



BOOSTING 21ST CENTURY SKILLS - INVENTION PEDAGOGY AND COLLABORATION

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Paula Huhtanen, craft artist

INVENTION PEDAGOGY - BUILDING A CULTURE OF COLLABORATION

- What kind of skills will children, youngsters and young adults need in their lives in a rapidly changing world?
- how can teacher educators equip their student teachers with the skills and competencies they need in guiding their future pupils in creativity and other 21st century skills?
- **co-creating, co-learning, and co-teaching**
- invention pedagogy and learning in creativity

Sources:
OECD 2016. Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills.
OECD 2018. The fuTure of education and skills. Education 2030.

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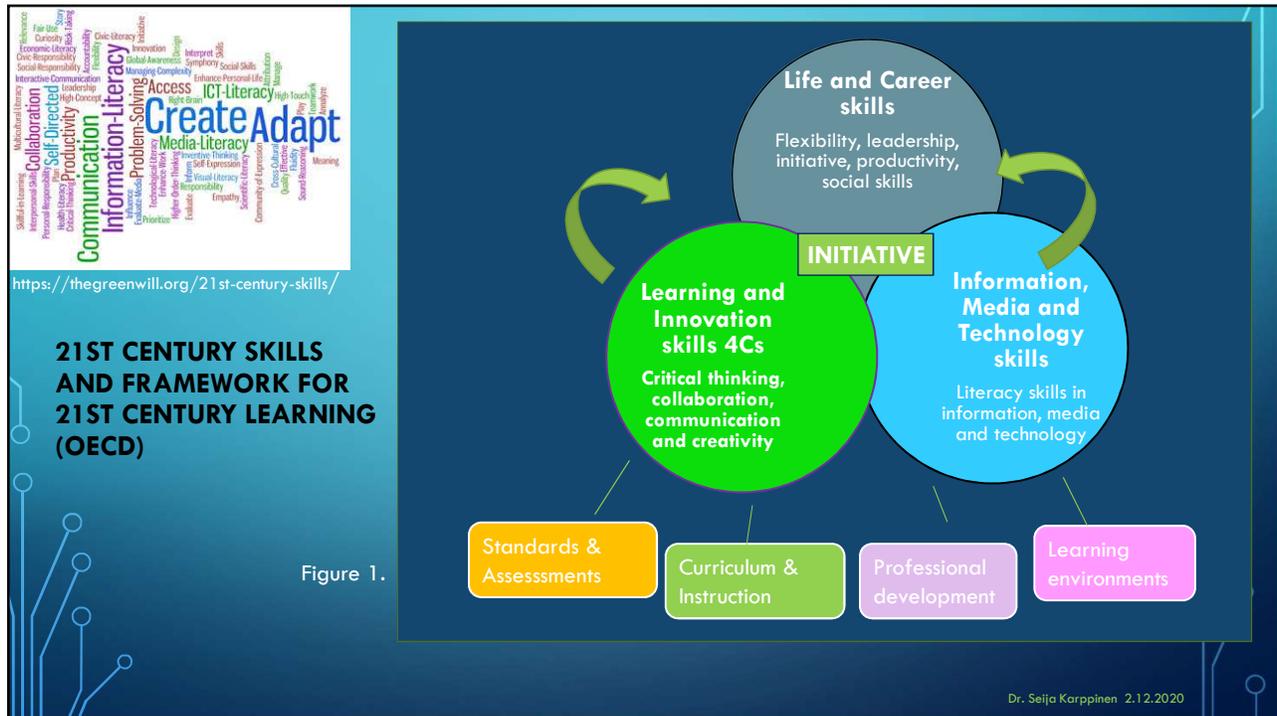


Figure 1.

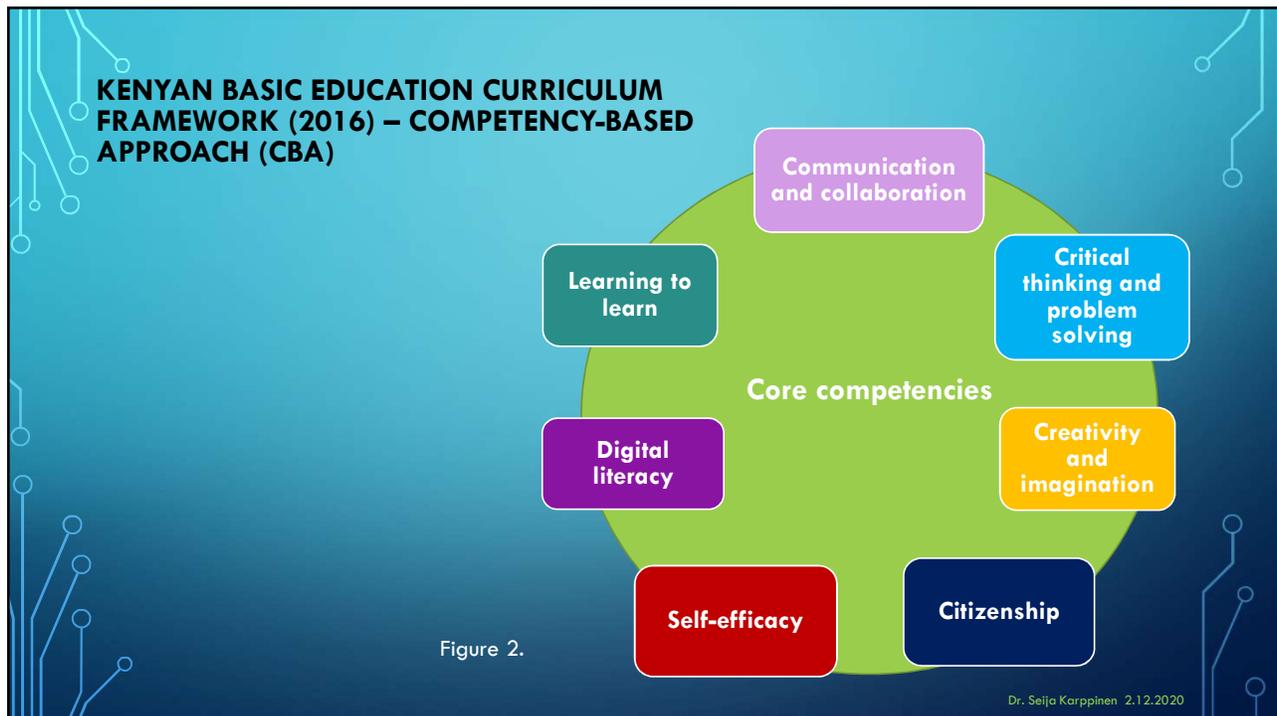


Figure 2.



Collaboration,
Creativity and
innovation

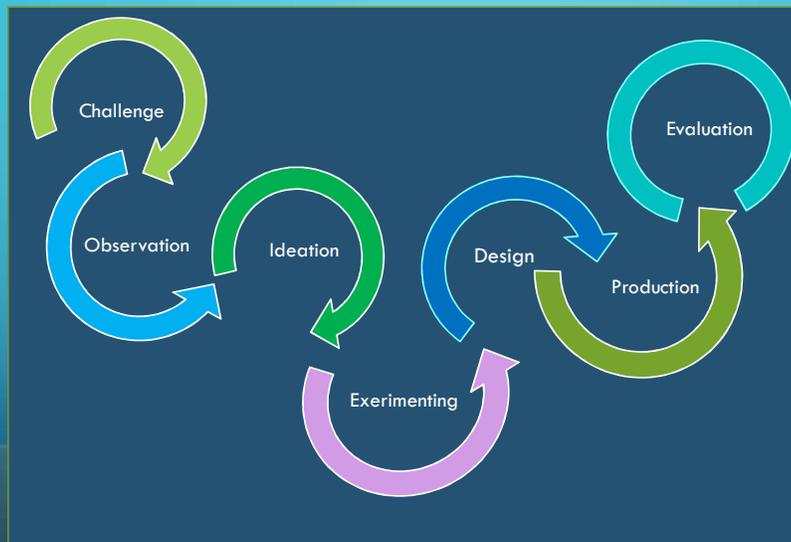
INTERDISCIPLINARY LEARNING

- An interdisciplinary approach refers not only to learning themes across disciplines, but refers to their relationship with the real world and an understanding of connections.
- As early as the 1840s William Whewell introduced a concept of consilience, which means the “linking of facts and fact-based theory across disciplines to create a common groundwork of explanation,” i.e., to find what they share in common and then create a complete picture (Wilson 1999)
- Creative links – to find them requires reflection, openness, initiative, creativity and associative observing skills.
- The combination of disciplines could be of any kind. The more unusual the combination is, the more interesting the work becomes.
- Multi-disciplinary projects



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INVENTION PROCESS IN SCHOOL



(Source: A tool for invention process in school developed by the City of Helsinki, Finland)

Collaboration and Creativity

PEDAGOGICAL ENERGY GAME

- Interdisciplinary collaboration between teacher education and elementary school and between primary student teachers and 4th grade pupils (10 year olds).
- Multi-disciplinary integration of physics, drama and crafts

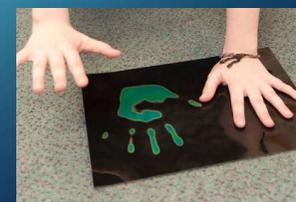


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INVENTION PEDAGOGY AND LEARNING IN THE DIGITAL ERA - STEM, STEAM, STREAM

- Invention pedagogy offers place for students to learn extensive skills through multi-discipline design processes
- Kind of processes fit to varied scientific, technological, engineering, artistic, and mathematical entities (STEM / STEAM / STREAM)
- Developing skills particularly required in 21st century changing society and labor market.
- STEM education is about strengthening students' content knowledge, inspiring their sense of curiosity, and giving them the tools and habits of critical thinking to understand the world around them in a holistic way.



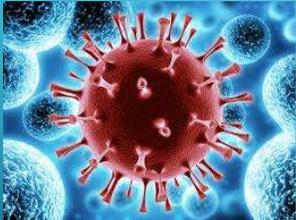
(e.g. Korhonen & Kangas, 2020; Korhonen et al., 2020; Karppinen, 2018; Kallunki et al., 2017; Kennedy & Odell, 2014; Al-Zahrani & Aly, 2016)

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EXAMPLE: EFFECTS OF CURRENT COVID-19 SITUATION

(Okhee & Campbell, 2020)



<https://www.csibehring.fi/lehdistotiedotteet/2020/covid-19-update>

- What Science and STEM Teachers Can Learn from COVID-19 ?
- Engaging K-12 students in complex societal problems like the pandemic
- Instructional framework that emerged out of the real-time responses of STEM professionals to explain the pandemic and find solutions.
- As a result the project made STEM subjects fascinating

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CONCLUSION

- Invention pedagogy, where making, creativity, sharing, invention, problem solving and imagination are at the focus, may I say, has potential to improve students' and pupils' skills required in today's society and labor market.
- In the best cases, it may also increase students' motivation in doing school work and enhance school satisfaction.
- Student-centered self-piloting and lateral learning, as opposed to a top-down model, is a much more authentic representation of how learning happens in everyday life.
- Invention-driven creation may also encourage and develop curious mindsets, and initiates students for problem solving and new innovative processes.
- Interdisciplinary teaching and learning activities provide an opportunity for active student and teacher teamwork.

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THANK YOU !



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