

# Digital transformation of education in Estonia

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# Educational statistics of Estonia

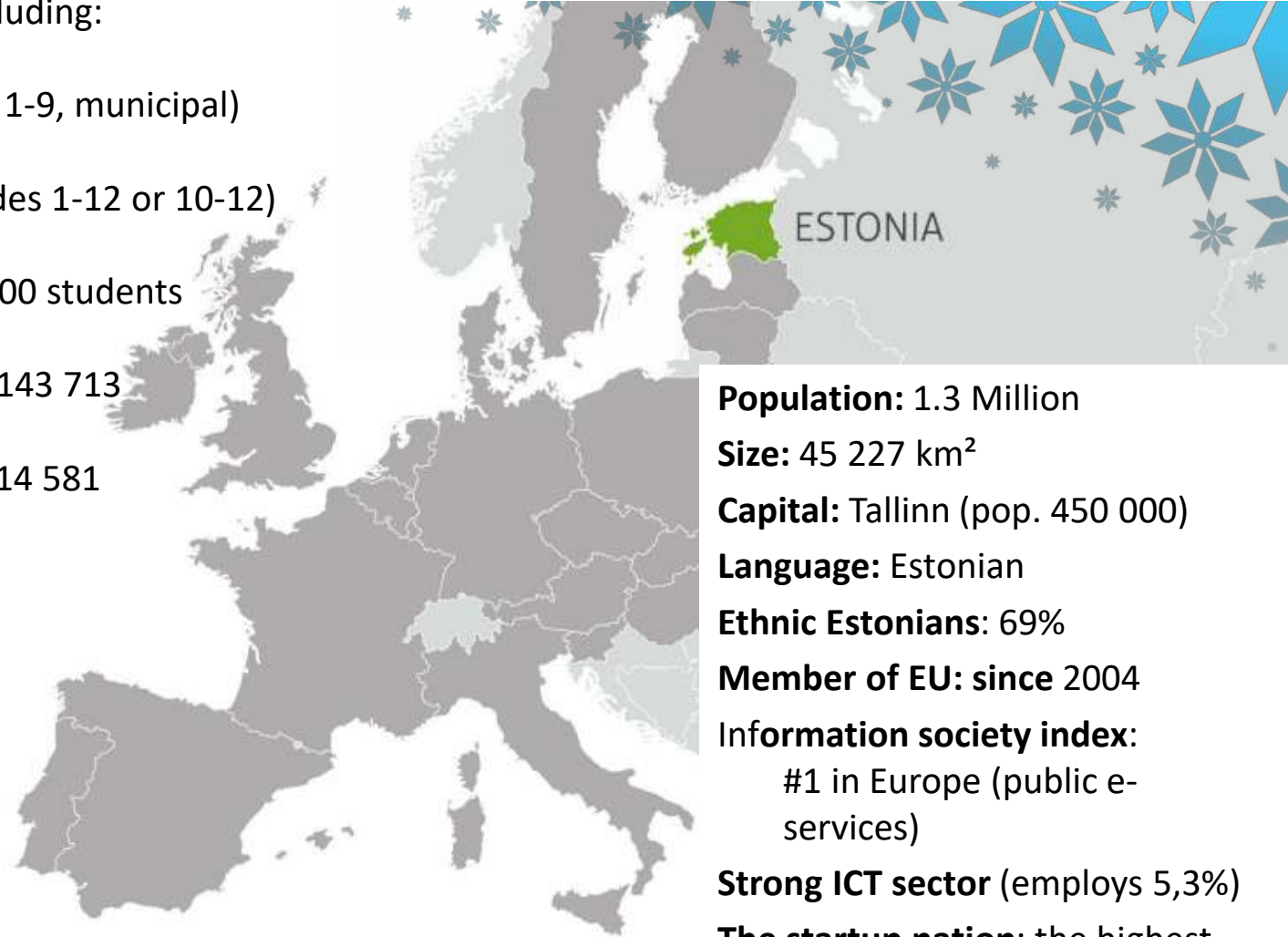
Number of schools: 530, including:

- 351 basic schools (grades 1-9, municipal)
- 143+21 high schools (grades 1-12 or 10-12)

50% of high schools have <100 students

Number of students (K-12): 143 713

Number of teachers (K-12): 14 581



**Population:** 1.3 Million

**Size:** 45 227 km<sup>2</sup>

**Capital:** Tallinn (pop. 450 000)

**Language:** Estonian

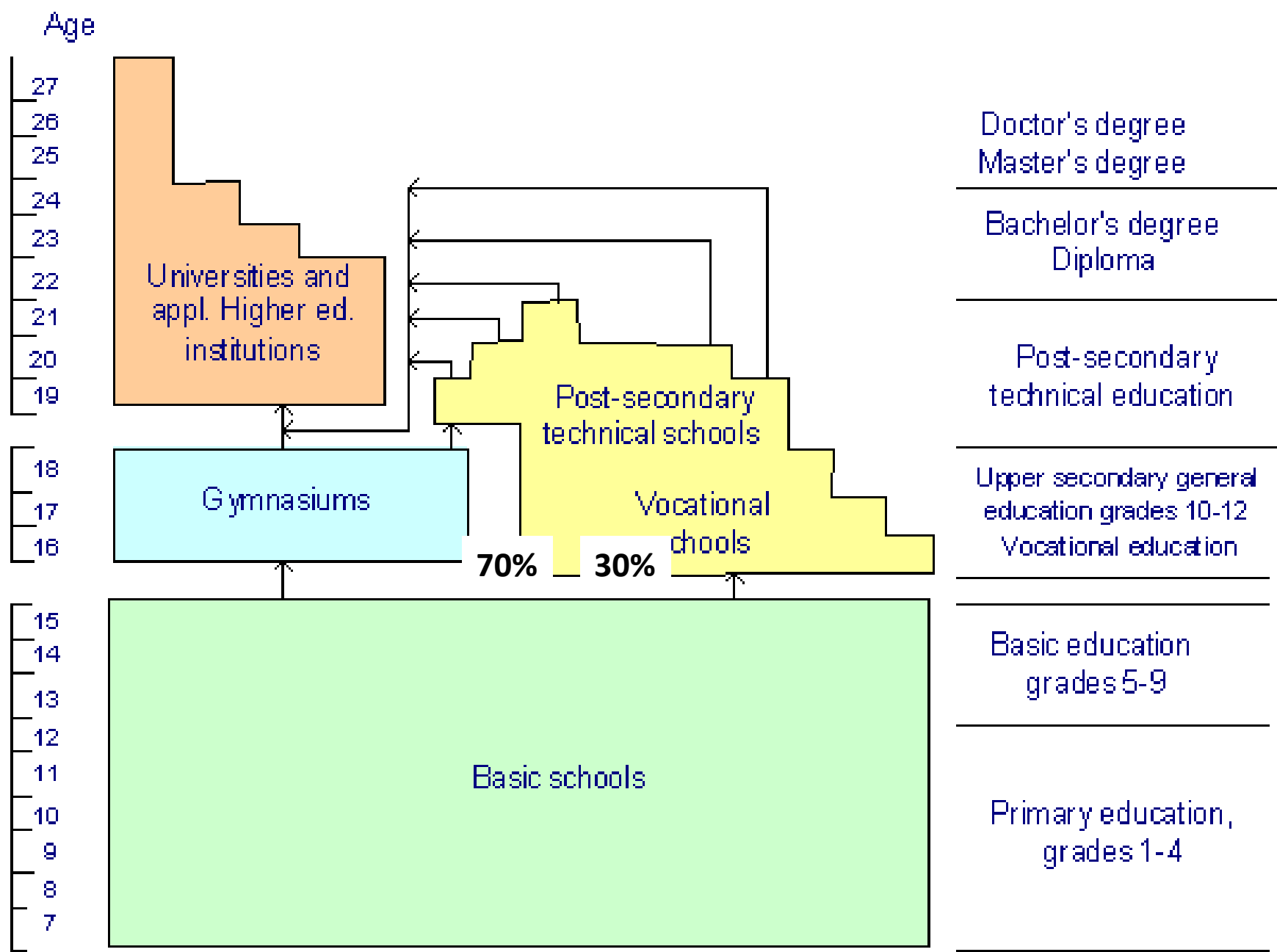
**Ethnic Estonians:** 69%

**Member of EU:** since 2004

**Information society index:**  
#1 in Europe (public e-services)

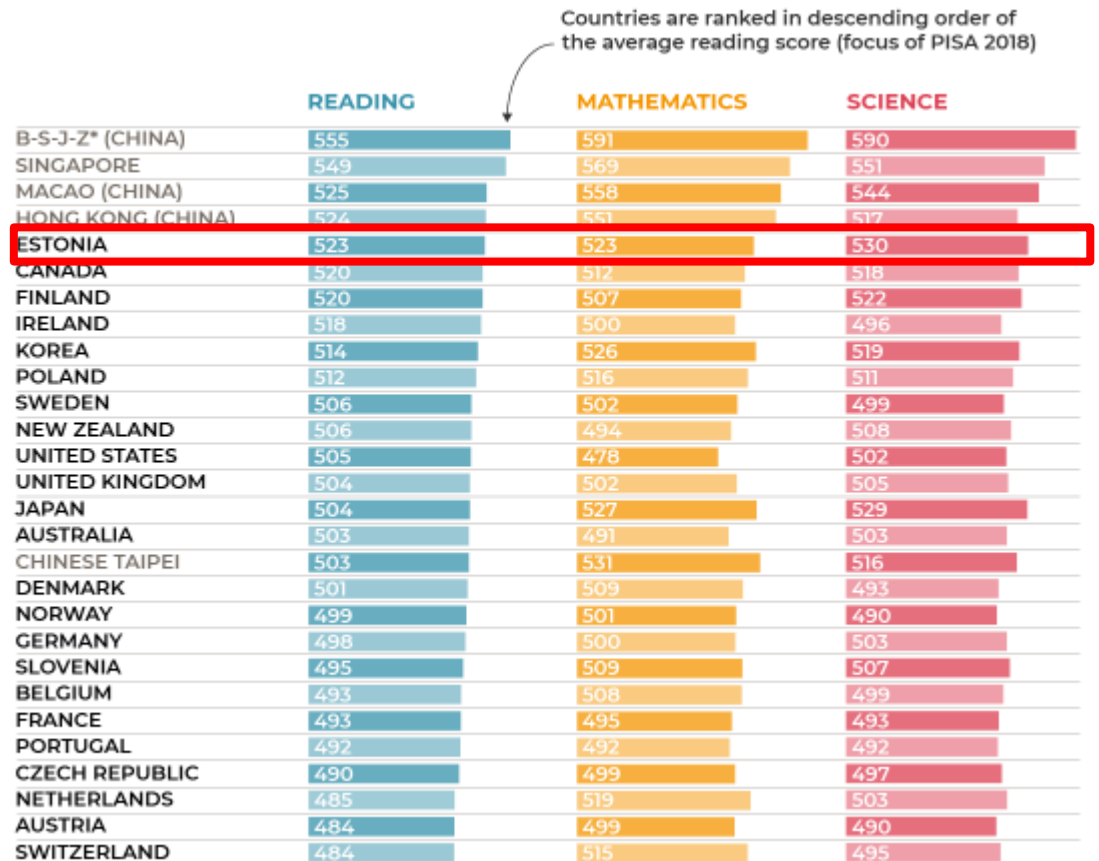
**Strong ICT sector** (employs 5,3%)

**The startup nation:** the highest number of IT-startups, Skype  
Home of EU IT Agency & NATO  
CDC



# OECD PISA study 2018

- Estonian 8<sup>th</sup> graders ranked on top in EU for Math, Science, Reading skills
- Estonian students:
  - Student's socio-economic background has small impact on performance
  - 70% of Estonian students are satisfied with their life
  - 70% of Estonian students want to acquire higher education
  - Believes in technology, is active digital device user and reads online news regularly



# Educational policy reforms

- National curricula: 1996, 2001, 2011, 2024?
- School autonomy, no school inspectorate
- Tiger Leap school digitalisation program: 1996, 2001, 2006
- External evaluation (state exams): 1997
- Online exams, level e-tests, diagnostic e-tests
- Lifelong Learning Strategy 2014-2020: pedagogical paradigm shift, digital turn in schools, teachers' qualification
- National Strategy of Education 2021-2035: flexible learning paths, access to education

National Strategy of Education 2035: <https://www.hm.ee/en/activities/strategic-planning-2021-2035>

National curricula: <https://www.hm.ee/en/activities/pre-school-basic-and-secondary-education>

# School autonomy

- Schools are autonomous, principals have extensive rights to arrange life at schools (curriculum, teachers' salary, budget)
- Every school tries to build unique identity
- Accountability: sample-based e-tests in grades 4 - 7, exams in grades 9 and 12
- Policy of inclusive education
- Schools have to provide free access to social pedagogues, speech therapists, psychologists, etc for students with special needs

# Teachers

- Teachers select teaching methods and textbooks
- All teachers are required a master's degree (81% have)
- 1% of school's payroll budget goes to CPD
- Many free in-service training courses available
- Mentoring system for novice teachers and principals
- Teachers' average age is 49, 86 % are female
- 86% of lesson time is spent on teaching and learning
- Salaries have increased 70% over the past 7 years, priority is to make teachers' profession more attractive

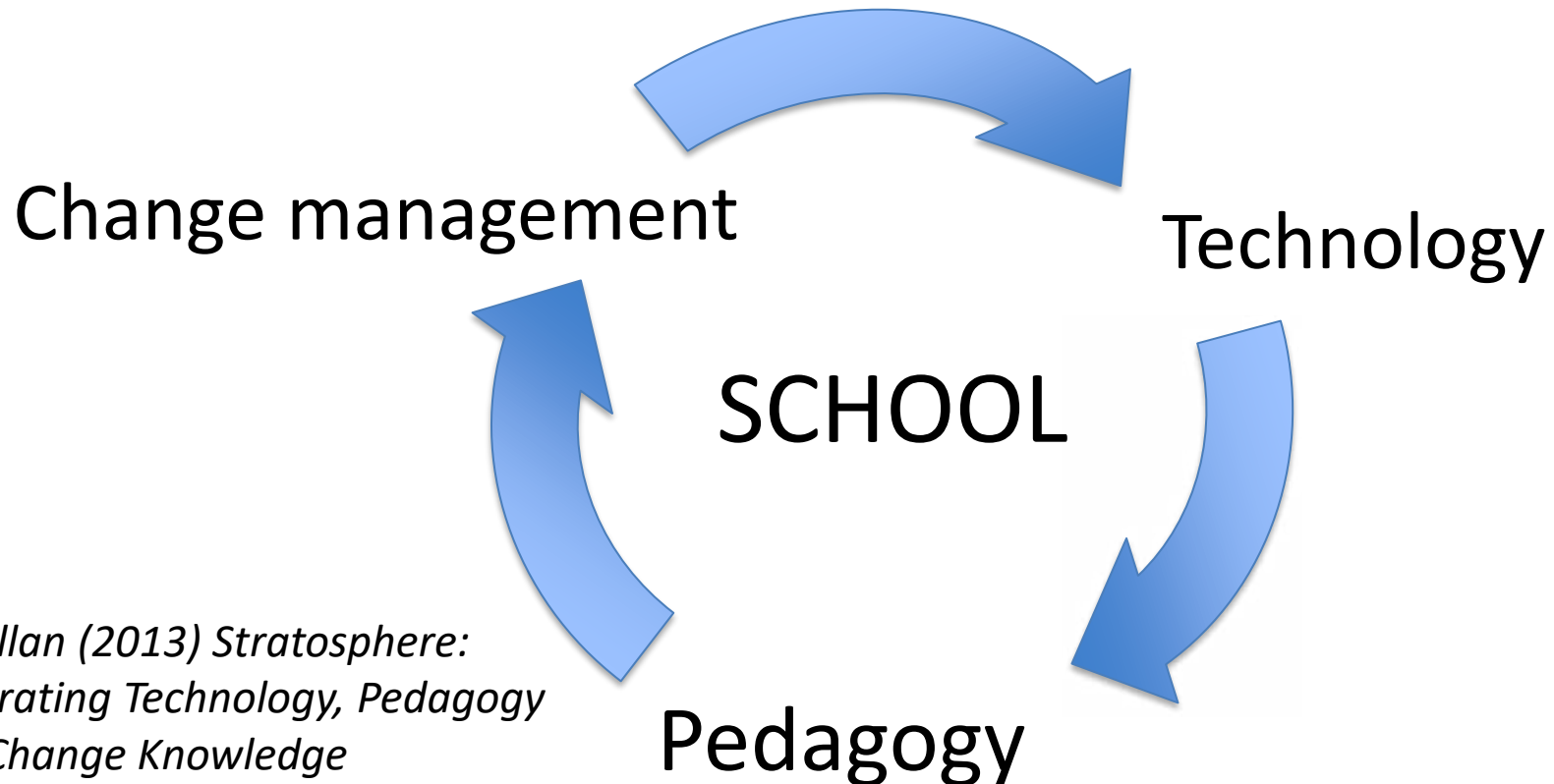
# Strategy for Lifelong Learning 2014-2021: action plan for Digital Turn in Estonian schools

- **Digital turn in formal education system:** digital culture in schools, bottom-up innovation, sharing good practice, educational technologists in schools
- **Digital learning resources:** digital textbooks, OER, quality management, recommender systems
- **Digital infrastructure for learning :** 1:1 computing, BYOD, interoperable ecosystem of services, mobile clients, access to fast network anywhere
- **Digital competences** of teachers and students: competence models, self-assessment tools, mapping with course offerings and accreditation procedures, updating initial teacher education curricula



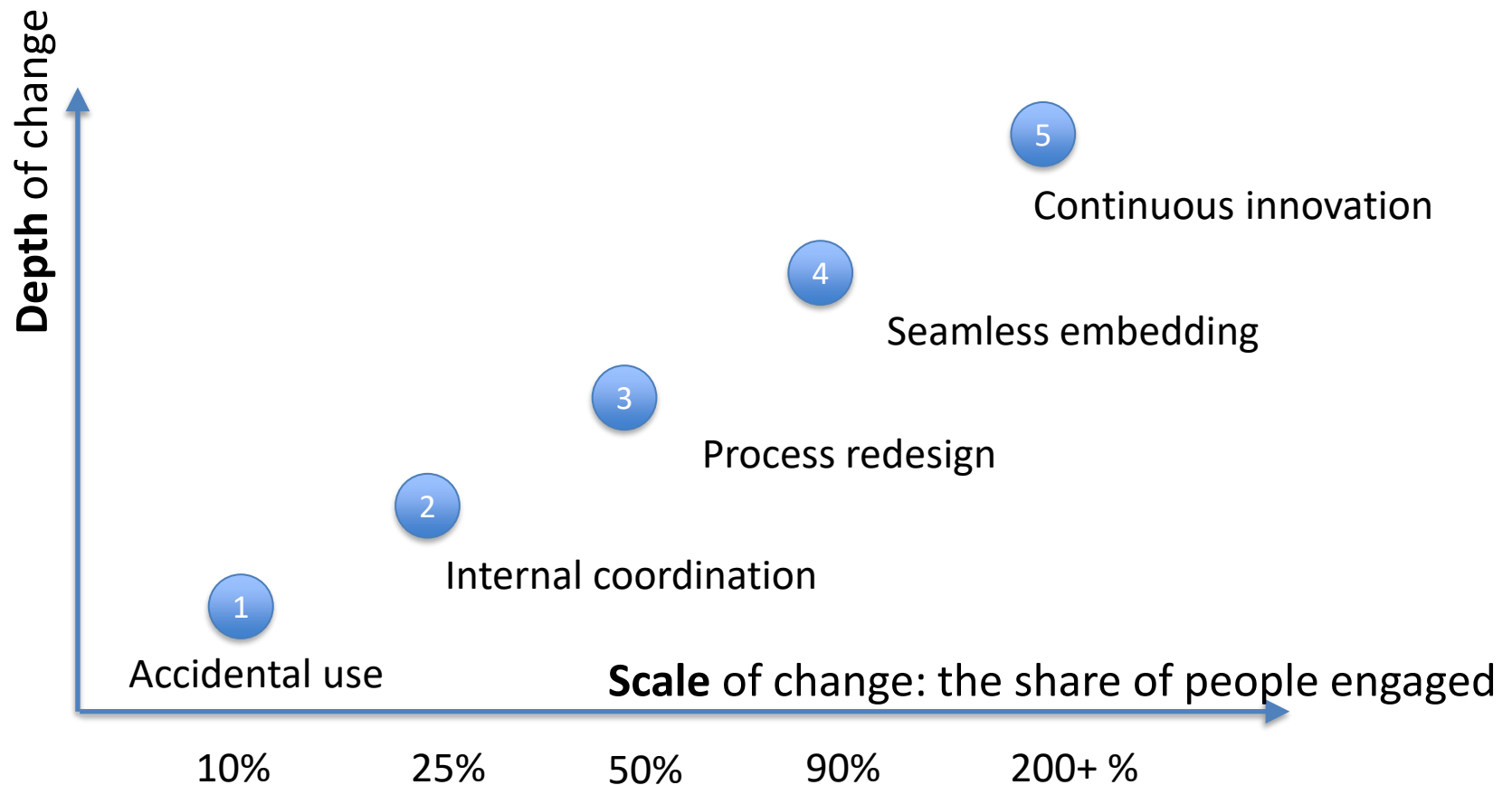
# Three pillars of educational change

- Successful educational innovation requires combination of three forces on the school level:

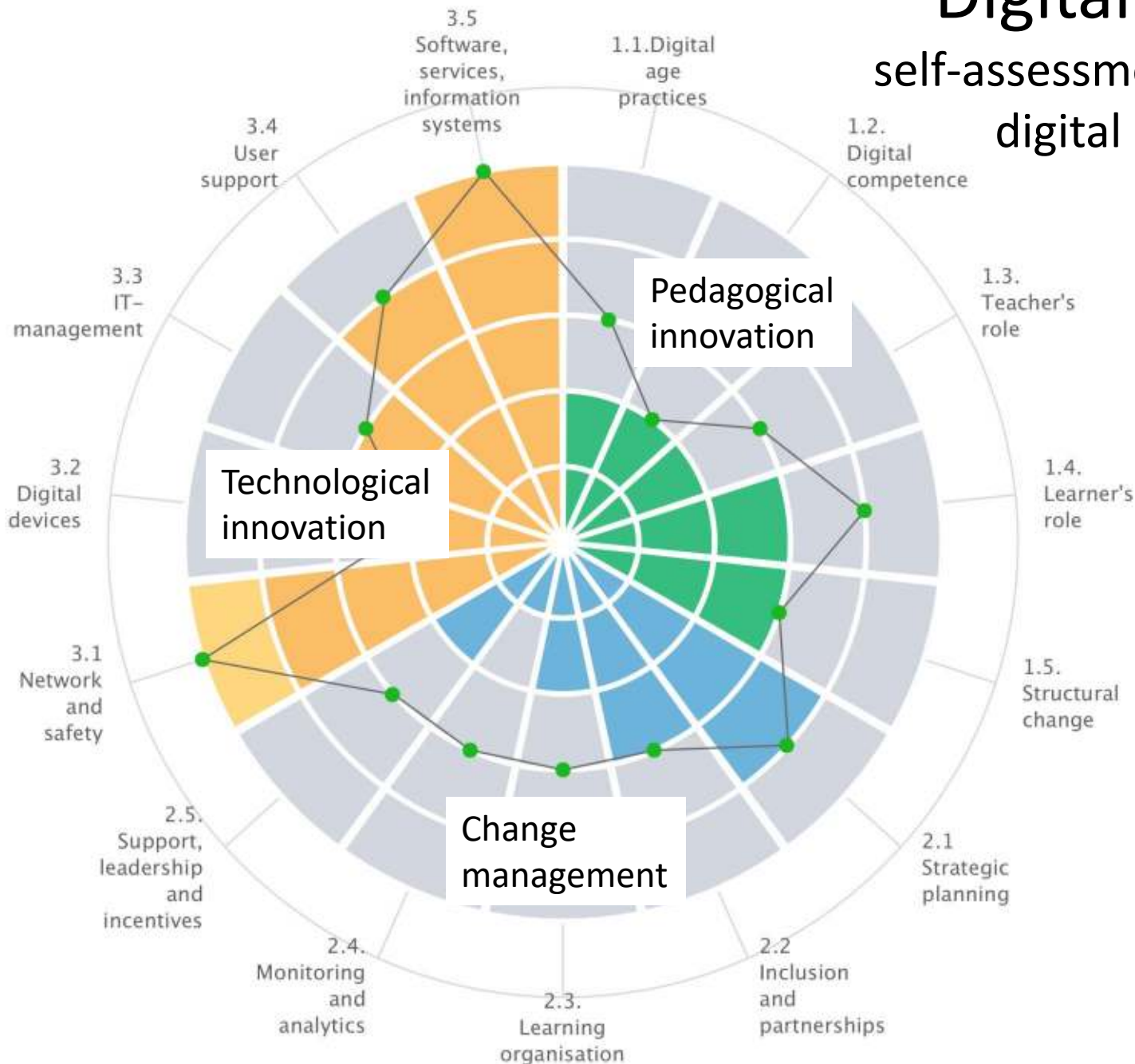


*M.Fullan (2013) Stratosphere:  
Integrating Technology, Pedagogy  
and Change Knowledge*

# Levels of digital turn in school



# Digital Mirror: self-assessment of schools' digital maturity



- Self-assessment:
- By the principal
  - By digi-team
  - By peer team

- Data-driven decision-making:
- Benchmarking
  - Strategic goals
  - Action plan
  - School-owners' digital strategy

# Digital STEAM projects in Estonia

- Coding [Kandinsky](#) in Russian Central Gymnasium
- [DigitalNatureTrails](#) in Kolga School
- [DroneLab](#) in Pelgulinna Gymnasium
- [Stratosphere](#) project at Väätsa school
- Innovatoorium (STEAM exploratory IoT lab):
  - Room sensors (climate, security)
  - Wearables (smart fashion, health)
  - Mobile science labs (PocketLabs, hydroponics)
  - Digital art kit (VR, AR, 3D)



# 3 generations of digital learning resources

DISTRIBUTION

**Gen 1: 1998**



**Gen 2: 2008**



**Gen 3: 2018**



TYPE

Desktop software

Downloadable files (MS Office)

Embeddable online resources, e-textbooks, apps

SCALE

20 \$ + 10 OER

30 \$ + 8000 OER

5000 \$ + 20000 OER

**Printed catalogues**

**Teachers portal  
Koolielu.ee**

**Online catalogue  
E-koolikott.ee**

# The learning resource platform

LOM-based Learning  
Object Repository &  
authoring tool

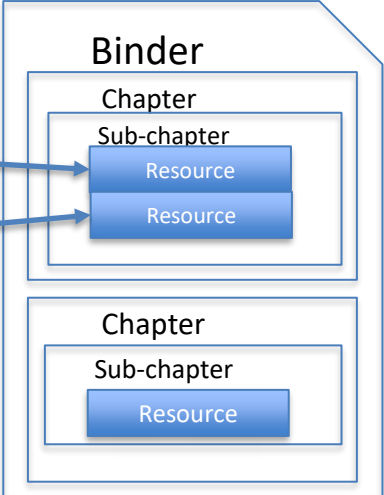
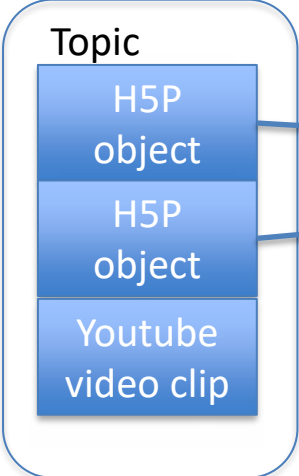
The national catalogue of  
digital learning resources

Drupal 7 +  
Metadata  
Taxonomies  
OAI-PMH



Single Sign-On:  
ID card, mID,  
SiS



H5P +  
Math support  
New templates




Metadata  
harvesting


LearningLocker  
xAPI Learning  
Record Store

# Showcase: e-Koolikott.ee (e-Schoolbag)

 Otsi pealkirja (sh peatüki pealkirja), kirjelduse, võtmesõna, autori, väljaandja järgi Filter 

**Kasutusjuhendid**

Minu asjad 

**Ringjoone võrrand** 

- 9.1. Ringjoon ja selle võrrand \*-\***\***
- 9.2. Ringjoone üldvõrrand \*\*-\***\*\*\***
- 9.3. Ringjoone ja sirge vastastik...
- 9.4. Ringjoone võrrand kolme p...
- 9.5. Ringjoon, sirge ja vektor (ül...

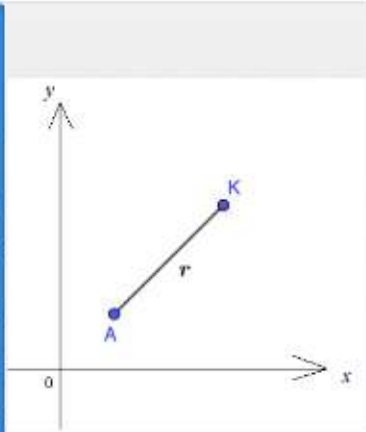
## 9.1. Ringjoon ja selle võrrand \*-\***\***



Tutvu teoreetilise osaga ning lahenda interaktiivsed ülesanded.



### 1. Ülesanne


Leia punktide  $A(a; b)$  ja  $K(x; y)$  vaheline kaugus  $r$ .

- $r = \sqrt{(x-a)^2 + (y-b)^2}$
- $r = (x-a; y-b)$
- $r = \sqrt{(x-a) + (y-b)}$
- $r = (x-a + y-b)$
- $r = (x-a)^2 + (y-b)^2$
- $r = (x+a)^2 + (y+b)^2$





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Tasuta digiõppekesk... 

Digiõppevara... loodusvaldko... T. Sarapuu 

Digiõppevara... sotsiaalvaldko... M. Naalainen 

Informaatika digiõpikud I ja... K. Rahn 

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