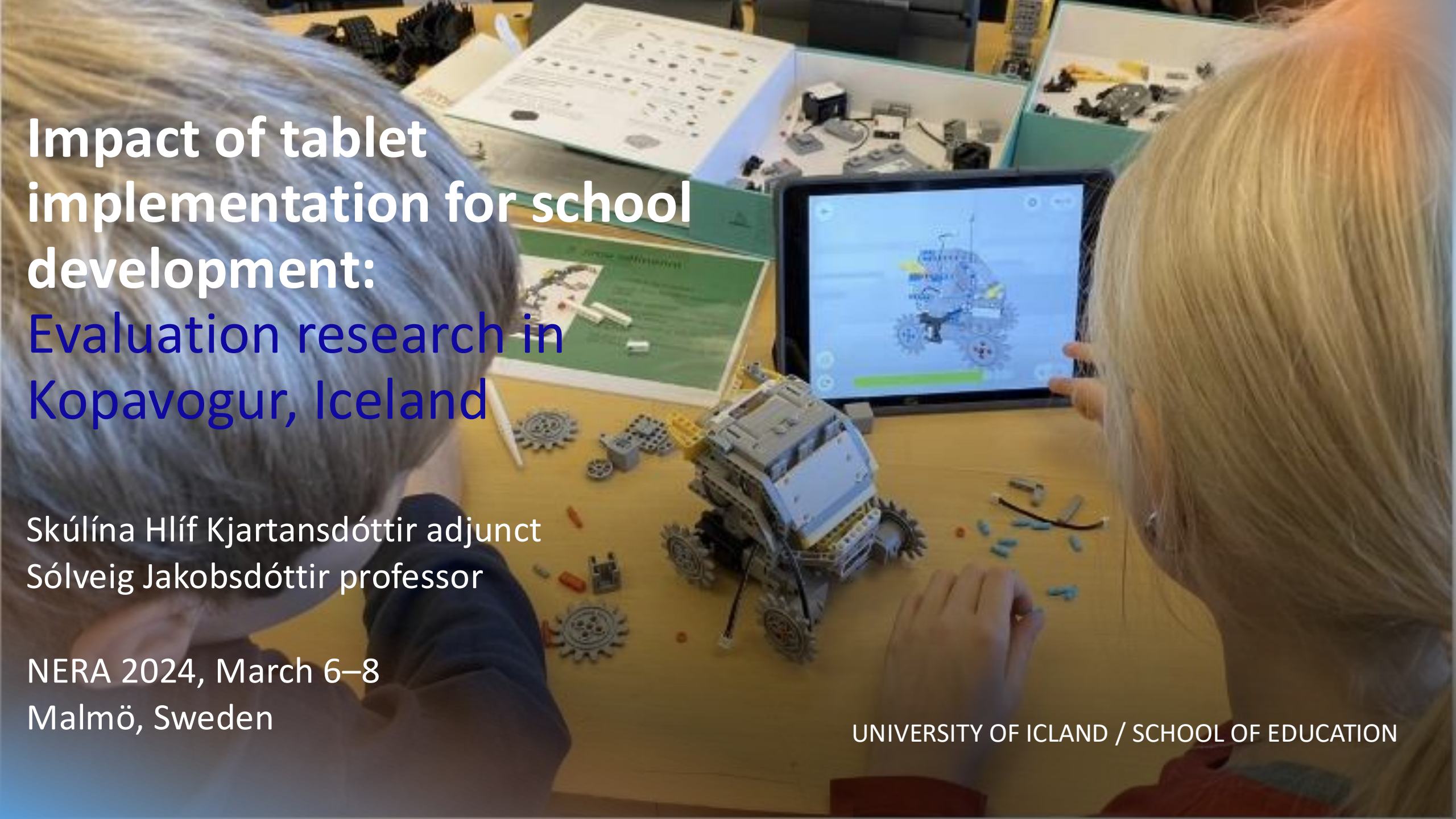

Impact of tablet implementation for school development:
Evaluation research in Kopavogur, Iceland

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NERA 2024, March 6–8
Malmö, Sweden

UNIVERSITY OF ICLAND / SCHOOL OF EDUCATION

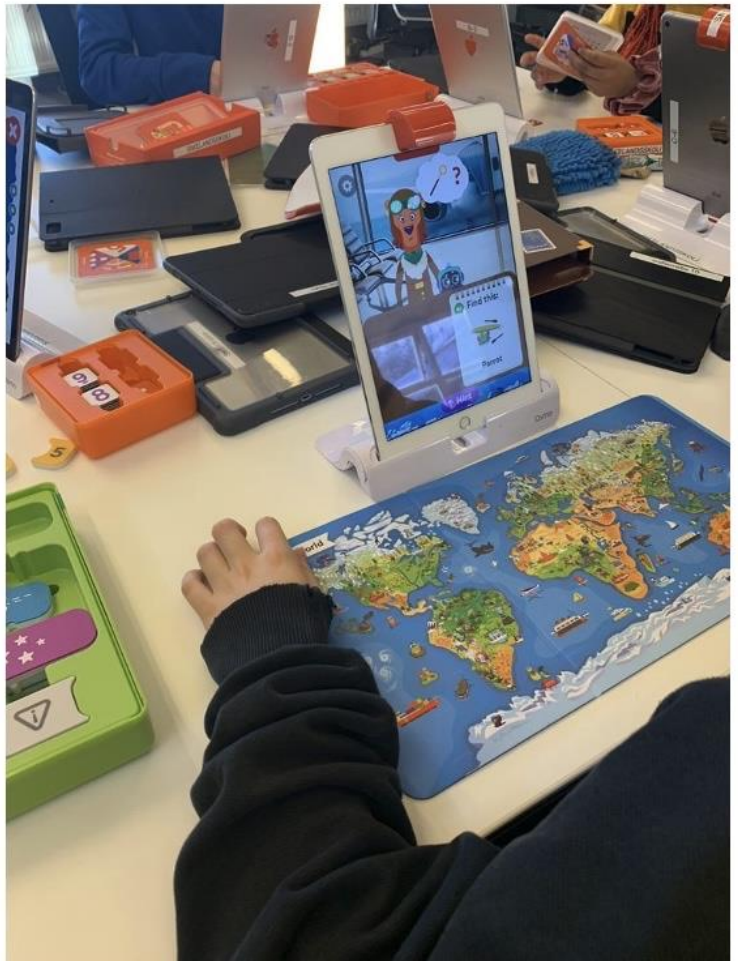
Evaluation study

Kópavogur Municipality 9 schools: Tablets for 1:1 learning grades 5-10, 2015+

Evaluation study 2021-2022: Effects of tablet integration on teaching & learning

Surveys in 9 schools w. teachers (425), students (2513) and parents (1046); SELFIE

Classroom **observations** - **3** schools: photos, recordings, stories; Interviews - principals, students (36), teachers (50)



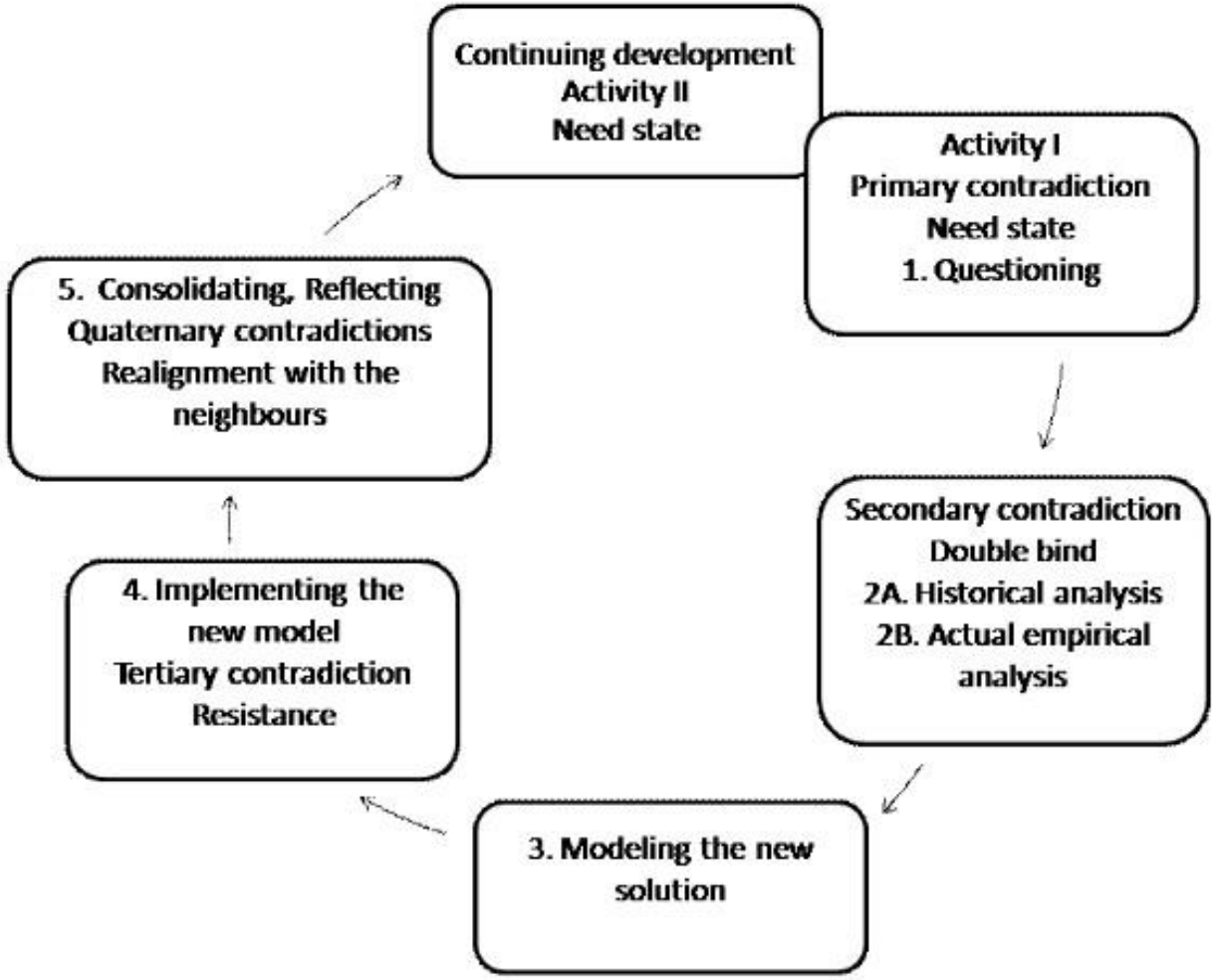
Aim of the research

- Main aim to explore the impact of tablet use on students, regarding:
  - Satisfaction and interest in learning, personalisation of learning, responsibility in learning and empowerment.
  - Information literacy, technology literacy, media literacy, digital competences and learning achievements.
- Other aims to explore the changes to teachers' digital competence, professional development, organisation of teaching, variations in teaching methods, teachers' collaboration, as well as the cooperation of schools and parents on aspects of learning.
- In this presentation we will focus on aspects of school development.

Expansive learning cycle

(Engeström, 2001)

1. **Collective, artifact-mediated and object-oriented activity system:** is the unit of analysis
   - seen in its network relation to other activity systems
2. **Multi-voicedness of activity systems:** is characteristic of the system
   - Different opinions, traditions and interests at play
3. **Historicity:** activity systems take shape and get transformed over lengthy periods of time.
   - Problems and potential – can only be understood against their own historicity.
4. **Contradictions:** as source of changes and development
   - they cause **friction and tensions** inside and between activity systems
5. **Expansive transformations:** are achieved when participants reconsider the objectives of the activity systems to obtain a wider perspective on the potential of the activity, that were not possible before.



Expansive learning cycle, adapted from Engeström (2001) by Jóhannsdóttir (2010)

Tablets in Kópavogur

Historical Context

Micro computers

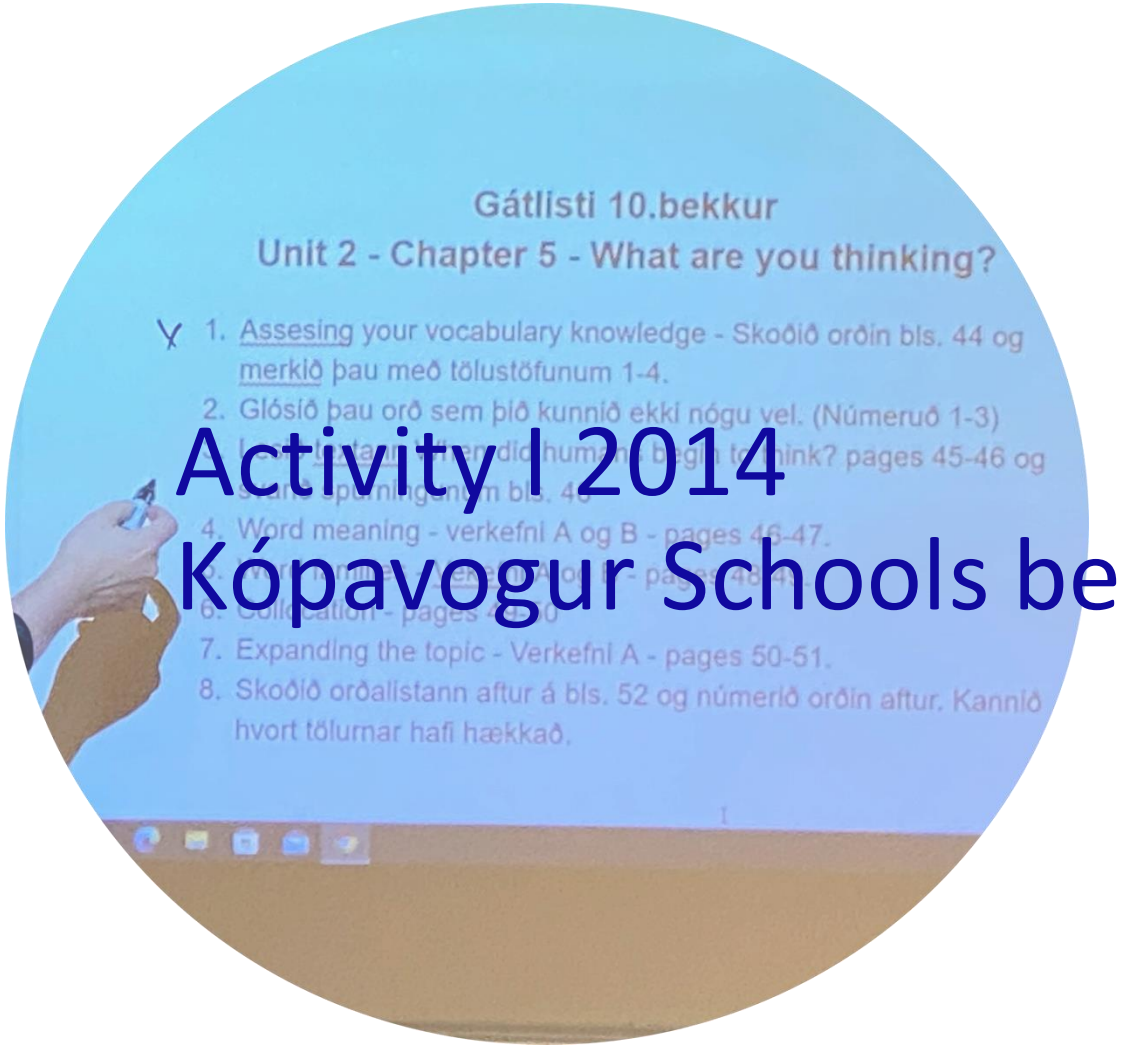
Internet, laptops, ICT

Social media Smart devices

4th Industrial revolution

New net wave

Year	Education - emphasis	Implementation in schools
1983	Computer Lit. Tech. Lit.	Educational software, User software - office suite
1990	Media and information lit. Multi-modal lit.	Communication projects, Kidlink, Jason, eTwinning Laptops, 1:1 (Upper sec schools) DE, online and blended learning New curriculum, policy, teacher ed.
2007	Share, participate	Teacher PD, digital habits e.g. via social media; Educamps/teachmeets Research on T&L primary/lower secondary level: Limited ICT Mobile learning & tablets in schools 1:1 **Tablets in Kópavogur**
2011	Agency Digital citizenship	
2016	Maker literacy Dig. competence Pers. protection	Coding in schools STEM/STEAM Makerspaces
2020	Online literacy Data literacy Algorithm lit. Health and wellbeing	Schools closing - because of COVID Increase of distance and online learning at all school levels Personal protection - software evaluation



Activity I 2014
Kópavogur Schools before tablets

1. Questioning
Primary contradiction – Need state

- Tablets and other smart devices emerge in schools often with 1:1 learning emphasis.
- First studies indicate various positive effects and posibilities for learning (EU studies, SHK/SJ study on Icelandic early tablet project Nordlinga School). Nordic research network (NordLAC) emphasises agency, participatory pedagogy, learner empowerment, connected learning and learning across contexts
- Are we educating learners in accordance with global and societal changes and the basis in our laws and national curriculum?

  Our economy is increasingly based on technology and tech-minded people with inquiry orientation in their acquitition of knowledge but at the same time have much adapability, show initiative and self confidence for collaboration and team work. At the same time the main work tools waiting for students in schools are books and pencils. Students are required to enter a vanishing world in spite of a mandate to educate them for the future – and that a majority of them will in all likelihood have jobs that do not exist today. In addition, students' project work at school is often not connected to their daily life. (Björn Gunnlaugsson et al., 2016)

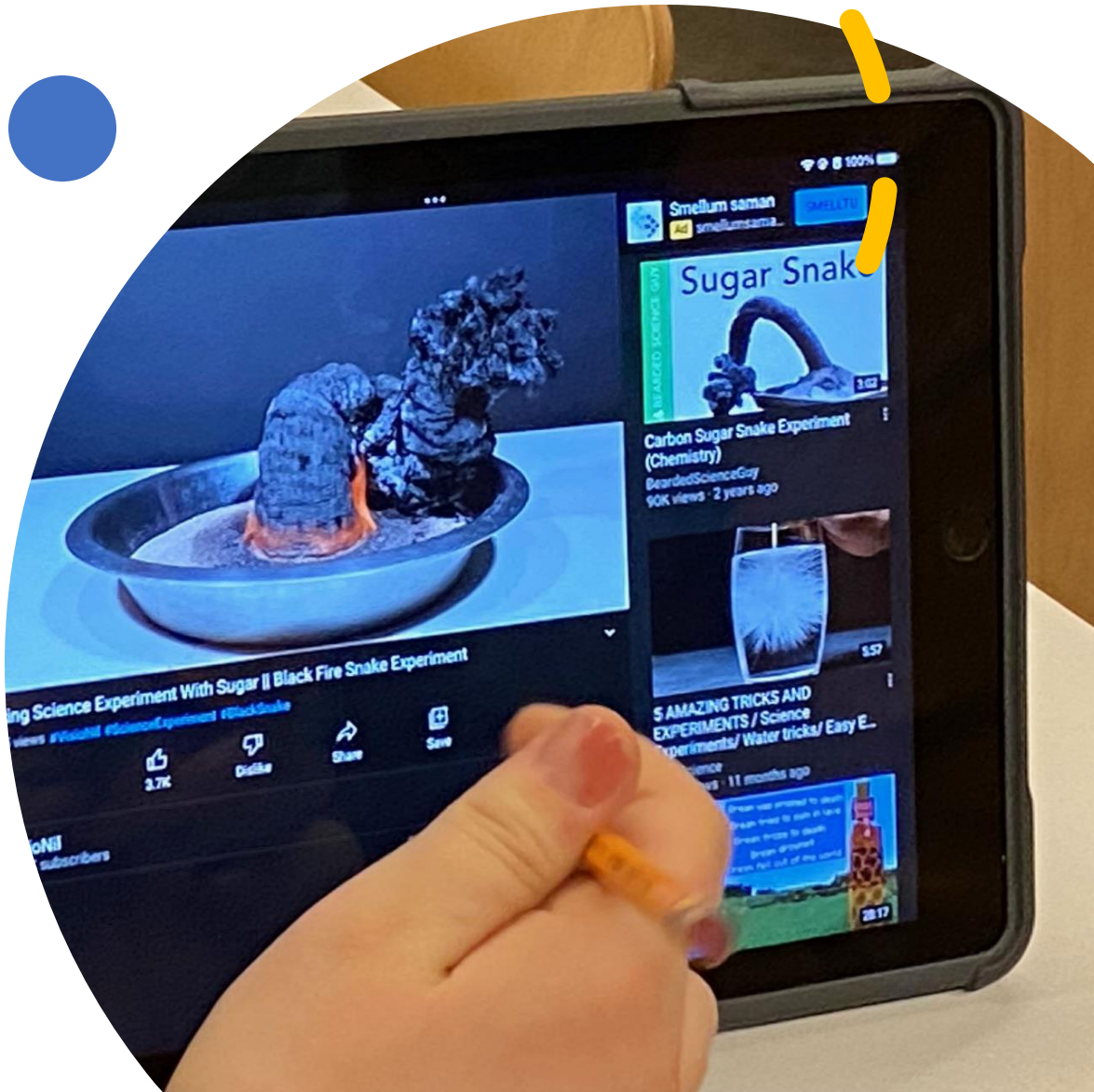
2. Historical analysis – Actual empirical analysis

Secondary contradiction - Double bind

- Study on teaching and learning in Icelandic primary/lower sec schools 2009-2011 revealed outdated computer equipment and limited use of learner computer use - similar to a large EU study.
- Teaching practices and learning materials/resources had hardly changed for a long time
- High cost of computers and technology
- Level of knowledge not high in the education system – many with interest but few teachers knew tablets well and their possibilities for learning.
- The upper secondary school in Kópavogur was one of the first schools at that level that required students to use laptops for learning (1:1)
- Political will emerges to provide students with tablets at the lower secondary/primary level with emphasis on changing teaching and learning practices. This is in line with a global trend of similar projects in school districts across the globe and even whole countries intitiatives.

3. Modeling the new solution

- Based e.g. on
  - Former projects in Kópavogur (1 school BYOD)
  - Former projects in other Icelandic schools (iPad o.fl.) and abroad (e.g. via school visits)
- Steering group and "Tablet team"
  - Special project leader hired with experience and connection with earlier projects as well as teaching councellors with a background in ICT in education
  - Workshops and information for teachers
- Leadership teams in schools
- Special emphasis on digital citizenship and information for parents and students



4. Implementing the new model
Tertiary contradiction - Resistance

- Project was mainly based on top-down decisions - perceived by many to start too quickly in spite of considerable preparation.
- Parents and teachers: almost unlimited access to apps and social media causes tension.
  Result was that access became more limited and ownership of computers changed (from possibilitied for student/parents to purchase the computers – ownership stayed with the schools).
  Increased emphasis on the computer as a learning device.
- Critical voices from teachers and parents:
  - Many students use the tool too much for games (not for learning/school projects) at schools and at home
  - Doubts about the tool's usefulness regarding e.g. keyboarding
- Many parents and teachers openly display forceful negative reactions.

5. Consolidating, reflecting

Quaternary contradictions.
Realignment with the neighbours

New tech wave – 4th industrial revolution – Increased emphasis and multimedia and coding.

- Central "tech resource bank" with software and equipment established for the 9 schools
- Makerspaces established in some of the schools

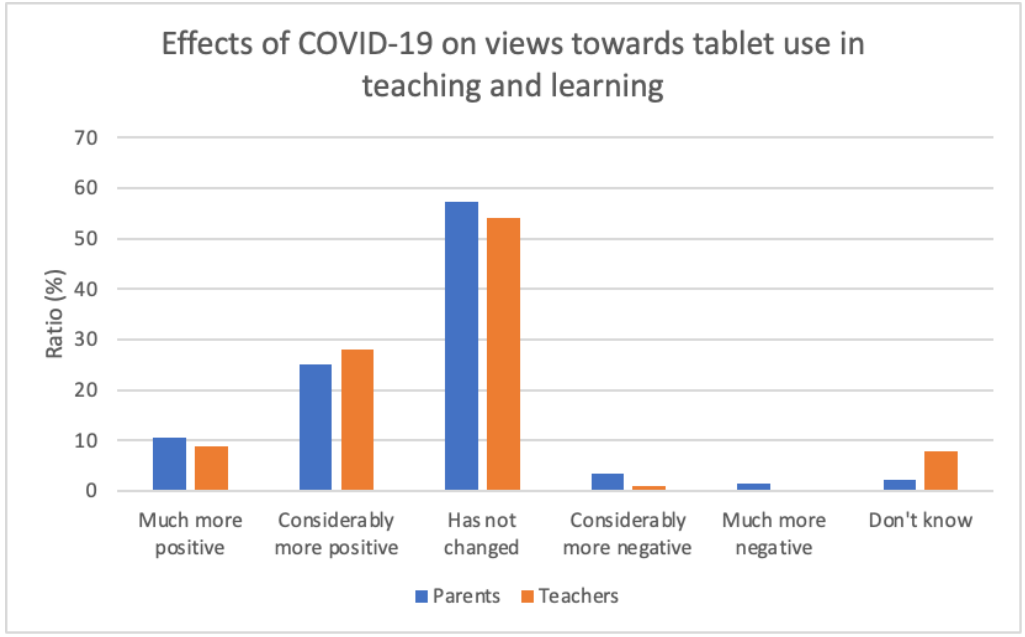
Learning community shares experience, e.g. via educamp workshops/teach meets and via social media.

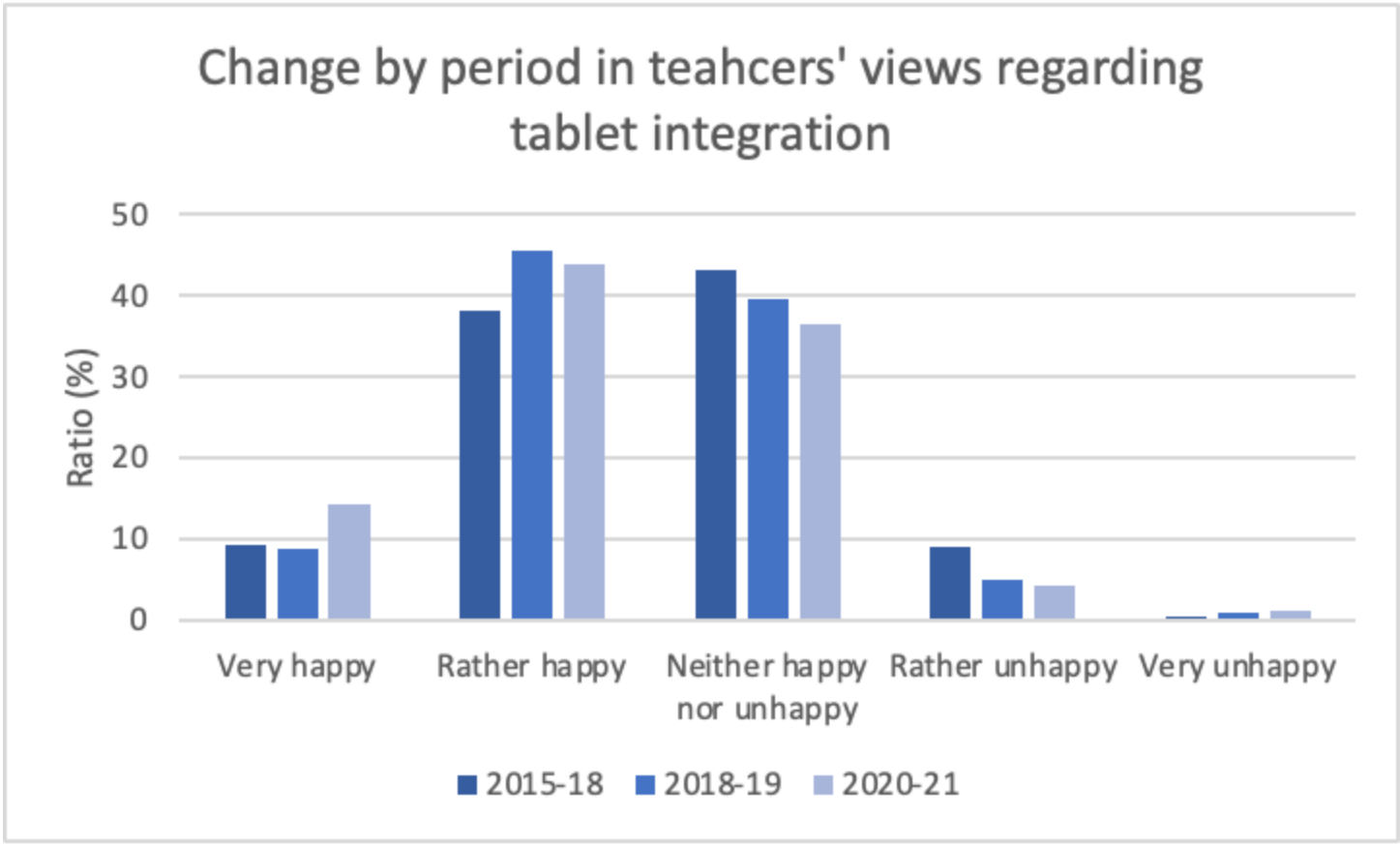
5. Consolidating, reflecting - continued

More parents appear happier with time; teachers do not want to "go back"; students happy

"Stress test" in COVID – tablet a savior but some critical voices emerge regarding distance education and online learning methods and tool's affordances

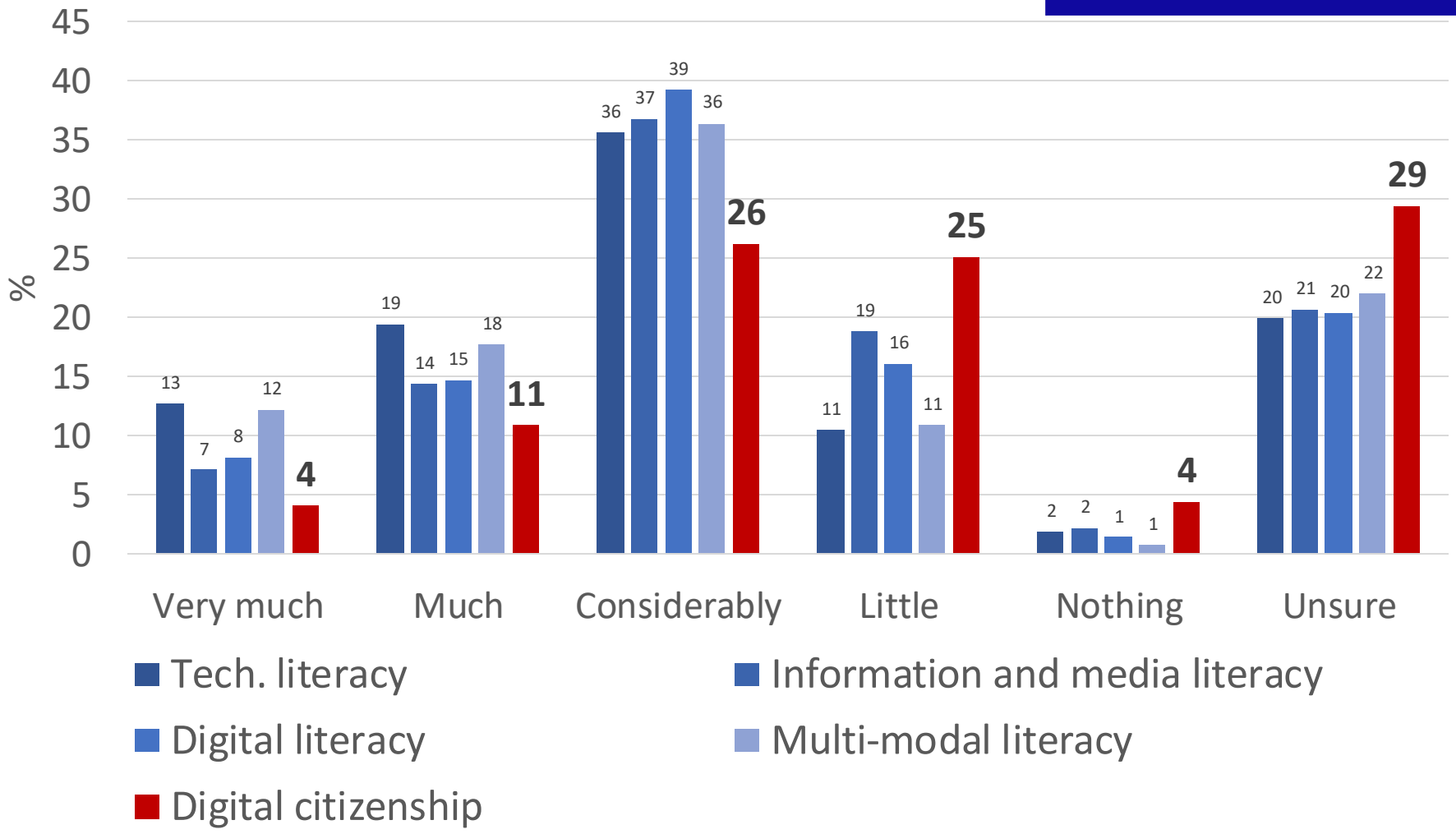
(1) 2015-2018 (steering group); (2) 2018-2020; (3) 2020-2022 (COVID)





5. Consolidating, reflecting - continued

- Questions emerge regarding continued development, vision & policy; role of the "Tablet team"
- Reflections and consultations with outside experts – evaluation study
- New project manager hired after the first three years initiation phase – a certain vaccuum
- Digital citizenship – who should manage such education – does it work? Collaboration with the Icelandic inSAVE project/Home School Association



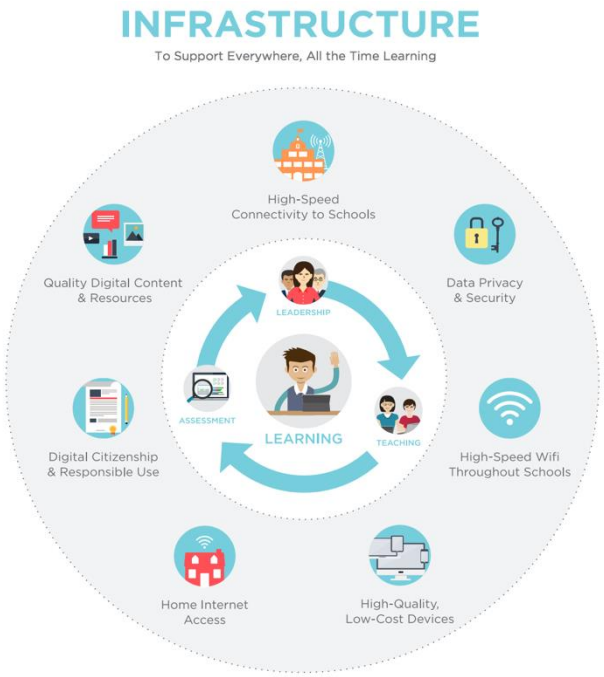
Tablet effects on literacies and digital citizenships – teachers' evaluation (survey question =425)

Activity II 2023+ ?
Kópavogur Schools

Technology and choice of devices

Infrastructure of a modern school development

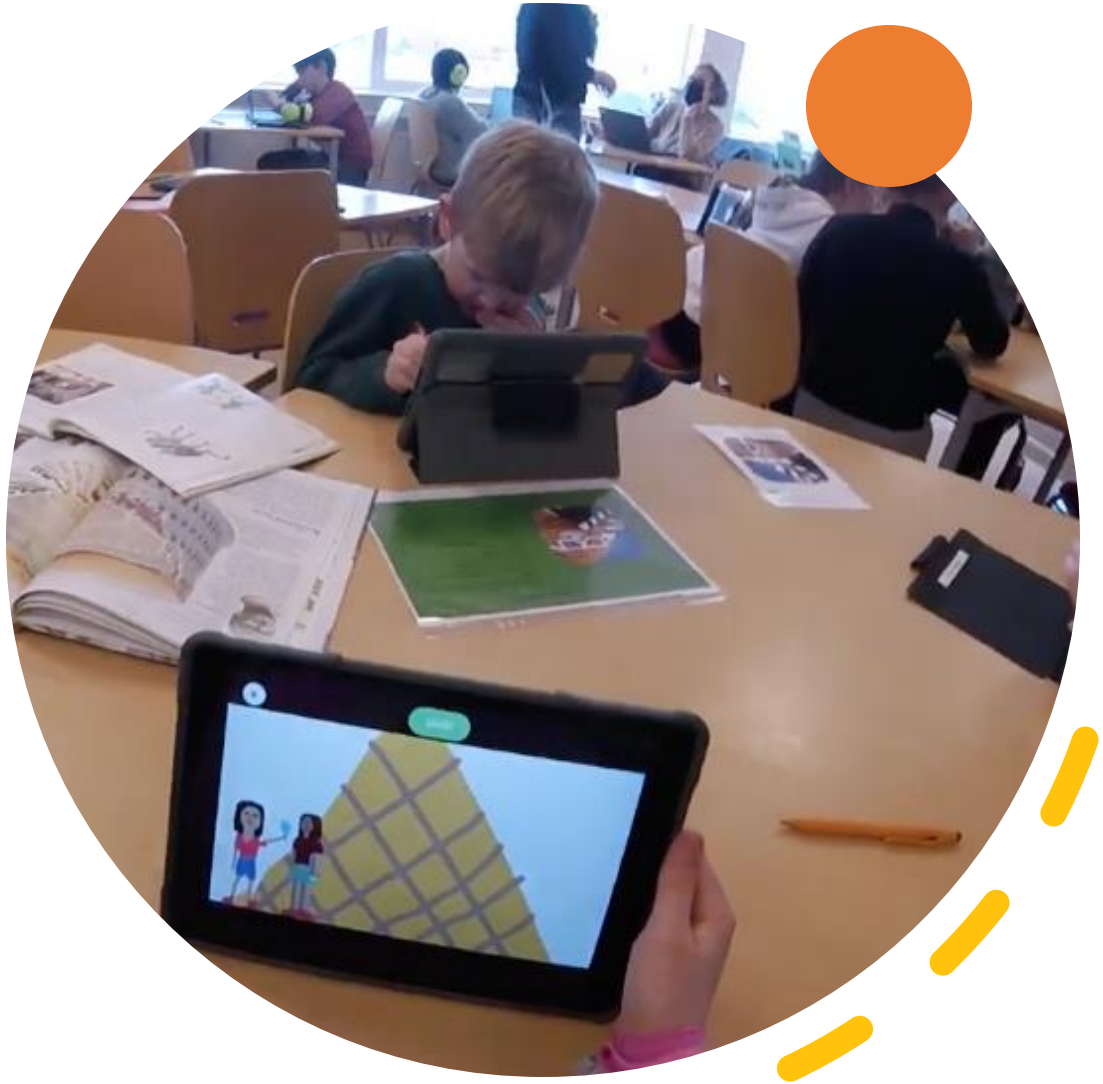
- Good internet connection for a purposeful use
- Access for all, from all locations
- Speedy, wireless internet connections in all classrooms
- Powerful learning devices
- Quality, digital learning materials
- Digital citizenship and policy of responsible use of technologies
- Data safety and personal protection (GDPR)
- Internet access at home



- Review the options for choice of device (1:1 device).
- Restore tha Gadget Bank and renew equipent for loan, examples: digital measureing devices for outdoor learning, VR-AR-XR goggles, to introduce and provide better support for technical developmens in schools.
- Explore options for collaboration with councils in the greater Reykjavík in this respect, andf or chosing and evaluating technologies.
- Consider increased access for lower age levels / primary school students to tablets or at least access to tablets in classes at school.

Teaching, teaching methods & learning

- Create more variety of digital learning materials and develop teching methods using digital technologies.
- Invite creative project work, with relevance to students' interests
- Increase the collaboration of students and group work
- Encourage the integration of traditional school subjects, thematic projects and work on realistic topics with relevance to studens' daily life
- Increase support for SEN childrens' learning and offer more opportunities of professional development to their teachers with digital tecnologies
- Target ICT opportunities and technologies, for improving teaching of students with Icelandic as a second language
- Increase the visibility of school projects and innovative work of students in the community
- Increase or streangthen student participation in evaluation of school activities within each of the nine schools
- Manifest the use of formative evaluation (assessment for learning, inclusive assessment) and enable its implementation
- Regularily follow up on the developments of individual schools / teachers of formative evaluation and harness these in school development
- Move support and teacher advice into the school themselves



Vision, school policies, collaboration

- A steady revision of learning objectives and competences is necessary in the light of rapid renewal of technologies and for school development in the schools of Kópavogur
- Support of school development projects and local educational research (f.ex. teachers' activity research)
- Close observation of educational research, experiences and policy developments in Iceland and abroad
- Emphasise increased collaboration and consultation:
  - Between schools, other local councils, government, organisations and work groups, educational institutions and experts
  - Between teachers, for instance with school visits, to create and share learning materials and project briefs, f. inst. With "educational harvest festivals" and "Edu camps"
  - With students and young persons' councils
  - With parents and parents' organisations

School vision and the core curriculum

- Learning is organised based on the core curriculum competences, that are registered in Mentor (LMS)
- Teaching advisors, effective teacher teams and collaboration contribute to school development
- Regular reviews of school curricula based on teacher consultation is the premise for the renovation of school vision

Reports & Writing

- **Evaluation Report, march 2023**
- Article on the SELFIE-tool í Netla online educational journal in november 2022, where the results from the Kopavogur research were partly represented: https://netla.hi.is/serrit/2022/heidurs_jon_torfa/04.pdf
- **Survey reports:**
  - Student's attitude – report (ca. 63 pages)
  - Parent's attitude – report (ca. 62 pages)
  - Teacher's attitude – skýrsla (ca. 108 pages)
  - Report on results of SELFIE surveys, delivered to Kopavogur Educational Council and school managers in febrary 2022 (ca. 15 pages) – based on the SELFIE school reports from all 9 schools, delivered by the SELFIE tool
- **All reports are accessible on the website of** The Centre for Educational Research on ICT and Media at the University of Iceland: **https://rannum.hi.is**

Other references

- Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. Journal of Education and Work, 14(1), 133-156. 10.1080/13639080020028747
- https://www.tandfonline.com/doi/pdf/10.1080/13639080020028747