest Polytechnic, Kando Kálmán College Faculty of Electrical Engineering	Hungary	Budapest
Budapest Polytechnic, Rejtő Sándor College Faculty for Light Industry Engineering	Hungary	Budapest
Budapest Polytechnicum, Bánki, Donát Technical College Faculty for Mechanical Engineering	Hungary	Budapest
Bursa Uludağ University, Faculty of Engineering	Turkey	Bursa
Burton on Trent College	United Kingdom	Brighton
Buskensud College, Engineering Programme	Norway	Kongsberg

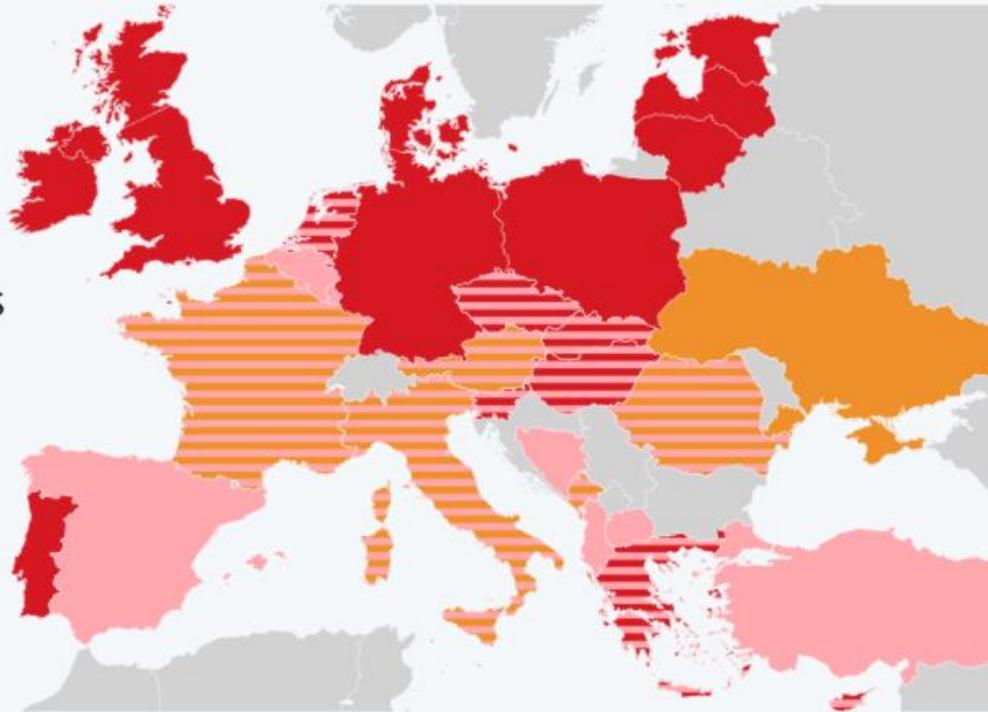
Europe Stays in Lockdown Mode

European countries by second-wave COVID-19 lockdown measures imposed*

■ National lockdowns

■ Local lockdowns

■ National curfews



* As of March 22, 2021

Restaurants closed: Austria, France, Luxembourg, Belgium, Croatia, Switzerland, parts of Finland. Business curfews in Spain, Italy, Portugal, Belgium, Kosovo, Serbia, Moldova, Ukraine and Bulgaria

Source: Media reports



Is this the new school system?

- This is a photo of a teacher during a distance lesson for the course of Primary Education Sciences at University of Pisa (Italy) (2019-2020) in the period of pandemic Covid-19. The lesson was about chemical reaction for the primary school: here, I was showing few experiments to my students from my home kitchen.



Covid 19-impacts

- Rapid move to online
- Modified assessment methods
- Grade inflation?
- Reduced lab work
- Different teamwork experience
- Reduced student placement
- Some students disadvantaged?

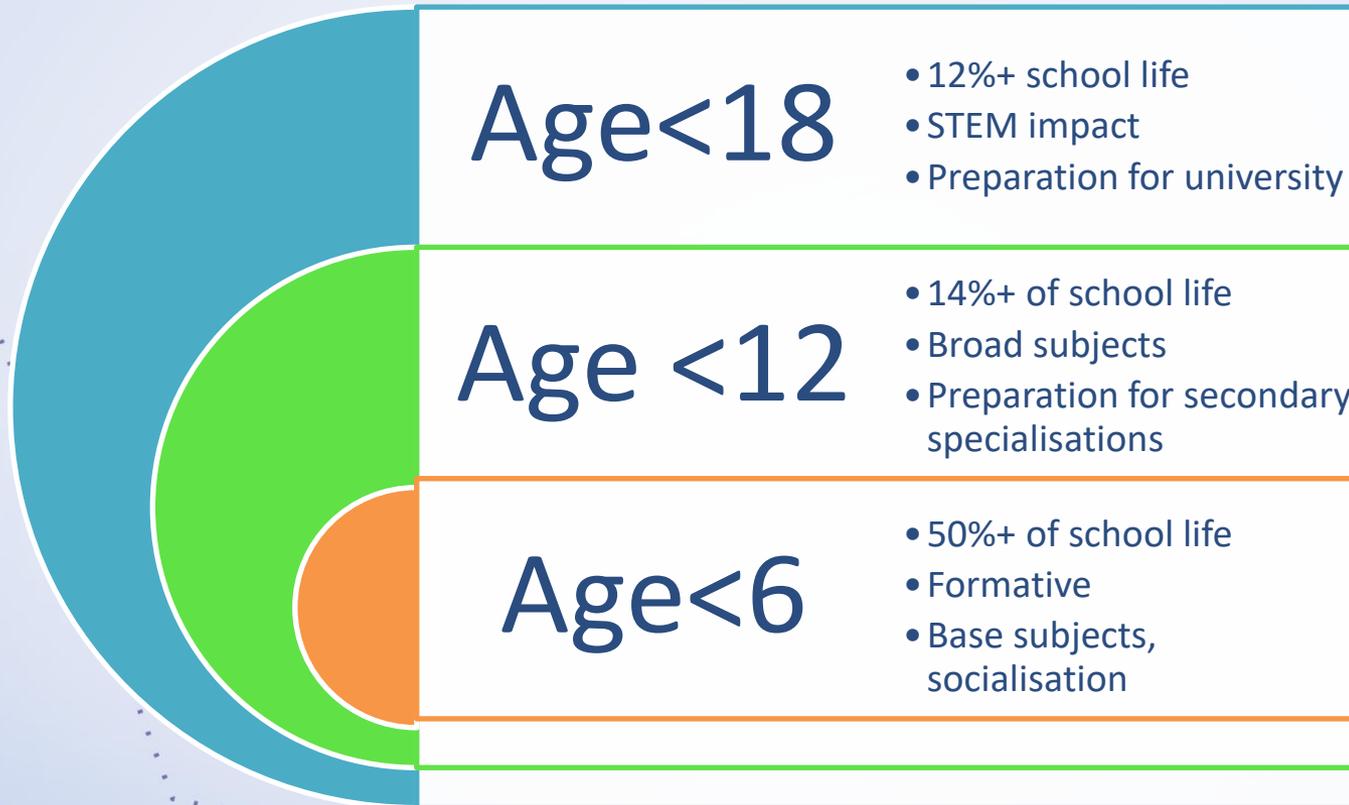
COVID-19: Schools for more than 168 million children globally have been completely closed for almost a full year, says UNICEF

UNICEF unveils 'Pandemic Classroom' at United Nations Headquarters in New York to call attention to the need for governments to prioritise the reopening of schools

02 March 2021



Loss of 1 year education



Schoolchildren worldwide have lost 1.8 trillion hours of in-person training
– UNICEF 17.09.21

OECD

“While the precise learning losses are not yet known, existing research suggests that the students in grades 1-12 affected by the closures might expect some 3 percent lower income over their entire lifetimes. For nations, the lower long-term growth related to such losses might yield an average of 1.5 percent lower annual GDP for the remainder of the century. These economic losses would grow if schools are unable to re-start quickly.”

Just returning schools to where they were in 2019 will not avoid such losses. Only making them better can. While a variety of approaches might be attempted, existing research indicates that close attention to the modified re-opening of schools offers strategies that could ameliorate the losses.”

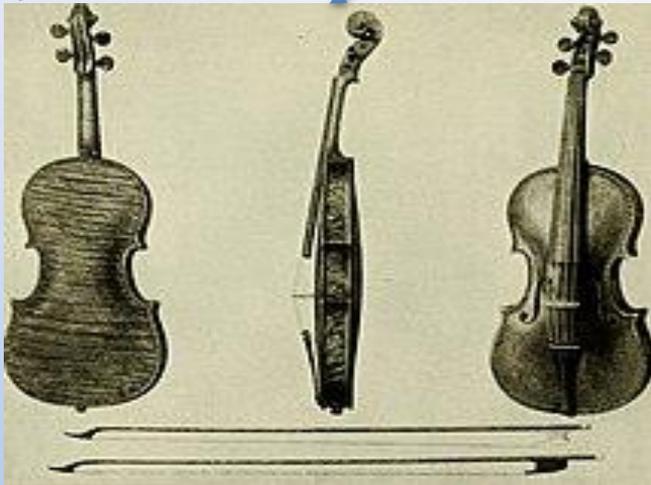
OECD report 2020 - The Economic Impacts of Learning Losses



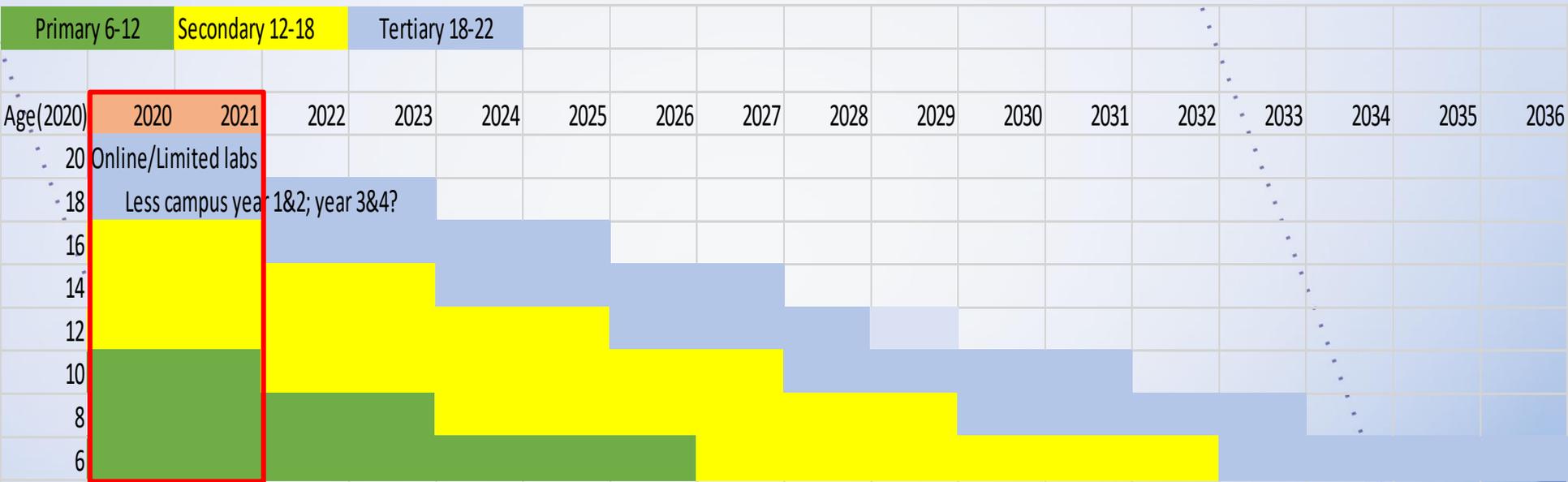
Antonio Stradivari



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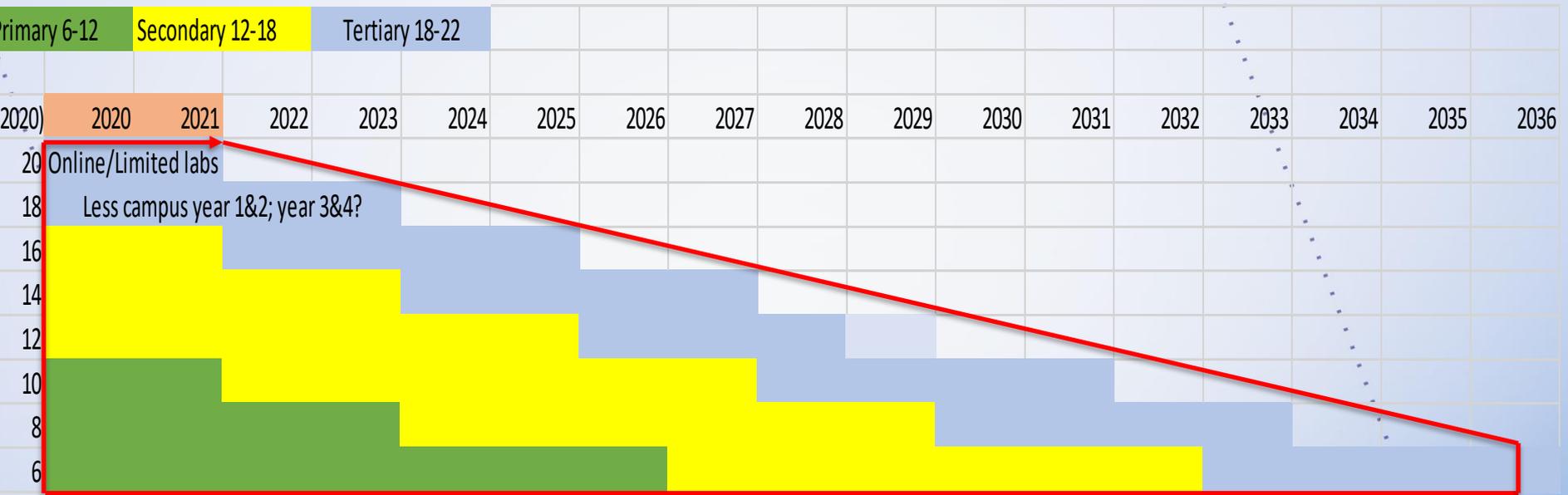
Re-framing the 'growth rings'



Movement of impact of loss due to pandemic



The real impact will last?



The future education 'rings'?



Thank You!

Useful links

- <https://www.oecd.org/education/The-economic-impacts-of-coronavirus-covid-19-learning-losses.pdf>
- <https://onlinelibrary.wiley.com/doi/full/10.1111/emip.12368>
- <https://voxeu.org/article/impact-covid-19-education>
- <https://www.nciea.org/blog/covid-19-disruptions/assessing-academic-impact-covid-19-summer-2021>
- The failure of input-based schooling policies, Eric A. Hanusek, The Economic Journal 113 – F64-F98 - Royal Economic Society 2003.
- EURACE Framework Standard and Guidelines
- Transnational Accreditation for ENAEE Authorised Agencies – a Good Practice Guide
- Photos : https://commons.wikimedia.org/wiki/Main_Page