N. Sonck, Sonia Livingstone, E. Kuiper and J. de Haan
Digital literacy and safety skills

Report

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Digital Literacy and Safety Skills
Sonck, N., Livingstone, S., Kuiper, E., and de Haan, J.

Summary
Children’s digital skills were assessed by asking 25,000 European 9-16 year old internet users about their online activities, skills and self-efficacy.

The range of digital skills and online activities are linked. But many younger (11-13 year old) children lack key critical and safety skills. Also, skills are unequally distributed by socio-economic status.

Developing safety skills may encourage other skills, and more skills are associated with more activities online. So, teaching children to be safer need not curtail and may even encourage online opportunities.

Digital skills matter
‘Digital literacy’ or ‘e-skills’ is crucial to children’s use of the internet, as promoted by Europe’s Digital Agenda.¹ Many assume that the more digitally literate children become, the more they can gain from the internet while avoiding or coping with online risks. EU Kids Online asked three questions of internet users in 25 countries:

- **Range of online activities:** children (aged 9-16) were asked if they had done any of 17 activities in the past month; presumably, the more (less) children do online, the greater (weaker) their skills.

- **Specific internet skills:** children (aged 11-16) were asked if they have any of 8 skills – both digital safety and critical/informational skills.

- **Self-efficacy:** children (aged 9-16) were asked, ‘how true is it for you [that] I know a lot about the internet?’

Children’s online activities
Online activities were classified in terms of content, contact and conduct² - see Table 1, although arguably the categories are partially overlapping.

Table 1: Children’s activities online in the past month

<table>
<thead>
<tr>
<th>% who have…</th>
<th>9-12 year old</th>
<th>13-16 year old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
</tbody>
</table>

**Content-based activities**
- Used the internet for school work: 79 82 87 90 85
- Played internet games on your own or against the computer: 86 84 88 71 83
- Watched video clips: 66 64 87 85 76
- Read/watched the news on the internet: 38 36 60 57 48
- Downloaded music or films: 27 26 61 56 44

**Contact/communication-based activities**
- Used instant messaging: 43 47 76 77 62
- Visited a social networking profile: 39 42 80 81 62
- Sent/received email: 42 47 74 76 61
- Played games with other people online: 47 33 63 33 44
- Used a webcam: 23 25 37 38 31
- Visited a chatroom: 14 14 35 28 23

**Conduct/peer-participation activities**
- Put or posted photos, videos or music to share with others: 22 24 54 55 39
- Put or posted a message on a website: 18 18 44 40 31
- Created a character, pet or avatar: 20 17 21 13 18
- Used file sharing sites: 11 8 30 22 18
- Spent time in a virtual world: 15 14 21 12 16
- Written a blog or online diary: 4 6 15 18 11

**Average number of activities**
- 5.7 5.5 9.1 8.2 7.2

¹http://ec.europa.eu/information_society/digital-agenda/index_en.htm

QC102: How often have you played internet games in the past 12 months? QC306a-d, QC308a-f and QC311a-f: Which of the following things have you done in the past month on the internet? Base: All children aged 9-16 who use the internet.
- Children undertake nearly half of the activities (averaging 7.2 of the 17 activities in Table 1), suggesting they enjoy diverse online experiences.

- Participatory culture is less widespread. Content (information and entertainment) and contact (or communication) activities are generally more popular than conduct (participatory) activities.

- There are gender and age differences in skill. Boys (7.5) undertake a slightly wider range of activities than girls (7.0). Whereas the 9-10-year olds undertake 4.7 activities on average, 11-12 year olds do 6.5, 13-14 year olds 8.1 and 15-16 year olds 9.1. As children grow older they learn to do more things on the internet.

- Differences by socio-economic status (SES). Children from high SES households have a wider online repertoire (7.6 activities), compared to those from middle (7.3) and low status groups (6.7).

Skills are unequal. Assuming it takes skill to undertake diverse online activities and that activities encourage the development of further skills, we conclude that younger children, girls and those from lower SES homes are gaining fewer skills (because they do less online, for various possible reasons).

**Children’s online skills**

Conceptually, digital skills may be classified as instrumental (or basic or functional), informational (understanding, navigation, evaluation) and social (communication, self-disclosure, privacy). The eight skills included in the EU Kids Online survey focused on instrumental (mainly safety-related) and informational skills, and were asked of 11-16 year olds.

- Children have on average about half the skills asked about. Children are less able to block or filter content than they are to block people, find safety information or bookmark a website.

- Younger children lack significant skills. Boys (4.3) are slightly more skilled than girls (4.0). Age makes a difference: 11-12 year olds can do 2.8 skills, 13-14 year olds 4.3 and 15-16 year olds 5.2.

- Children from high SES background are more skilled than those from low SES background. Children from high SES homes say they know how to do 4.7 of the skills in Table 2, compared to those from middle (4.2) and low status homes (3.7).

These various skills go hand in hand. The eight skills are all correlated with each other, forming a single scale. Thus, it seems that those who are able to judge the veracity of websites are also those who can find safety information, those who can bookmark a site can also block unwanted messages. On the other hand, those who struggle with one skill are likely to struggle with another.

This has interesting policy implications. The teaching of safety skills may also improve other skills, while teaching instrumental or informational skills may also improve children’s safety skills.

**Table 2: Children’s digital literacy and safety skills**

<table>
<thead>
<tr>
<th>% who say they can…</th>
<th>Boys</th>
<th>Girls</th>
<th>Boys</th>
<th>Girls</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instrumental/safety skills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bookmark a website</td>
<td>56</td>
<td>52</td>
<td>73</td>
<td>72</td>
<td>64</td>
</tr>
<tr>
<td>Block messages from someone you don’t want to hear from</td>
<td>51</td>
<td>53</td>
<td>75</td>
<td>74</td>
<td>64</td>
</tr>
<tr>
<td>Change privacy settings on a social networking profile</td>
<td>41</td>
<td>44</td>
<td>69</td>
<td>69</td>
<td>56</td>
</tr>
<tr>
<td>Delete the record of which sites you have visited</td>
<td>42</td>
<td>37</td>
<td>67</td>
<td>61</td>
<td>52</td>
</tr>
<tr>
<td>Block unwanted adverts or junk mail/spam</td>
<td>41</td>
<td>39</td>
<td>65</td>
<td>57</td>
<td>51</td>
</tr>
<tr>
<td>Change filter preferences</td>
<td>19</td>
<td>16</td>
<td>46</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td><strong>Informational skills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Find information on how to use the internet safely</td>
<td>54</td>
<td>51</td>
<td>74</td>
<td>70</td>
<td>63</td>
</tr>
<tr>
<td>Compare different websites to decide if information is true</td>
<td>47</td>
<td>44</td>
<td>67</td>
<td>63</td>
<td>56</td>
</tr>
</tbody>
</table>

**Average number of skills**

<table>
<thead>
<tr>
<th>QC320a-d</th>
<th>QC321a-d</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4</td>
<td>3.2</td>
<td>5.2</td>
<td>4.8</td>
<td>4.2</td>
</tr>
</tbody>
</table>

3 Factor analysis resulted in a single scale that explained 49% of the variance and with a Cronbach’s alpha of 0.85.
Children's online self-efficacy

Another way to understand children’s digital skills is to ask them to assess their own capacity. Although a crude indicator, subject to over- and under-estimation, online self-efficacy at least reflects children’s self-confidence online. It is also simple to ask, making it a much-used survey item. Children were asked ‘how true is it for you [that] I know a lot about the internet?’ They were also asked, ‘how true is it for you [that] I know more than my parents?’ (Table 3).

- Children knowing more than their parents has been exaggerated. Only 36% of the European 9-16-year olds say it is very true that they know more than their parents, though 31% say it is a bit true. Also, only 33% say it’s very true they know a lot about the internet, though 50% say it is a bit true.\(^4\)

- Some parents know more: one third, rising to two thirds of 9-10 year olds say it is not true that they know more about the internet than their parents.

- Age matters. Older children are more self-confident than younger ones and boys are somewhat more confident than girls.

Table 3: Children’s self-efficacy on the internet

<table>
<thead>
<tr>
<th>% who say they can…</th>
<th>9-12 year old</th>
<th>13-16 year old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>I know more about the internet than my parents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not true</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>A bit true</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Very true</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>I know lots of things about the internet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not true</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td>A bit true</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Very true</td>
<td>22</td>
<td>17</td>
</tr>
</tbody>
</table>

QC319a-b (11-16yr); QC3a-b (9-10yr): How true is it for you that... I know more about the internet than my parents? I know lots of things about using the internet

Base: All children aged 9-16 who use the internet.

- Which children know more than their parents? Interestingly, in addition to older children saying they know more, so too do children from low SES homes, compared to those from high SES homes. Since there is no SES difference for saying they know lots about the internet, this finding points to children’s awareness of the lower digital skills of their parents for those from low SES homes.

Comparing measures of digital skill

The three approaches taken in this report assess children’s skills implicitly (by asking about their activities), explicitly (by asking about particular skills) and holistically (by asking for self-efficacy overall). How do these measures relate to each other?

Table 4: Correlations between skills, activities and self-efficacy

<table>
<thead>
<tr>
<th></th>
<th>Skills</th>
<th>Activities</th>
<th>Self-efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.43</td>
<td>0.36</td>
<td></td>
</tr>
</tbody>
</table>

NB The self-efficacy item is ‘I know lots of things about the internet’. Base: All children aged 11-16 who use the internet.

- Activities, skills and self-efficacy are all positively associated.\(^5\) In short, the more children do online, the more skills they have and the more they judge that they know a lot about the internet. Or, the more skills and/or self-efficacy children have, the greater the range of online activities they undertake. But the converse is also the case — the less of one of these, the less likely the others.

- The highest association is between activities and skills (r=0.55). Self-efficacy is less strongly related to either activities (r=0.36) or skills (r=0.43).

This suggests that improving children’s specific skill set is more important than improving their overall confidence that they know a lot about the internet if the aim is to encourage a greater breadth of use. Conversely, encouraging children to do more online is a good way of improving their digital skill set.


\(^5\) Correlations were tested using Pearson’s r and are significant at p<0.001.
Comparing countries

In addition to comparing skills and activities at the individual level, these can also be compared across countries. In other words, is it the case that in countries where children do a wide (or narrow) range of online activities their digital skills are greater (or lesser)?

- Figure 1 shows that at the country level, this relationship is present but weaker than at the individual level. Still, in countries where children have more digital skills, they also have a wider repertoire of online activities, and vice versa.

- Children in Finland claim to be the most skillful, although their activity score is about average. The greatest range of activities is reported by children in Lithuania.

- In Turkey, both the skills and the level of activities are low. Ireland stands out as a country with a low number of activities.

- Since the correlation does exist, this suggests that at the country level it is worth encouraging either online activities or skills as the one will stimulate the other.

Conclusions

- **Measurement:** if direct observation of children’s digital skills is impractical, then measuring children’s range of online activities is an acceptable and practical substitute. At an individual level the correlation with claimed digital skills is high, although it is weaker at the country level. The simple measure of self-efficacy is the least satisfactory (although it reflects skills adequately).

- **Policy implications.** As digital skills develop with use, inequalities persist – in terms of SES, age and, to a lesser degree, gender. Specific efforts to overcome skill inequalities are thus recommended.

- **Low skills among 11-13 year olds poses a challenge** for teachers, parents and others. Fewer than half can block unwelcome messages or find safety information or bookmark a site, and only a third can compare websites to decide if information is true or block unwanted junk mail.

- To be sure, by trial and error or peer-to-peer learning, older children do gain digital skills, including safety skills. But as ever younger children go online perhaps we cannot wait for this to occur naturally so **digital skills education is important.**

- **The association between safety skills and critical literacy skills** is interesting since it implies that improving (or teaching) the one may also improve the other. This could be explored further.

- Finally, since more safety skills leads to other skills, and since more skills is associated with more activities online, teaching children to be safer online need not curtail their online opportunities; rather, the opposite occurs.

**Figure 1: Digital skills by online activities and country**

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**EU Kids Online II** is funded by the EC Safer Internet Programme (contract SIP-KEP-321803) from 2009-11 to enhance knowledge of children’s and parents’ experiences and practices regarding risky and safer use of the internet and new online technologies.

To inform the promotion among stakeholders of a safer online environment for children, EU Kids Online conducted a face-to-face, in home survey of 25,000 9-16 year old internet users and their parents in 25 countries, using a stratified random sample and self-completion methods for sensitive questions.

For more findings, reports and technical survey details, see [www.eukidsonline.net](http://www.eukidsonline.net).