The News Evaluator's Self-Assessment Tool: Training Adolescents in Civic Online Reasoning

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Abstract

In this extended abstract, we provide details on the dissemination of a project investigating adolescents civic online reasoning abilities. The project has resulted in a self-assessment tool available for free online (www.newsevaluator.com) to be used in curricular activities. The tool is a training device for educating information consumers in digital media literacy as a means of combatting disinformation. The tool has been developed iteratively and evaluated through five separate experiments. The present abstract outlines this process and provides evidence for the tools efficacy.

As new technology is developed to create and disseminate news and other media, tools and techniques for finding and corroborating information are also advancing. There is therefore a constant need to update ones digital literacy skills and use digital tools in updated ways (Lewandowsky, Ecker, and Cook 2017; Wineburg and McGrew 2019). Ku et al. (2019) found that news literate individuals are less likely to share news items on social media, leaving less literate individuals vulnerable as they are more likely to share and be exposed to untrustworthy news. Our own research has highlighted the existence of a digital literacy divide between pupils of different socio-economic backgrounds (Nygren and Guath 2021). In order to overcome divides in different contexts, pupils need more education designed to teach digital source criticism strategies. *The News Evaluator* (www.nyhetsvarderaren.se; Nygren and Brounéus 2018; Nygren 2019) is a research project for investigating student's media habits. As a part of this project we have developed an online self assessment tool for students with tutorials on professional fact-checking strategies. These tutorials serve a novel approach in demonstrating strategies of what has been dubbed *civic online reasoning*, such as lateral reading and click restraint. Instead of explaining civic online reasoning as a theory, the tutorials focus on hands-on demonstrations of click restraint and corroboration through lateral reading of news items, videos, and images designed to go viral on social media. Students are given the task of investigating the validity of the items, after which, the tutorials serve as implicit facilitative feedback on task process. In conjunction with the tutorials, the students are also given explicit feedback on task performance. This is done by displaying their evaluations, together with a written statement on the item regarding how a professional fact-checker might reason about the item, giving ample opportunities for students to revise their strategies and then practice on a new set of items.

Civic Online Reasoning

Research indicates that it is possible to support people's abilities to evaluate online information by giving short instructions on how to identify misleading headlines on Facebook and WhatsApp (Guess et al. 2020), by the use of games designed to alert against manipulative tweets (Roozenbeek and van der Linden 2019) and by educational interventions that support pupils' civic online reasoning (McGrew 2020; McGrew and Byrne 2020). However, because the technological advances in visual media manipulation are leveraging the spread of false or misleading information, researchers are calling for "more intensive digital literacy training models (such as the 'lateral reading' approach used by professional fact checkers)" (Guess et al. 2020, p. 7). To combat misinformation, Lewandowsky, Ecker, and Cook (2017) have called for an initiative to find technological improvements in the dissemination of news as well as training of readers' critical thinking. Among other things, the authors proposed to draw on journalistic skills to improve media education. Such an effort was initiated by Wineburg and McGrew (2019) which led McGrew and collaborators to develop the concept of *civic online reasoning* in order to boil down online source criticism to a few relevant and concrete strategies (McGrew et al. 2017, 2018, 2019; McGrew 2020; Wineburg and McGrew 2019). Civic online reasoning is an elaboration of three heuristics used by professional historians to evaluate historical texts and images (Wineburg 1991, 1998): (a) corroboration (i.e. comparing documents), (b) sourcing (i.e. evaluating the document source before reading its text), and (c) contextualisation (i.e. identifying the document frame of reference).

In their study, Wineburg and McGrew invited professional fact checkers, historians, and university students to evaluate websites with information of importance to citizens. The major finding was that the professional fact checkers outperformed the other groups in their strategies to detect and debunk misinformation. The group of fact checkers employed *lateral reading*, which means that they immediately began

investigating the publisher of the information by opening additional internet browser tabs before they even read the information on the target website. Furthermore, fact checkers also employed *click restraint*; they carefully chose to proceed to links in search results that were relevant and not necessarily ranked as the top result. Thus, the fact checkers, in opposition to the other groups, read multiple, relevant sources in order to be able to corroborate and contextualise the information and understand the publisher's motivation.

Despite somewhat successful efforts to teach information consumers civic online reasoning, there are still shortcomings in improving their performance when it comes to corroboration. Lateral reading is a central aspect of civic online reasoning, which highlights the importance of verifying information by corroborating information and using digital resources in updated ways (Wineburg and McGrew 2019). Much time and effort are required from researchers, teachers, and students, unfortunately with only small pay-offs in terms of actual evaluation of sources. This lack of application of source evaluation is a well-known issue (Wiley et al. 2009; Ku et al. 2019).

Often, online information is not only composed of written text but also accompanied by images and videos, particularly when shared through social media. Information consumers, currently and in the future, must therefore be able to critically assess multimodal sources, which requires not only verbal literacy but also visual literacy. What becomes ever more crucial today is the ability to evaluate the credence of visual and verbal content created by skilled communicators. What has been noted in digital literacy research is that pupils often struggle to separate credible from misleading digital multimodal information (Breakstone et al. 2019). Even pupils with proficient news media knowledge may struggle to evaluate the use of evidence online (Ku et al. 2019). The high expectations of news literacy programmes (Wardle and Derakhshan 2017) should be understood in light of these challenges. Scholars also emphasise that technology and educational interventions are not quick fixes for the complex challenge of misinformation (Roozenbeek, van der Linden, and Nygren 2020). More time in front of computers does not necessarily make pupils more skilled at navigating online information (Kahne, Hodgin, and Eidman-Aadahl 2016; McGrew et al. 2018; OECD 2015). Without adequate digital civic literacy, pupils may fail to separate credible information from misleading information because they are not able to use effective and adaptive strategies when evaluating manipulated images and junk news (Nygren et al. 2020). In education, it is critical that the educational design includes a combination of challenging and stimulating tasks, and different types of hard and soft scaffolds to help pupils use online resources in constructive ways (Kirschner and De Bruyckere 2017; Kirschner, Sweller, and Clark 2006; Mason, Junyent, and Tornatora 2014; Pérez et al. 2018; Saye and Brush 2002; Walraven, Brand-Gruwel, and Boshuizen 2009).

While noting the many challenges, we still find a few studies highlighting the ways in which it is possible to support pupils lateral reading skills in education. Educational designs to promote civic online reasoning have made it possible for teenagers at university and high school level to scrutinise digital news in a similar manner to professional fact-checkers (McGrew 2020; McGrew and Byrne 2020; McGrew et al. 2019). Previous research has also identified that it is possible for upper secondary school pupils to constructively use digital tools designed for professional historians, particularly when aided by supporting materials and teaching (Nygren, Sandberg, and Vikström 2014; Nygren and Vikström 2013).

The News Evaluator Self-Assessment Tool

The aim with our self-assessment tool was to find less resources-intensive curricular activities that can produce at least the same impact as hour long lessons by allowing students to get closer to the task at hand. Classroom interventions to promote lateral reading indicate that students might learn from observing role models who conduct lateral reading and engage with verifying misinformation (McGrew et al. 2019). We initiated our research with a field experiment in an upper secondary school where we had built our first tool with a tutorial aimed at explaining civic online reasoning principles. This attempt failed because the tutorial did not support the participants enough for them to perform the assessment tasks as the instructions were too general. We instead went with an approach where we constructed several short tutorials displaying how particular news items should be assessed using civic online reasoning practices. This approach has been more fruitful and provides better possibilities for scalable interventions.

The current design (available free of charge at www.newsevaluator.com) contains nine news items shared through social media and intended to go viral. The items are a mixture of news, images and videos. The visitor is first given four of the items one at a time and asked to assess its credibility. The credibility assessment answer is provided by a slider on a track bar (see example item in Figure 1). After these four items, the visitor is given four instructions videos explaining how we assessed the four items using civic online reasoning strategies (see example in Figure 2). The visitor is then given a new set of five news item to practice their newly acquired skills.

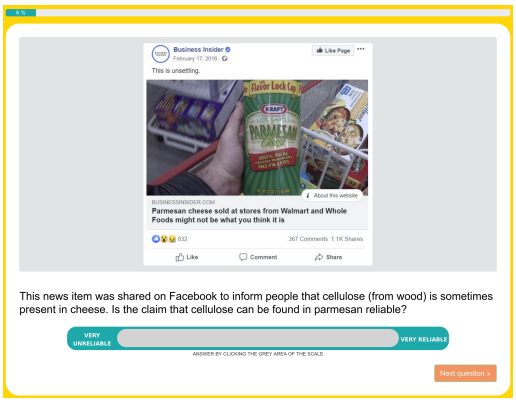

Figure 1: Screenshot of a news item with track bar allowing participants to provide their credibility assessment

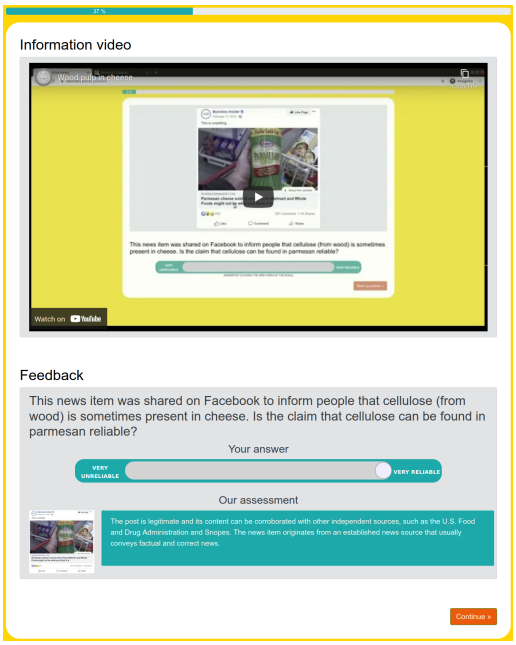

Figure 2: Screenshot of the feedback setup where visitors are presented with a video tutorial and written feedback

Evaluation of the Tool

The current version of the tool has been evaluated in three experiments so far with both university and upper secondary students (Guath, Axelsson, and Nygren in review; Axelsson, Guath, and Nygren 2021). As described, the tool presents the participants with a set of news items to assess in terms of credibility (pre-test henceforth) after which participants are provided with tutorials and feedback (intervention henceforth) and finally, the participants are given a new set of news items to assess (post-test henceforth). In the experiments, we made use of control groups who received no tutorials or feedback, or a combination of tutorials and feedback in order to evaluate the best possible way to promote civic online reasoning. The participants also reported whether they used any digital aids in their assessments such as search engines or reverse image search. To perform lateral reading, use of such aids are necessary.

In the university study (Guath, Axelsson, and Nygren in review), we investigated the interaction between providing performance feedback and the use of tutorials. We also collected data on the participants self-rated abilities. A surprising result in this small scale study was that we found no evidence of enhanced performance with the tutorials. Nor did the combination of feedback and tutorial enhance performance. There was, however, a positive effect of feedback on total score for true, but not fake, items and total score within the group given feedback. Results showed that using digital tools was advantageous for performance on total score, where there was a main effect of using digital tools. However, a post-hoc analysis, showed that there was a marginally significant negative effect of indicating use of digital tools on total score on post-test when given tutorial only without any feedback. However, on an aggregate level, participants performed better on post-test than pre-test on total score. Results showed that feedback enhanced participants' ability to assess online information. Further, indicating that digital tools had been used on the post-test resulted in better performance on total score.

Our previous research (Nygren and Guath 2019) on teenagers media habits has shown associations between performance and self-rated attitudes and abilities, in that confident individuals performed generally worse. In this study however, no correlations were found between post-test scores and self-rated attitudes and skills. The tasks that were measured previously differed from the tasks in the present study. Crucially, the current study measured items that tapped more into visual literacy, whereas the items in Nygren and Guath (2019) relied mostly on text. Another difference between these studies was the target group (teenagers vs. university students). With this experiment, we concluded that an online feedback intervention has the potential to improve people's ability to navigate visual information online, regardless of attitudes and self-rated abilities.

With the upper secondary school students (Axelsson, Guath, and Nygren 2021), we conducted two different experiments, both with one control group and one intervention group. In the first experiment, the control group was not given any tutorial or feedback, only pre- and post-test items. In the second experiment, the control group were given a distraction task as pre-test and video clips from a documentary on artificial intelligence instead of tutorials. The results using this target group provided more telling and promising results.

We found that the intervention group in both experiments performed better on the post-test than the control groups (see Figure 3).

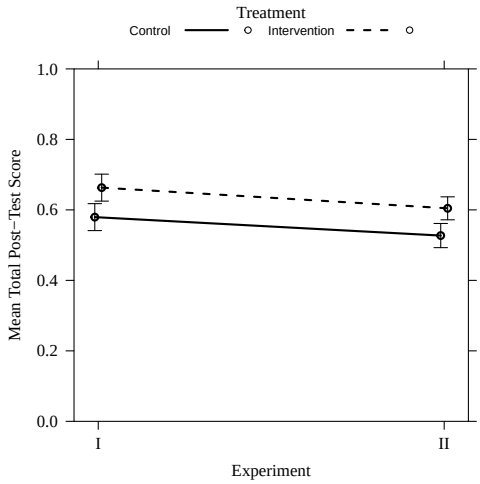

Figure 3: Mean post-test score as a function of experiment and treatment group

The experiments resulted in three major findings: a) intervention groups using our tool exceeded the control groups in credibility assessment performance of the post-intervention

tasks; b) the intervention increased the likelihood of participants making use of digital aids and use of such tools was related to better performance; and c) the intervention made participants better at judging unbelievable but true items, suggesting they became more nuanced in their fact-checking. Additionally, the effect sizes of the reported experiments (0.58 and 0.65) are quite strong compared to other studies using computer-assisted instructions (Education Endowment Foundation 2020).

As a side note, in all experiments, we saw that merely taking the test had a positive effect. That is, performance between pre- and post-tests was improved regardless of participants being in control or intervention groups. This suggests that participants made some progress just by being asked to perform the assessments, highlighting the potential of introducing such interventions in school curricula.

Future Directions

We are currently in the analysis phase of a fifth experiment in the development of our tool and results are forthcoming. In this experiment, we replicated the design used with university students but instead with upper secondary school students. The data has been collected online, but we have also a subset of students using the tools with eye trackers and taking part in interviews to broaden our method. We expect that this study will provide us with more nuanced results regarding the best way to provide instructions and feedback. It should also give us better insight into how student's perform their assessments both pre- and post-intervention. Furthermore, the interviews will give us additional qualitative details on the students assessment habits. Moving forward, we will further develop the concept by initiating research on how to transform this tool into a larger, scalable educational game.

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