ICILS Teacher Panel
Digital learning in times of school closures

General Assembly, 26 Oct 2021

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Background

• Students all around the world were affected by school closures caused by COVID-19.
• Expectations were high that information and communication technology (ICT) could enable learning at a distance.
• At the same time, there were concerns that opportunities offered by ICT are not being well exploited and that social inequalities are increasing.
Key Questions

1. Have ICT-related resources, attitudes, and the use of communication and information technology changed after the outbreak of COVID-19?

2. Did inequality in educational opportunity increase during the COVID-19 pandemic?

3. How stable is school computer equipment, attitudes toward technology, and computer use over time within and across countries?
Design

Understanding how the role of ICT in schools has changed requires longitudinal data, ideally panel data.

• The key challenge is that COVID-19 was not predictable and consequently no study was initiated before the COVID-19 breakout.

• Our approach was to construct panel data using ICILS 2018 as a baseline.

same groups, same measures compared over time

ICILS 2018 school & teacher samples

2018

ICILS 2018 school & teacher samples

2020
Utilizing the Existing Research Infrastructure

A lean and inexpensive study based on an existing study.

• Trialed **instruments** were ready to use.
• Random **samples** with sampling and replication weight were available.
• **Procedures** for data collection and processing were well established.

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**same groups, same measures**

compared over time

ICILS 2018 school & teacher samples

2018

ICILS 2018 school & teacher samples

2020
Timeline

2020: July  Invitation of NRCs (12 countries)
2020: Aug  Confirmation by Denmark, Finland, Uruguay
2020: Oct  Adopt of instruments (e.g., year), translations of few additional items, set up online survey system (OSS)
2020: Nov  Start survey
2021: Jan  End survey in Finland and Uruguay
2021: Mar  End survey in Denmark (school lockdown)
2021: Oct  Release of international report
2022: Nov  Release of public use file
Country context: Infection Rates and School Closures across Countries

- **Denmark**

![Graph showing infection rates and school closures across countries.](image_url)

- 
  - **School closed**
  - **School partially closed**
  - **Holiday**
Country context: Infection Rates and School Closures across Countries

- **Denmark**
  - Bar chart showing reported cases per 100,000 population from January 2021 to March 2021.
  - School closed, School partially closed, and Holiday periods are indicated.

- **Finland**
  - Bar chart showing reported cases per 100,000 population from January 2020 to March 2021.
  - Similar indication of School closed, School partially closed, and Holiday periods.
Country context: Infection Rates and School Closures across Countries

- **Denmark**
- **Finland**
- **Uruguay**

Legend:
- School closed
- School partially closed
- Holiday

Hispano-American Institute
Sample and Panel Attrition

<table>
<thead>
<tr>
<th>Role</th>
<th>Country</th>
<th>2018</th>
<th>2020</th>
</tr>
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<tbody>
<tr>
<td>Teachers</td>
<td>Denmark</td>
<td>1118</td>
<td>441 (39%)</td>
</tr>
<tr>
<td></td>
<td>Finland</td>
<td>1853</td>
<td>1246 (67%)</td>
</tr>
<tr>
<td></td>
<td>Uruguay</td>
<td>1320</td>
<td>469 (36%)</td>
</tr>
<tr>
<td>Principals&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Denmark</td>
<td>140</td>
<td>80 (57%)</td>
</tr>
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<td>Finland</td>
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</tr>
<tr>
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<td>128</td>
<td>66 (52%)</td>
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<sup>a</sup> School leaders and ICT-coordinators may be different individuals in 2018 and 2020.
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\(^a\) School leaders and ICT-coordinators may be different individuals in 2018 and 2020.

- **Non-response bias analyses** revealed mostly small and non-significant differences between participating and non-participating respondents.
- To account for this small bias panel weight were adjusted.
Main Findings

• Have ICT-related resources, attitudes, and the use of communication and information technology changed after the outbreak of COVID-19?  ➔ YES

• Did inequality in educational opportunity increase during the COVID-19 pandemic?  ➔ NO

• How stable is school computer equipment, attitudes toward technology, and computer use over time?  ➔ MIXED
Finding 1 – Change

The ICILS Teacher Panel provided strong evidence that teachers in Denmark, Finland, and Uruguay purposefully used ICT to continue learning during the pandemic.

• Teachers in all countries used ICT for learning and teaching significantly more frequently.
  – Learning management systems and collaborative software
  – ICT-resources at school
  – Teachers collaboration with respect to ICT
  – Emphasis on students’ capability to use ICT

• There is little change in teachers’ general attitudes about the advantages and disadvantages of ICT for learning and teaching and the learning goals.
Finding 1 – Change

**ICT-resources at school**

- Statistical non-significance at the .05 alpha level
- Statistical significance at the .05 alpha level

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<th>Finland</th>
<th>Uruguay</th>
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<tr>
<td>ICT is considered a priority for use in teaching</td>
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</tr>
<tr>
<td>My school has sufficient ICT equipment (e.g. computers)</td>
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<tr>
<td>The computer equipment in our school is up-to-date</td>
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<tr>
<td>My school has access to sufficient digital learning resources</td>
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<tr>
<td>My school has good connectivity (e.g., fast speed) to the Internet</td>
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</table>
Finding 1 – Change

Perceptions about negative outcomes of ICT use

- Impedes concept formation by students
- Results in students copying material from Internet sources
- Distracts students from learning
- Results in poorer written expression among students
- Results in poorer calculation and estimation skills among students

[Charts showing data for Denmark, Finland, and Uruguay from 2018 to 2020, indicating statistical significance and non-significance at the .05 alpha level.]
Finding 2 – Inequality

It was widely suspected that the COVID-19 pandemic exacerbated existing social inequalities in the education system.

- To investigate inequalities in educational opportunity, we compared ICT resources and teachers’ use of ICT in schools with socioeconomically advantaged and disadvantaged student bodies.
- The classification of schools was based on information on students’ socioeconomic status from 2018.
- In terms of school ICT resources and their use, we found rather small opportunity gaps before the pandemic and the existing gaps remained stable during the pandemic.
Finding 2 – Inequality

Teachers’ emphasis on developing ICT-related skills in class by SES groups and study cycle

- Teachers from low SES schools
- Teachers from high SES schools

<table>
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<tr>
<th>Skill</th>
<th>Denmark 2020</th>
<th>Denmark 2018</th>
<th>Finland 2020</th>
<th>Finland 2018</th>
<th>Uruguay 2020</th>
<th>Uruguay 2018</th>
</tr>
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<tr>
<td>To access information efficiently</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To display information for a given audience/purpose</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To evaluate the credibility of digital information</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>To share digital information with others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To use computer software to construct digital work products</td>
<td></td>
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</tbody>
</table>
The ICILS Teacher Panel showed a high degree of stability in the use of ICT at the teacher level, whereas differences between countries have diminished.

- **Experience matters** – teachers who used ICT more frequently before the pandemic continued to do so during the pandemic. This was an almost universal pattern that we observed across most topics and uses within all three countries.

- From a comparative perspective, we observed that ICT was used most frequently in Denmark, followed by Finland and Uruguay. Although the international differences observed in 2018 did not completely vanish in most areas, we observed a reduction in international differences.
Finding 3 – Stability within & across countries
A cross-sectional perspective on ICT use for teaching...

- Presentation of information through direct class instruction
- Support of student-led whole-class discussions and presentations
- Provision of feedback to students on their work
- Support of collaboration among students
- Mediation of communication between students and experts

Graphs showing statistical significance at the .05 alpha level for Denmark, Finland, and Uruguay for different activities over 2018 and 2020.
Finding 3 – Stability within & across countries

The longitudinal perspective shows Uruguay's remarkable catching-up.
Summary and outlook

• The ICILS Teacher Panel is the first **comparative longitudinal study** on the use of ICT and the first panel study the IEA has conducted in 40 years. Descriptions of change based on panel data **extend conventional cross-sectional comparisons**.

• Key findings:
  – The **ICT use increased** massively during the pandemic.
  – **Social inequality** in educational opportunity did **not increase** (with respect to ICT resources and their use).
  – At the teacher level **experience matters**, previous ICT was a strong predictor of the use during the pandemic.
  – At the national level, we observed that cross-sectional **international differences decreased**.

• From a research perspective, the COVID-19 pandemic is an external shock to education systems. The ICILS Teacher Panel **captures longitudinal variation** induced by this shock. The panel data provides a basis for further secondary analysis on the determinants of ICT use.
Thank you!

Questions?
Feedback?