



香港資優教育學苑  
The Hong Kong Academy for Gifted Education

# Nurturing '21st Century Skills' among the Gifted 讓資優生有效掌握「21世紀技能」

**Dr Rachel ZORMAN**  
Henrietta Szold Institute, Israel

7 December 2018 (Friday)

# 21<sup>st</sup> CENTURY SKILLS

## Why, What & How to Cultivate Them

2018

Dr. Rachel Zorman  
Executive Director



The Henrietta Szold Institute  
Jerusalem, Israel

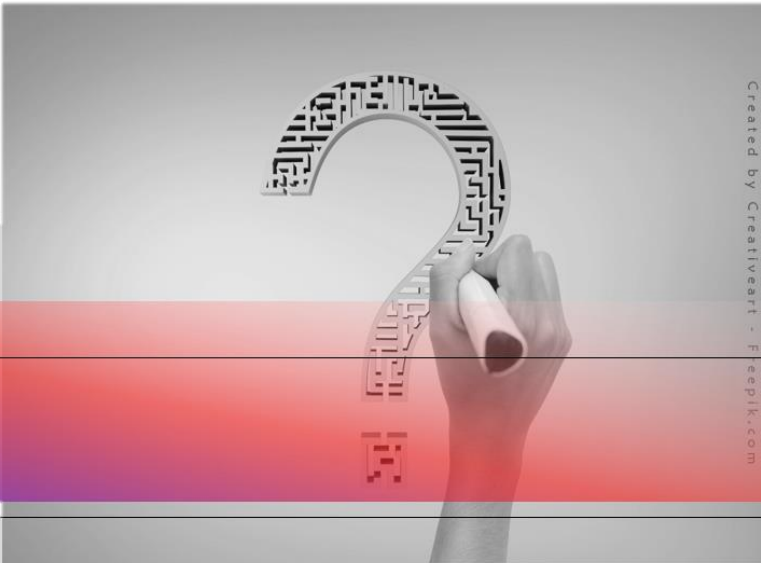
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INTRODUCTION The Henrietta Szold Institute

WHY is there a need to cultivate 21<sup>st</sup> century skills?

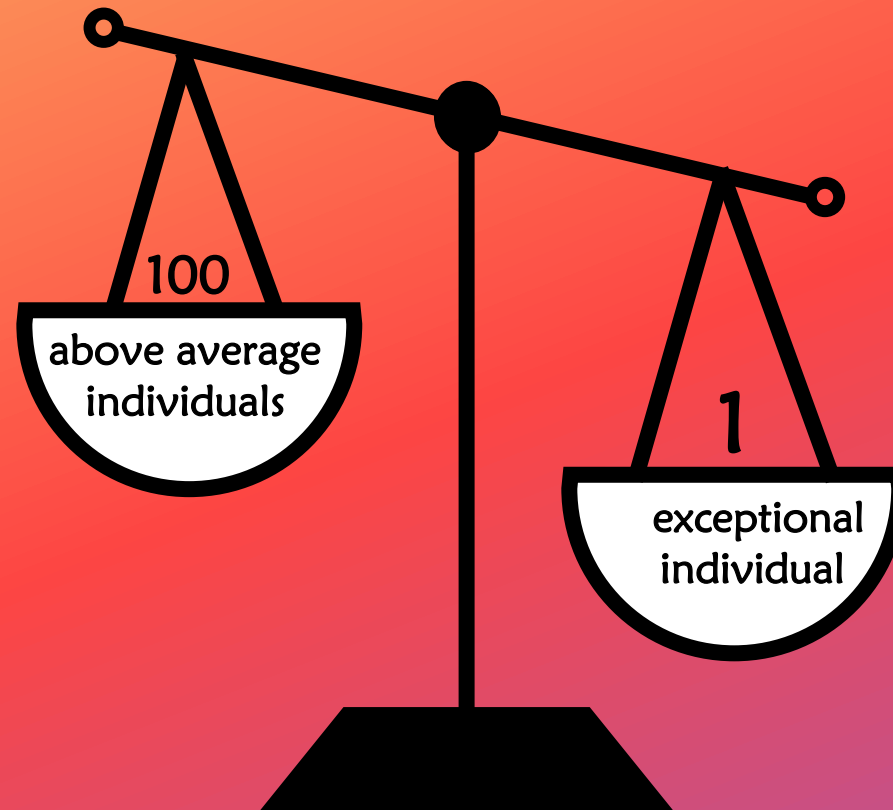
WHAT are 21<sup>st</sup> century skills comprised of?

HOW can 21<sup>st</sup> century skills be cultivated?



# Why Focus on Enhancing 21<sup>st</sup> Century Skills Among Gifted Individuals?

Lessons Learned from Israel – The Startup Nation





The Henrietta Szold Institute  
Jerusalem, Israel



Chairman of the Board:  
Ms. Shlomit Amichai



Executive Director:  
Dr. Rachel Zorman

# Vision

Enhancing the quality of the Israeli educational and social systems

# Mission

Providing applied research and evaluation services to education and social services practitioners and decision makers





# Department of Educational and Psychological Measurement

- ✓ Adapting individual intelligence tests (translation, adaptation and norming: the Kaufman and the Wechsler)
- ✓ Developing and administering tests to identify giftedness among all elementary school students in Israel
- ✓ Developing and administering achievement and matriculation tests
- ✓ Providing training for educators



# Department of Educational and Psychological Measurement



## The Everest Program

identifying and nurturing talent  
in music, science, art and sports  
among elementary school  
students from diverse  
populations



## National Mentoring Program

matching highly gifted  
adolescents with professional  
mentors in their field of  
interest to work on joint  
projects





# Why

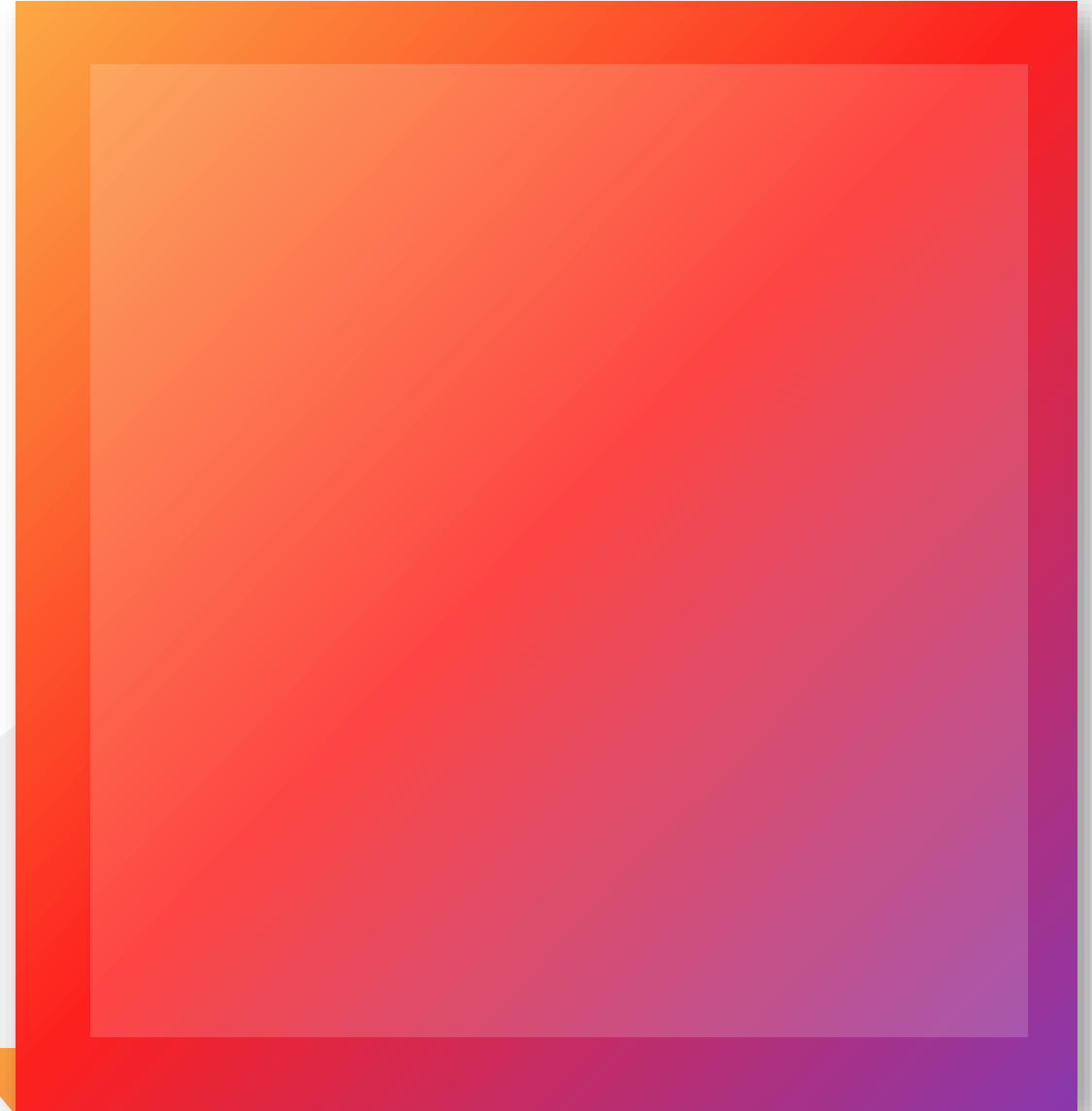
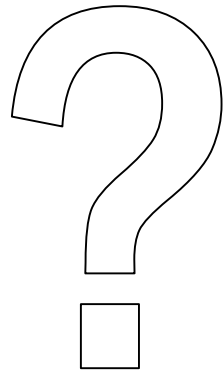


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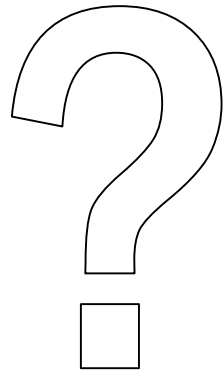
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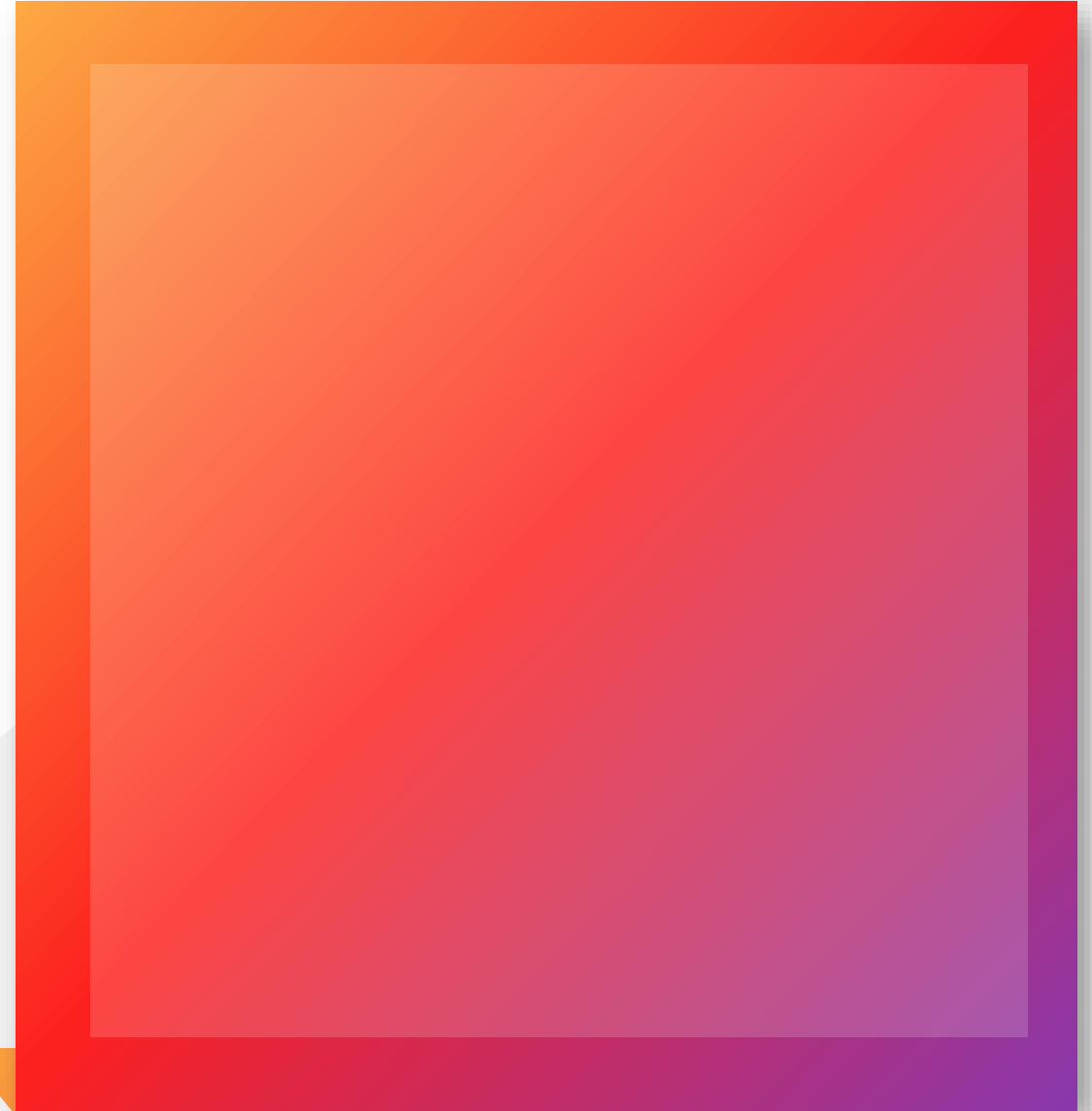
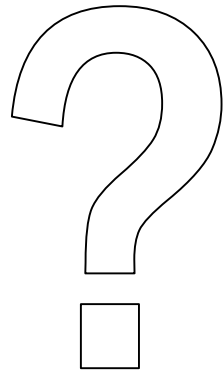


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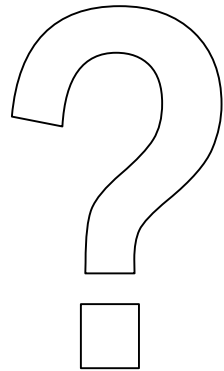
# Why Do We Need 21<sup>st</sup> Century Skills?

How has innovation changed demands in the workplace?



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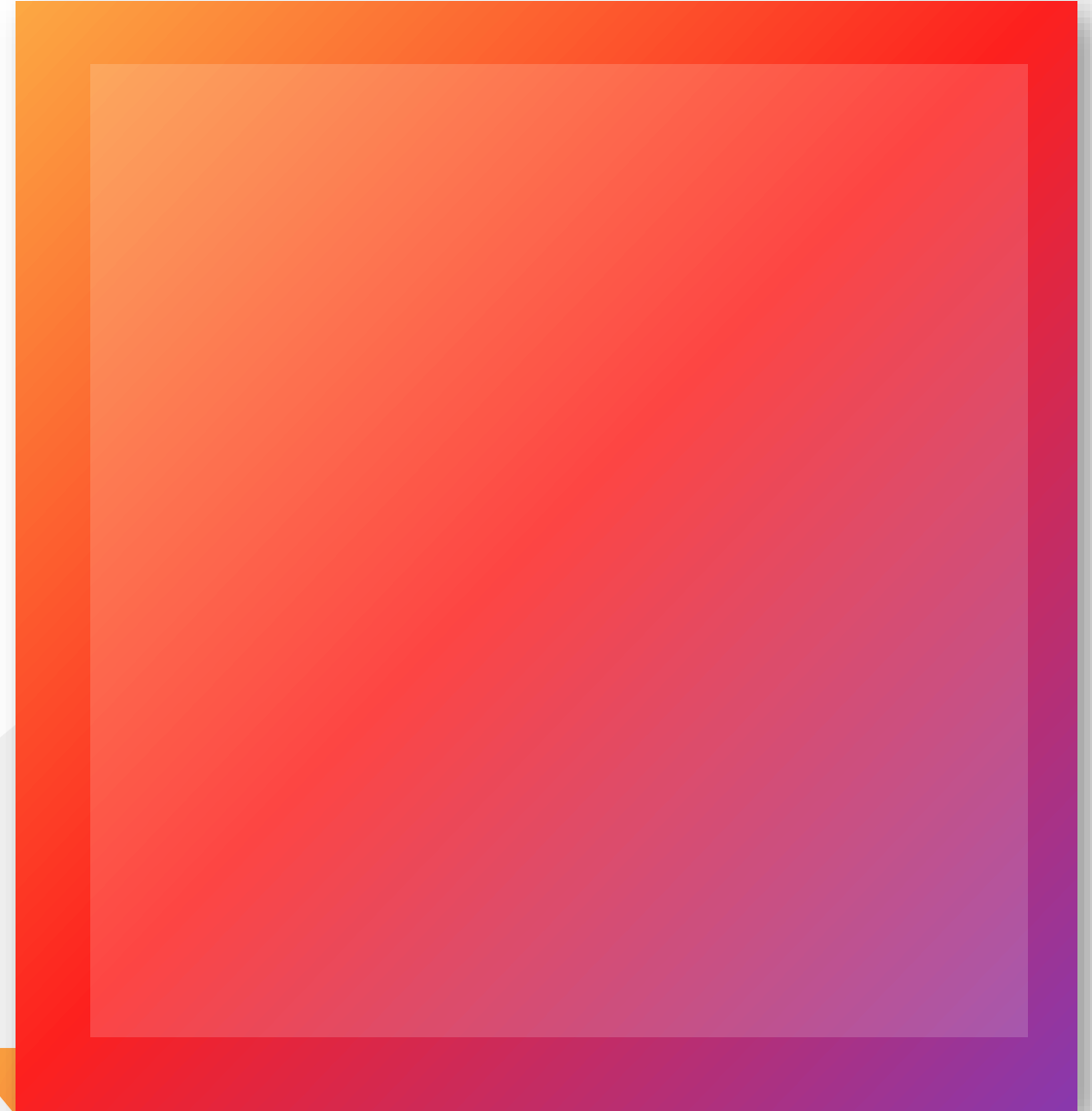
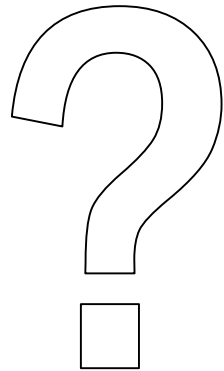


Skill-based change



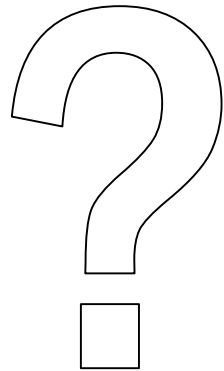
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What kinds of skills are used to develop innovations in a global world?



# Why Do We Need 21<sup>st</sup> Century Skills?

What kinds of skills are used to develop innovations in a global world?



A Mix of diverse  
cognitive and social-  
emotional skills





# Why Do We Need 21<sup>st</sup> Century Skills?

Extremely rapid pace of innovation leads to:



Need for lifelong learning, transferable skills

lack of knowledge about future knowledge demand



# Why Do We Need 21<sup>st</sup> Century Skills?

## Types of work tasks:

(Levy and Murnane, 2010)

→ Routine Cognitive Tasks

→ Routine Manual Tasks

→ Non-routine Manual Tasks

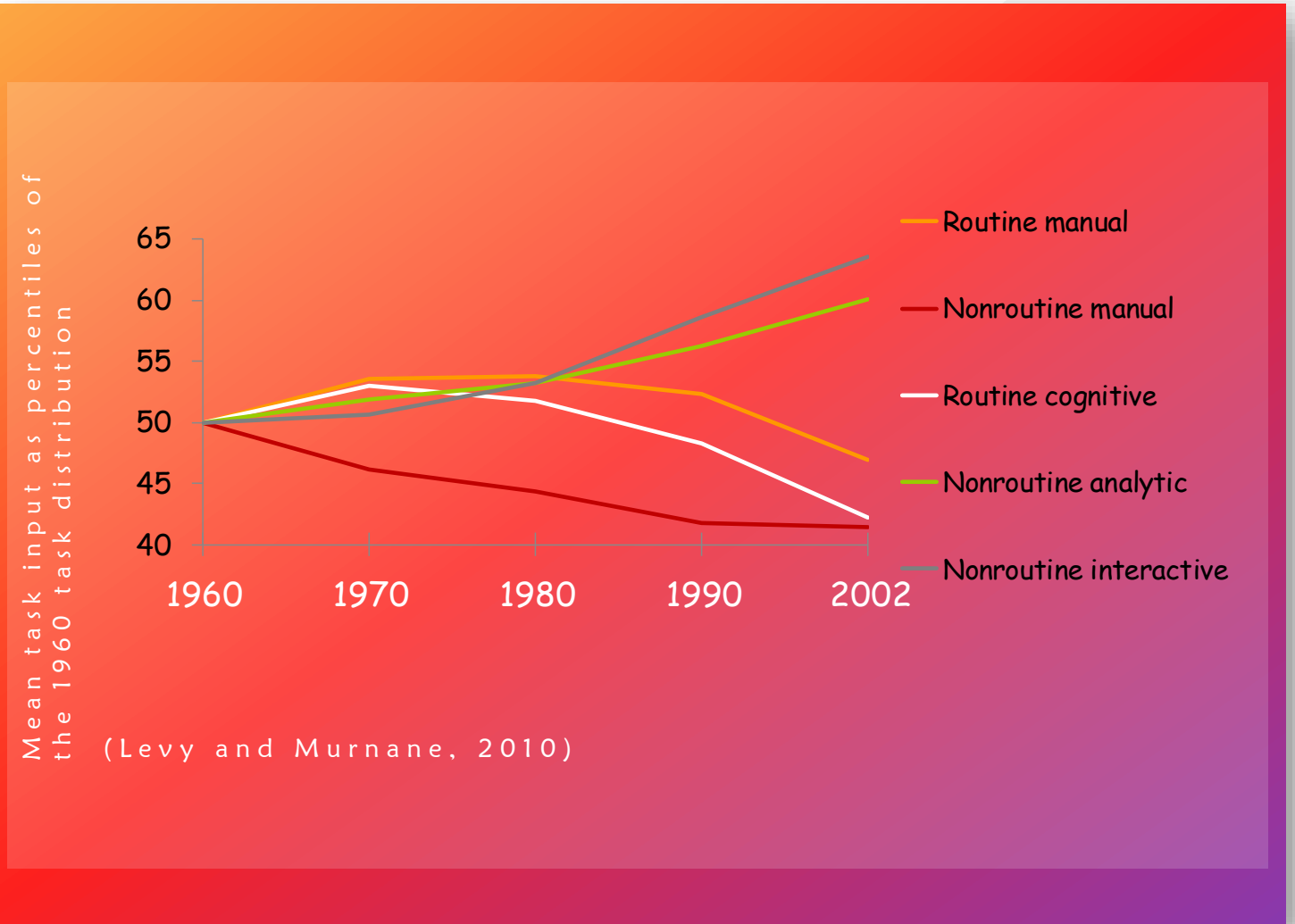
→ Non-routine Analytic Tasks Requiring Expert Thinking

→ Non-routine Tasks Requiring Complex Interactive communication



# How the demand for skills changed?

Economy-wide measures of routine and non-routine task input (US)



# What



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# Essential 21st century skills

the 21st C Learner is...



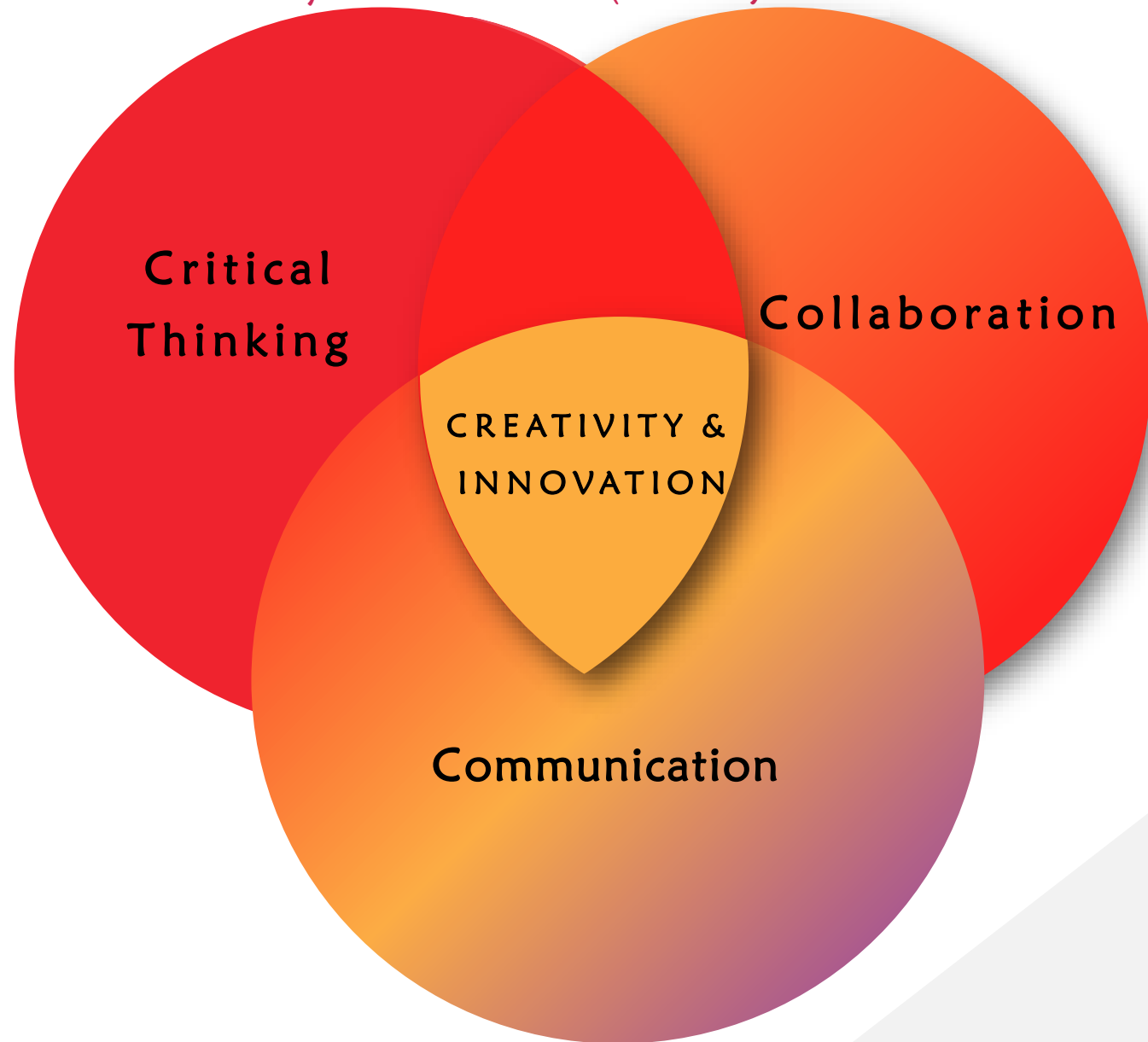
- Conscientious
- Self-directed learner
- Creative
- Financially & economically literate
- Collaborator
- Civically engaged
- Critical thinker
- Communicator
- Globally aware



# Essential 21<sup>st</sup> century skills

Partnership for 21<sup>st</sup> Century Education (2007)

The Four C's



<https://youtu.be/QrEEVZa3f98>

# Introduction to the 4 Cs





# Essential 21<sup>st</sup> century skills – the four c's

## Critical Thinking

Partnership for 21<sup>st</sup> Century Education (2007)

*"The development of general ability for independent thinking and judgement should always be placed foremost."*

*Albert Einstein*

- ✓ Reasoning
- ✓ Systems thinking
- ✓ Making judgements and decisions
- ✓ Problem solving



# Essential 21<sup>st</sup> century skills – the four c's

## Collaboration

Partnership for 21<sup>st</sup> Century Education (2007)

*“Great things in business are never done by one person. They are done by a team of people.”*

*Steve Jobs*

- ✓ Function effectively with diverse teams
- ✓ Make compromises to accomplish a common goal
- ✓ Assume shared responsibility for collaborative work.



# Essential 21<sup>st</sup> century skills – the four c's

Effective communication

Partnership for 21<sup>st</sup> Century Education (2007)

***“The five essential entrepreneurial skills for success are concentration, discrimination, organization, innovation and communication.”***

*Michael Faraday*

- ✓ Express ideas effectively
- ✓ Listen to others
- ✓ Use communication successfully for different goals.
- ✓ Use communication effectively in diverse settings.



# Essential 21<sup>st</sup> century skills – the four c's

## Creativity

Partnership for 21<sup>st</sup> Century Education (2007)

*“You see things; and you say, ‘why?’  
But I dream things that never were; and  
I say, ‘why not’?”*

*George Bernard Shaw*

*"The pessimist sees difficulty in every  
opportunity. The optimist sees the  
opportunity in every difficulty ”*

*Winston Churchill*

- ✓ Engage in a flow of diverse ideas without initial judgement, such as brainstorming
- ✓ Refine, elaborate and analyze original ideas
- ✓ Think outside the box, be open and look for different perspectives
- ✓ View mistakes and failure as an opportunity to learn



# Essential 21<sup>st</sup> century skills – technological skills

Partnership for 21<sup>st</sup> Century Education (2007)

## Digital media literacy

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being familiar with various digital media using digital media effectively

## Digital information literacy

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knowing how to acquire valid information from reliable internet sources



# Essential 21<sup>st</sup> century skills- life and career skills

Partnership for 21<sup>st</sup> Century Education (2007)

## Initiative - Self direction

***“Students must have initiative; they should not be mere imitators. They must learn to think and act for themselves.”***

***Cesar Chavez***

## Conscientiousness

***“Success is not final, failure is not fatal: it is the courage to continue that counts.”***

***Winston Churchill***

- ✓ Productivity
- ✓ Self discipline and regulation
- ✓ Persistence – grit  
(Angela Duckworth)



<https://youtu.be/H14bBuluwB8>





# Essential 21<sup>st</sup> century skills – research evidence

Which skills are correlated with desirable outcomes in education, work and health?

- ✓ Most studies were conducted on cognitive skills
- ✓ Cognitive skills - have modest positive correlations with desirable outcomes in education, the workplace, and health.
- ✓ Conscientiousness – has positive correlations with desirable work and educational outcomes
- ✓ anti-social behavior – is negatively correlated with desirable work and educational outcomes



# How



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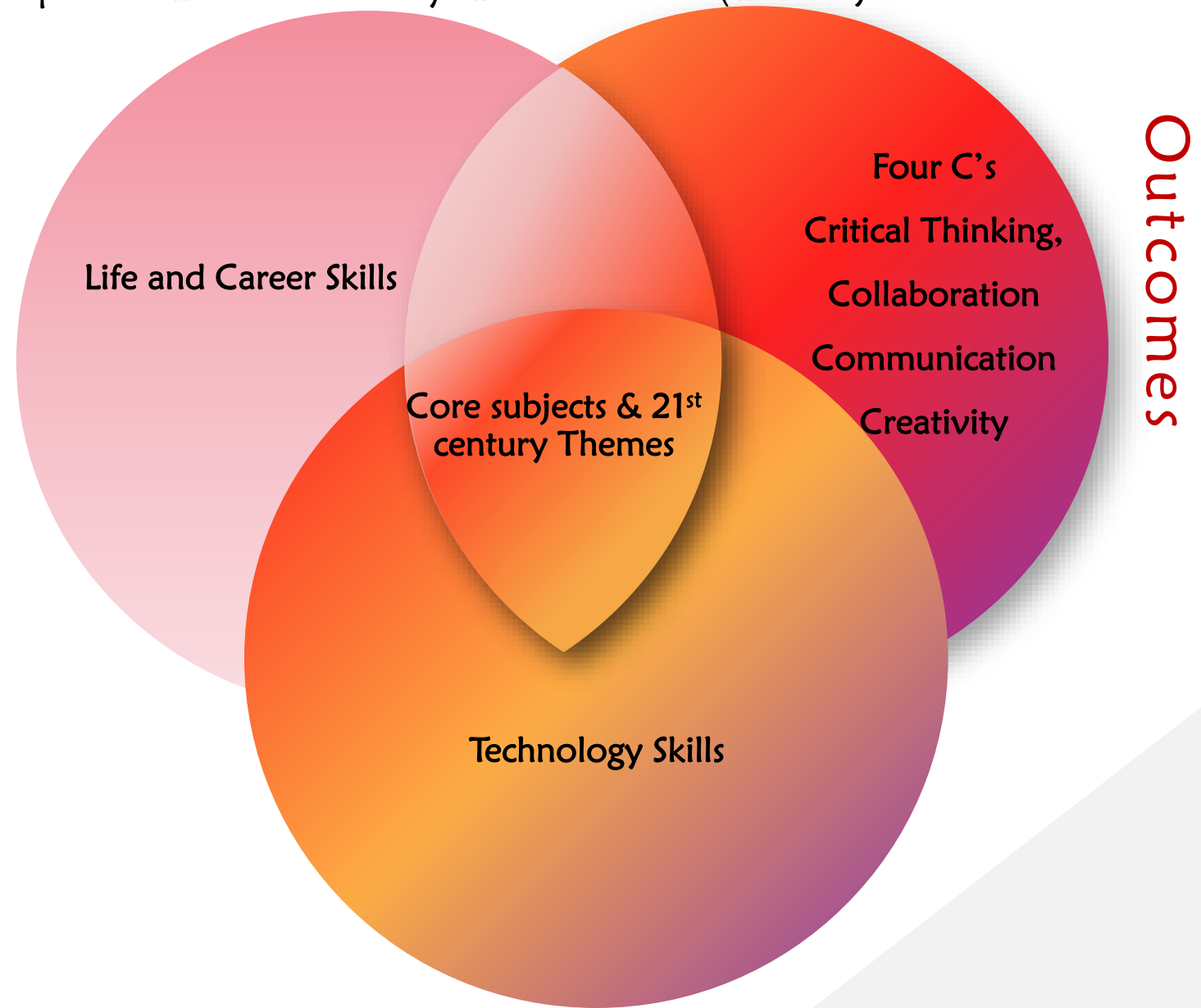


# Framework for cultivating 21<sup>st</sup> century skills

Partnership for 21<sup>st</sup> Century Education (2007)

- Assessments
- Curriculum & Instruction
- Professional Development
- Learning Environment

Support systems



# Successful practices promoting 21<sup>st</sup> century skills

## The Cone of Learning

sparkinsight.com

After 2 weeks,  
we tend to remember ...



Source: Edgar Dale (1969)

*“I see and I forget  
I hear and I remember.  
I do and I understand.”*

*Confucius*



<https://youtu.be/ghx0vd1oEzM>





# Successful practices promoting 21<sup>st</sup> century skills

examples of curriculum units



social studies  
public policy issue

Students analyze the historical evolution of a contemporary public policy issue.

They take a stand on it, communicate their stand to various audiences, and act upon it.

(National Education Association, 2010)



# Successful practices promoting 21<sup>st</sup> century skills

examples of curriculum units



Science – creating a  
science project



Students create a science  
project & present it to  
various audiences audio-  
visually

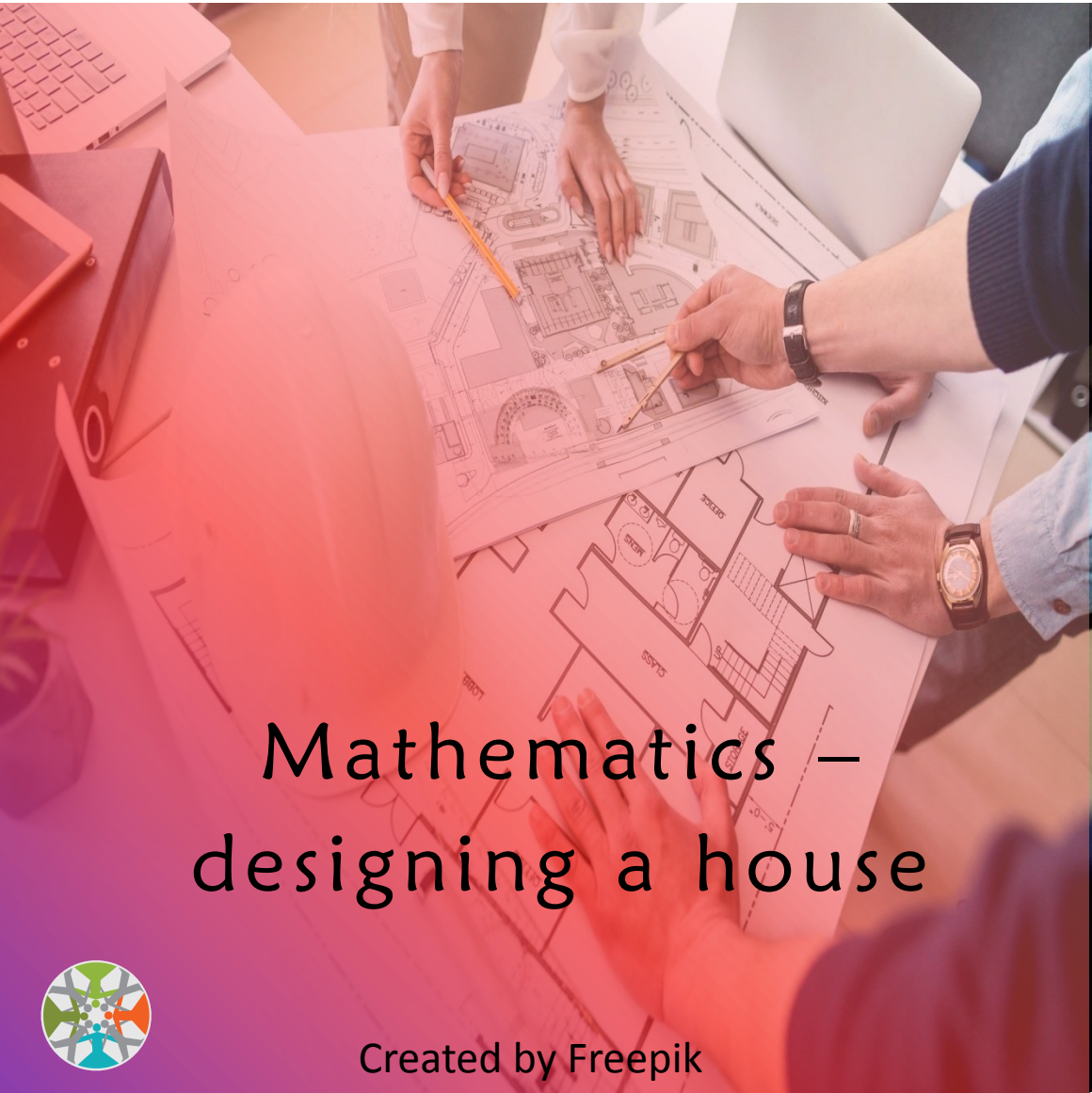
or build a real or virtual  
model, utilizing a computer  
program, to demonstrate a  
science principle

(National Education Association, 2010)



# Successful practices promoting 21<sup>st</sup> century skills

## examples of curriculum units



### Mathematics – designing a house

Created by Freepik



Students work in groups to design a house according to certain measurement specifications.

They are assigned roles according to interests and strengths.

The tasks alternate between group and individual work to reduce social pressures

The design teams produce a scale drawing or an actual or virtual model of the house, utilizing a computer program.

(National Education Association, 2010)

# Successful practices promoting 21st century skills

## examples of curriculum units



Language arts –  
writing a poem

Students choose a social or environmental issue and collect materials on it.

They examine the materials to decide on a certain theme and poetry style.

They proceed to write a poem based on the theme  
(National Education Association, 2010)



# Successful practices promoting 21<sup>st</sup> century skills

## Pedagogical principles



Deep Learning

“A process whereby a person transfers the knowledge and skills learned in a certain context to another new context. In many cases it involves learning in interaction with other people”.

(National Research Council, 2012, P. 3).





# Successful practices promoting 21<sup>st</sup> century skills

## Pedagogical principles



How to Enhance Deep Learning ? Research – Based Instruction



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- Use diverse representations of concepts and tasks, such as diagrams, mathematical representations, and simulations
- Provide opportunities for elaboration, questioning, and explanation
- Provide ample examples and cases

(National Research Council, 2012)

# Cultivating 21<sup>st</sup> century skills

## Pedagogical principles



ABC

How to Enhance Deep Learning ?



- Enhance motivation by linking work to students' lives and interests
- Support students while coping with challenges
- Use formative assessments and provide feedback

(National Research Council, 2012)

<https://youtu.be/Xv2ar6AKvGc>



# Successful practices promoting 21<sup>st</sup> century skills

*“Why is Feedback important?  
We all need people who will  
give us feedback. That's how  
we improve.”*

*Bill Gates*

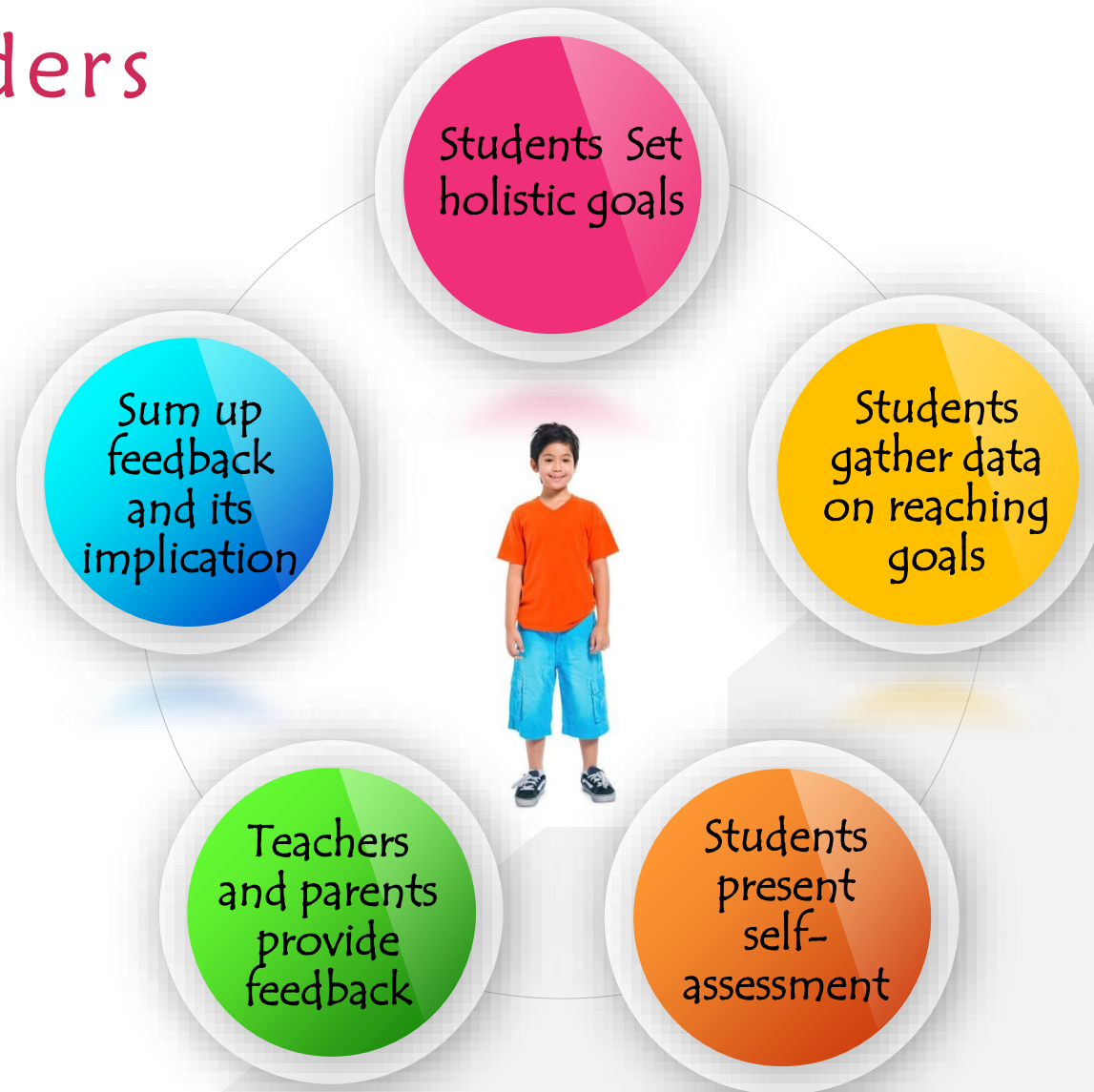
## FEEDBACK

- ✓ Enhances achievement among students
- ✓ Creates a meaningful dialogue
- ✓ Fosters active involvement of students in learning
- ✓ Enhances self evaluation
- ✓ Increases motivation and positive self image
- ✓ Changes strategies of teaching



# Cycle of Growth Oriented Feedback – Involving All Stakeholders

(Zorman, 2016)





# Successful practices promoting 21<sup>st</sup> century skills

## Learning from models of inspiration

*“It is impossible to live without failing at something, unless you live so cautiously that you might as well not have lived at all, in which case you have failed by default.”*

*J.K. Rowling*

Persisting against all odds



The case of J.K. Rowling



# Successful practices promoting 21<sup>st</sup> century skills

## Learning from models of inspiration

*“Sometimes when you innovate, you make mistakes. It is best to admit them quickly, and get on with improving your other innovations.”*

*Steve Jobs*

Learning from mistakes and failures



The case of Steve Jobs



# Successful practices promoting 21<sup>st</sup> century skills

## Regional Responsibility Programs

(Zorman, Nadler & Zeltser, in press)



# Successful practices promoting 21<sup>st</sup> century skills

## National Responsibility Programs

(Zorman, Nadler & Zeltser, in press)

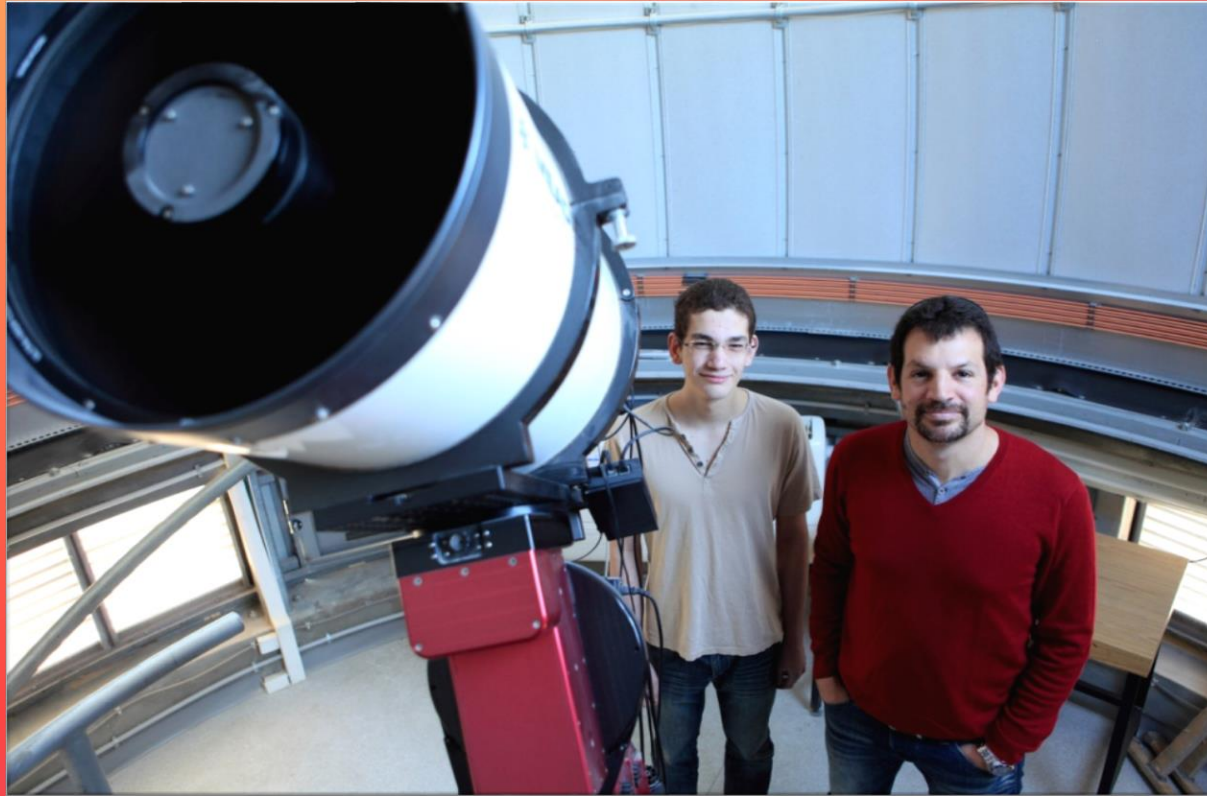




# Successful practices promoting 21<sup>st</sup> century skills

## National Mentoring Program

Zorman, Nadler, Zeltser & Bashan(2018)



# Film on: Mentoring Program

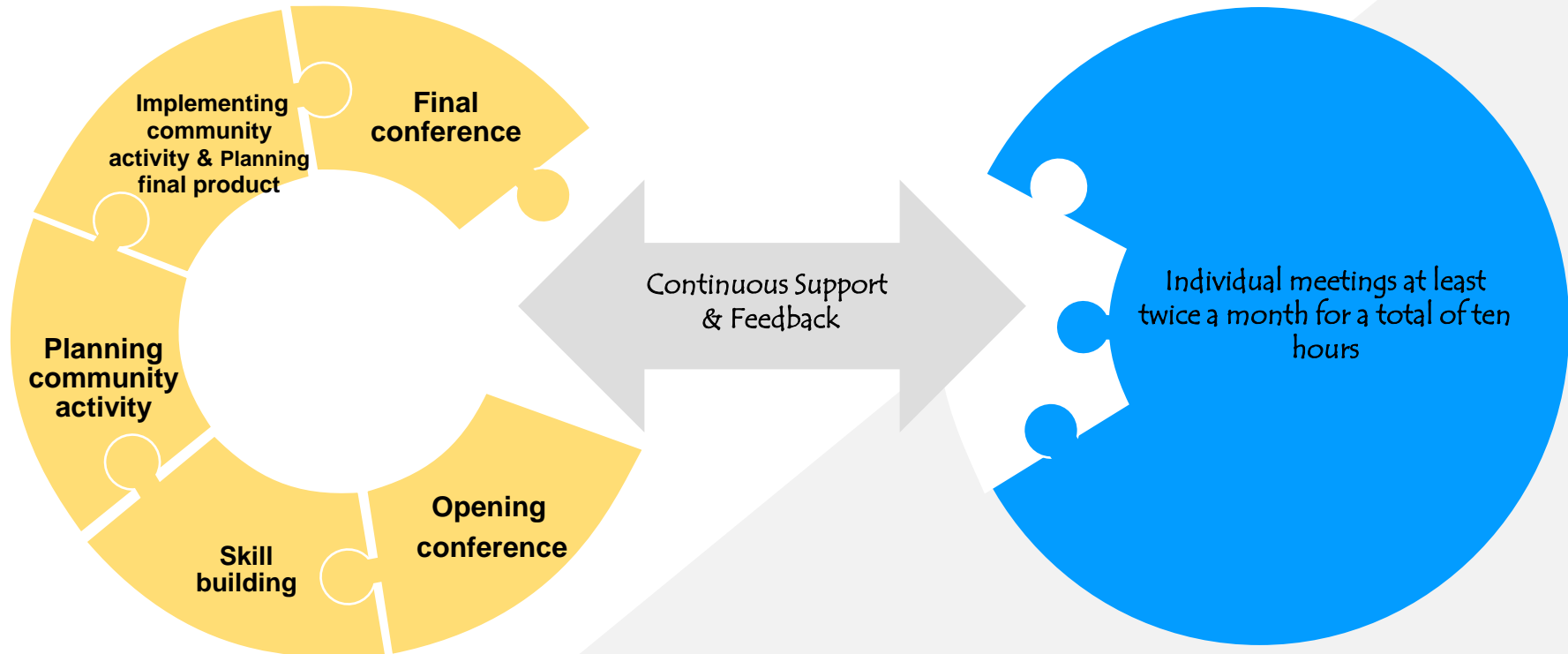


# Successful practices promoting 21<sup>st</sup> century skills

## Skill & Commitment Development

Zorman, Nadler, Zeltser & Bashan(2018)

## Talent Development



# Successful practices promoting 21<sup>st</sup> century skills

## Extraordinary Achievements in National Mentoring Program Zorman, Nadler, Zeltser & Bashan(2018)

- ✓ Present in professional conferences
- ✓ Publish work
- ✓ Participate in competitions and



- ✓ Continue to work with mentors
- ✓ Develop practical applications in science



- ✓ Create original work in music and arts
- ✓ Advanced study





2018

Thanks for Listening

**Dr. Rachel Zorman**  
Executive Director



**The Henrietta Szold Institute**  
The National Institute for Research  
in the Behavioral Sciences  
Jerusalem, Israel

[www.szold.org.il](http://www.szold.org.il)

# Thank You



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