NEWS LITERACY AND CRITICAL THINKING EDUCATION THROUGH GAMIFICATION AND GAME-BASED LEARNING

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Contents

Introduction

The post-truth age is marked by an increasing amount of ambiguous information, polarizing views, heuristic thinking, and algorithmic bias (Vraga & Tully, 2021). Therefore the ability and inclination to think critically about news is valued more than ever (Lai Ku, Kong, Song, Deng, Kang & Hu, 2019).

Today, news is produced by more people and distributed across a greater number of platforms and technologies than ever. This new landscape of nearly unfettered participation and accessibility has contributed to an expansion of "news" to include far more than the products of professional journalism outlets. Consequently, there is a growing concern not only about proliferating misinformation but also about people's ability to combat misinformation and to locate and distinguish relevant and high-quality information (Vraga, Tully, Maksl, Craft & Ashley, 2021).

News literacy, today, is seen as a means to improve critical media consumption (Vraga & Tully, 2021). When the potential of news in informing citizens, fostering civic engagement, democratic participation as well as the limitations of news media and changes in news production processes (especially on producers side) are taken into account the importance of news literacy becomes obvious (Ashley, Maksl & Craft, 2013).

News Literacy

News literacy addresses the knowledge and skills necessary to become a more mindful and skeptical news consumer who understands the relationship between journalists, news production, citizens, and democracy in changing media environments. News literacy requires an understanding of both the content and contexts of news production and consumption, including the role of social media platforms and users in the news ecosystem, and the ways in which consumers' beliefs color their selection and interpretation of news (Vraga & Tully, 2021)

News literacy includes an understanding of

- the role news plays in society;
- the motivation to seek out news (having a sense of the importance of following news and understanding the consequences of ignoring the news);
- the ability to find, identify and recognize news (this is important when the shifting boundaries of news definition is taken into account);
- the ability to critically evaluate news; and
- the ability to create news (Malik, Cortesi & Gasser, 2013).

News Literacy is also defined as knowledge of the personal and social processes by which news is produced, distributed, and consumed, and skills that allow users some control over these processes (Vraga, Tully, Maksl, Craft & Ashley, 2021).

News literacy, as a key skill, is important independently from the age and the area of study. News literacy is a crucial transversal skill. It is important not only for a specific group of people (people at a certain age or people belong to a certain professional group) but for everyone, and it is essential in all areas of life (not only at school, but also in the workplace and in daily life).

News Literacy and Critical Thinking

Critical thinking in the post-truth era demands that news users develop and maintain a skeptical way of knowing, and cultivate the ability to discern evidence-based and unbiased information to make sound judgments (Lai Ku, Kong, Song, Deng, Kang & Hu, 2019).

In the post-truth age, facts and objective evidence are less powerful in shaping public opinion than personal beliefs, anecdotes, and popular views (Cooke, 2018). Critical thinking is the first line of defense when information cannot always be trusted, because it guides people to hold beliefs that are consistent with available evidence. A fundamentally important characteristic of critical thinking is an ability to seek evidential foundations in justifying a viewpoint (Lai Ku, Kong, Song, Deng, Kang & Hu, 2019).

Critical thinking plays an essential role in news literacy, which involves knowledge about the news media, and the ability to think about the credentials and quality of the news that results from such knowledge (Rosenbaum, Beentjes, & Konig, 2008). Individuals are not only required to gain knowledge about news industries and news audiences, but they also need to learn how to apply such knowledge in reasoning about news messages. Hobbs (2010) has specified critical thinking skills central to the news literacy.

There is a generally agreed core set of critical skills in the domain of news (Lai Ku, Kong, Song, Deng, Kang & Hu, 2019):
  1. understanding the standpoints and purposes of a news message,
  2. evaluating the strength and quality of evidence,
  3. distinguishing facts from opinions,
  4. identifying biases, and
  5. sharing informed points of views in a digital media environment.

The perils of accepting information based on convenience, emotional appeal, popularity, or other heuristics rather than evidence or facts is amplified by digital news platforms. Social media encourages heuristics processing through consuming news occasionally and sporadically without devoting much time to understanding and evaluating the content. Such heuristic-based consumption is often done by scanning the headlines, keywords, pictures, or other highlights of the news bringing a general impression of news content without in-depth understanding of the news story and complete formation of diverse perspectives (Meijer & Kormelink, 2015).

Heuristic processing of news stories is also encouraged through the social media personalized algorithms. Use of algorithms has changed the nature of news story selection from the professional judgment of editors or journalists to readers' interests and

preferences (Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2017). This brings risks as the algorithms control the flow of news information the public receive, with the public poorly informed about how algorithms select news for them (DeVito, 2017), and many are unaware that such algorithms exist at all (Rader & Gray, 2015).

The social media algorithms contribute to a news environment that makes critical thinking difficult because information is filtered based on user's existing beliefs and preferences: there is a risk of creating "echo chambers" where users only receive content with similar viewpoints from like-minded people. In the absence of counter and diversified viewpoints, one's opinion is constantly rewarded, which further encourages the individual to seek information that are compatible with his or her view. Critical thinking in news is essentially the elimination of heuristics processing as well as reasoning based on prior beliefs or popular beliefs (Lai Ku, Kong, Song, Deng, Kang & Hu, 2019).

News Literacy Education and Game-based Learning

Disinformation is pervasive and could lead to serious consequences. Therefore, individuals need to be competent and intelligent users of information, should be able to critique the "news" being broadcast, and should be able to seek and find the information that is not being broadcast or otherwise prioritized by algorithms. In other words, news literacy skills including critical thinking is one of the key skills for the 21st century.

The importance and need for developing news literacy education programmes, have been clearly addressed in many research papers and strategic documents. Published research studies and reports indicate that the news literacy of citizens at European level is unsatisfactory. The Media Literacy Index, which is produced within the European Policies Initiative (EuPI) of the Open Society Institute (https://osis.bg/wp-content/uploads/2022/10/HowItStarted_MediaLiteracyIndex2022_ENG_.pdf) is assessing the potential vulnerability of European countries to the "fake news" and related phenomena. The Media Literacy Index (2022) indicates that at least half of the countries in Europe (out of 41) are vulnerable to the negative effects of fake news/disinformation. Education is and remains an essential component in addressing the disinformation problems with targeted news literacy education for youth and adults.

The core mission of news literacy education is broadly recognized as "citizen empowerment" in that the critical thinking skills necessary to the evaluation of news reports and the ability to identify fact-based, quality information and encourage active participation and engagement among well-informed citizens. News literacy eduation has been traditionally conducted under the umbrella of media literacy, however especially after the increased global concerns over "post-truth" media consumption and the "fake news" phenomena, news literacy education and the curriculum, on its own, has become part of academic discourse in different disciplines (Kajimoto & Fleming, 2019).

News literacy is sometimes narrowly framed as the transfer of verification skills so consumers can check facts and sources and identify misinformation. While these are valuable outcomes of news literacy education, knowledge and skills that make someone

news literate compose a broader framework (Tully, Maksl, Ashley, Vraga & Craft, 2021, p. 3). For instance, news literacy education helps people identify partisan misinformation and be skeptical of news they encounter, and encourages skepticism toward political conspiracy beliefs. Developing skepticism toward news and information is paramount to distinguishing high-quality content from low-quality or false information (Vraga & Tully, 2021, p. 154)

Undoubtedly, using innovative approaches to teach news literacy skills, which are needed to judge the reliability and credibility of news/information and equip individuals with skills they need to become engaged and informed participants in civic life, increases the success of education programmes. Game-based learning is an active learning technique that uses games to improve learning. Game-based learning has been recognised as a very effective teaching tool due to its immediate appeal and engagement among students. The aim is teaching something while the learner is playing. It can be achieved through non-digital games (including board games) as well as digital games. Game-based learning is flexible, highly adaptable and can be updated very quickly. Playing games enhances the ability to think in a critical way, which boosts the capacity to retain information for a longer time. Moreover, game-based learning supports long-term knowledge retention. Long-term knowledge retention becomes more important when essential skills are thought (Literat, Chang, & Hsu, 2020; Sousa et al., 2024; Wedlake, Coward, & Lee, 2024; Yu, Gao, & Wang, 2021).

Games are easy and fun tools to foster learning. While online games generally attract only a certain age group (mainly young people and children), analog board games specifically have a great appeal for all age groups.

Today a growing number of reputable libraries and educational institutions in Europe teach courses on news literacy, and there are some educational games developed on the subject. This study on the subject revealed that the majority of the games available today are card games (some are also available online) and there are also some escape room type online games. Most of the games are in English although, especially when they are the outcomes of Erasmus projects, there are several multilingual exceptions. They mainly focus on the verification aspect of news literacy skills. Target groups are either youth or adults.

These games bear the characteristics of the so-called serious games where an additional goal of the developer, beyond entertainment, is for the players to acquire skills and knowledge, build attitudes, and change behavior. These types of games are suitable for game-based learning. They develop specific skills, understandings, ways of thinking, attitudes, and as a final result – the ability to handle and interact with information and media content in a deliberate, complete, confident and responsible manner.

In Addition to the games there are several quizzes, most of which help learning news literacy in a fun way. However, there is no game which is designed as a complete assessment tool which covers all aspects of news literacy and gauges the actual knowledge and skill levels of players.

News Literacy Games

#ForYou

Description: A card-based pattern-matching game that helps players understand the role that algorithms play in their online and offline lives, and the value of their personal information to companies that use those algorithms. The game is designed to be delivered either in school or in community spaces such as homework or coding clubs.
URL: https://mediasmarts.ca/digital-media-literacy/educational-games/foryou-game-about-algorithms
Language: English
Development and Funding: MediaSmarts, The Office of the Privacy Commissioner of Canada
Target Group: Youth (13-18)
Notes: Cards, rules and brief video demonstration available on website -- Discussion guide:
https://mediasmarts.ca/sites/default/files/2023-04/guide_foryou_game_algorithms.pdf
https://mediasmarts.ca/sites/default/files/games/foryou_rules.pdf

Bad News Game

Description: It allows players to take on the role of a fake news creator, with the goal of gaining followers while using manipulative tactics such as impersonation, conspiracy theories, and polarization. By simulating how misinformation spreads, the game aims to build resistance to disinformation in real life. Players learn to identify and counteract common techniques used in fake news production, enhancing their media literacy and critical thinking skills**.**
URL: https://www.getbadnews.com/en#intro
Language: Multiple
Development and Funding: Gusmanson
Target Group: Youth (14+)
Notes: Info sheet for educators:
https://www.getbadnews.com/wp-content/uploads/2022/05/Bad-News-Game-info-sheet-for-educators-English-1-1-2.pdf

Brexit Edition: Fake News Card Game

Description: A game to tell the difference between fake news and an actual news story. It is a game for Brexit discussions.
URL: https://shop.sd-studios.co.uk/products/brexit-edition-fake-news-card-game?pr_prod_strat=e5_desc&pr_rec_id=c369d6c2a&pr_rec_pid=8286078337325&pr_ref_pid=8286076272941&pr_seq=uniform
Language: English
Development and Funding: The Takeover Game Company
Target Group: Children, Youth (12+)
Notes: Costs £6.99

Choose Your Own Fake News

Description: An interactive game where players navigate through various scenarios to recognize and combat disinformation. Players assume the roles of different characters, such as Flora, Jo, and Aida, each facing real-life situations involving job scams, election misinformation, or health-related falsehoods. The game teaches critical thinking and media literacy by challenging players to make decisions based on the information presented, helping them learn how to discern truth from falsehood in their everyday lives.
URL: https://chooseyourownfakenews.com/
Language: English
Development and Funding: Pollicy, Mozilla Foundation
Target Group: Youth (15+)
Notes: Characters explore different scenarios that portray how misinformation can have real-life consequences.

Disinformation Challenge

Description: An interactive computer game designed with exercises that encourage users to enhance their critical thinking skills. Using open-source data, players learn to verify information they encounter. This game can serve as supplementary knowledge or be integrated into classroom settings to support curriculums such as Civic Education or History.
URL: https://nepasimauk.lt/en
Language: English, Luthianian
Development and Funding: Civic Resilience Initiative, Three Cubes, Google
Target Group: Youth
Notes: Additional information is provided at https://media-and-learning.eu/subject/media-literacy/the-disinformation-challenge-the-power-of-game-based-learning-in-strengthening-media-literacy/

Fake News Game by Breaking Games

Description: It is a card game designed to encourage critical thinking and challenge players to distinguish between real and fake news. The goal is to create the most absurd and entertaining fake news headline by combining different cards. Players must craft fake news headlines and convince others that theirs is the most plausible or outrageous.
URL: https://breakinggames.com/products/fake-news?_pos=1&_sid=6e12994f1&_ss=r
Language: English
Development and Funding: Breaking Games
Target Group: Adults
Notes: Costs $20. Additional information:
https://breakinggames.com/pages/description-fake-news?srsltid= AfmBOoq7QvGERouYOctCyXpsxVsGtFI5QyK-oRUCRfWJTcfR0klip53

Fakey

Description: This game aims to teach media literacy and study how people interact with misinformation. The goal is to support a healthy social media experience by promoting information from reliable sources and not from low credibility sources.
URL: https://fakey.osome.iu.edu/
Language: English
Development and Funding: OSoMe, Indiana University
Target Group: Adults
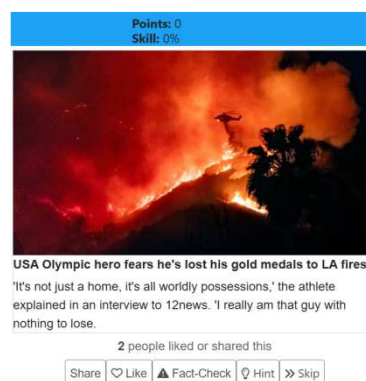
Follow Me

Description: A card game developed to help educators and youth workers to address the topic of critical thinking and media literacy. The game simulates social media. It teaches the importance of thinking before sharing and the importance of fact-checking. When used in an educational setting together with the methodical guidelines, it helps a person to understand how social media work and how they can spot disinformation online.
URL: https://gamifactory.eu/
Language: English, Slovakian
Development and Funding: It is an output of the project Games against hoaxes – game based approach to critical thinking education of youth, co-funded by the European Union within the Erasmus+ programme.
Target Group: Youth
Notes: Costs €24,90. Additional information: https://erasmus-plus.ec.europa.eu/projects/search/ details/2020-2-SK02-KA205-002589

Go Viral!

Description: A 5-minute game that helps protect people against COVID-19 misinformation. Players take on the role of a fake news creator, using emotional manipulation, fear-mongering, and conspiracies to deceive people. The game aims to build resilience to disinformation by showing how such tactics work, helping players recognize them in real life.
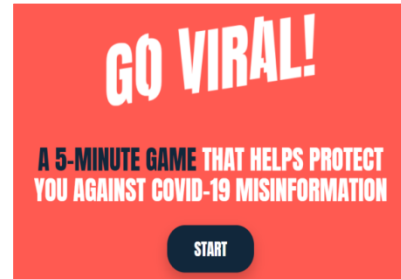**URL:** https://www.goviralgame.com/en
Language: Multiple
Development and Funding: Social Decision-Making Lab at the University of Cambridge, DROG, Tilt, Gusmanson, and the UK Cabinet Office. The game is supported by the World Health Organization.
Target Group: Youth (15+)
Notes: It is part of a public health literacy effort to combat the spread of misinformation.

Harmony Square

Description: The objective of the game is to manipulate public opinion by using techniques like spreading polarizing messages, creating outrage, and exploiting emotional responses. Players learn about the strategies used by disinformation actors to disrupt democratic societies, while gaining insight into how to recognize and counter such tactics in real life. The game promotes critical thinking and media literacy by helping players become more resistant to fake news and manipulation.
**URL:** https://harmonysquare.game/en
Language: Multiple
Development and Funding: U.S. Department of State's Global Engagement Center (GEC), U.S. Department of Homeland Security's Cybersecurity and Infrastructure Security Agency (CISA), Tilt, University of Cambridge, Harmony Square, Gusmanson
Target Group: Youth (15+)
Notes: Additional information: toolkit for teachers: https://harmonysquare.game/wp-content/uploads/2022/10/TOOLKIT-TEACHER-ENGLISH.pdf
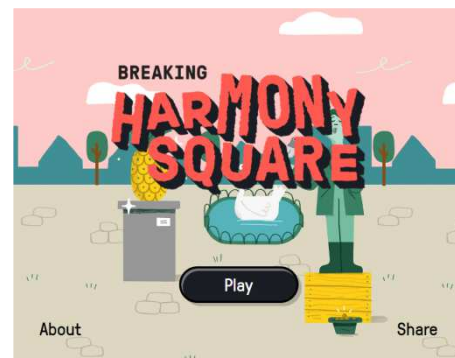
Headlines & High Water

Description: An educational game where players assume the role of a journalist in the fictional town during a catastrophic flood. The goal is to gather information, interview locals, and write news stories that help, inform and protect the town. The game teaches media literacy, journalism skills, and science concepts related to flooding and climate change. Players must navigate through various journalistic tasks, such as fact-checking, while learning the consequences of responsible and irresponsible reporting.
URL: https://fielddaylab.wisc.edu/play/headlines/
Language: English
Development and Funding: UW School of Journalism and Mass Communication. Funding from Baldwin Wisconsin Idea Endowment
Target Group: Children, Youth (11+)
Notes: Instructions: https://static.pbslearningmedia.org/media/media_files/ 5ebf9d12-bc6f-47c8-99ec- 9c36ba2d565a/ecf9562a-cbb3-48d0-bd6f- c715db64ed6c.pdf

Headlines and High Water

Grades 6-9
Journalism, Science

Interland

Description: The Google Interland (Be Internet Awesome game) is a web-based game focused on teaching students how to identify false and misleading information.
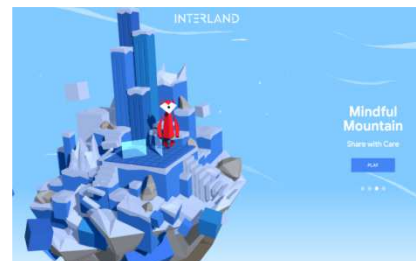**URL:** https://beinternetawesome.withgoogle.com/ en_us
Language: English
Development and Funding: Google
Target Group: Children, Youth
Notes: Additional information: https://beinternetawesome.withgoogle.com/en_us/ interland

LAMBOOZLED

Description: A media literacy card game designed to help players identify misinformation and sharpen their critical thinking skills. The game is set in the fictional town of Green Meadows, populated by sheep, where not all news is what it seems. Players must use their best evidence to determine whether the stories presented in the game are true or fake.
URL: https://lamboozled.com/
Language: English
Development and Funding: Media and Social Change Lab, Teachers College, Columbia University
Target Group: Children, Youth
Notes: Additional information: https://www.masclab.org/lamboozled-card-game https://www.masclab.org/lamboozled-goes-digital

Libertas Veritas

Description: This interactive narrative game is designed to get players thinking about misinformation and propaganda.
URL:
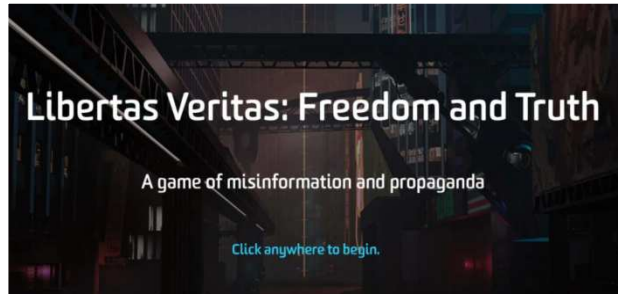https://apps.deakin.edu.au/library/dlm/twine/ MisinformationGame.html
Language: English
Development and Funding: Deakin University
Target Group: Adults
Notes: The game is licensed under CC-BY 4.0 except where otherwise noted.

NewsFeed Defenders

Description: A new media literacy game which teaches players how to detect and disregard disinformation and misinformation in today's chaotic environment.
URL: https://ed.icivics.org/games/newsfeed-defenders
Language: English
Development and Funding: Made with support from the Leonore Annenberg Institute for Civics of the Annenberg Public Policy Center
Target Group: Children, Youth (12+)
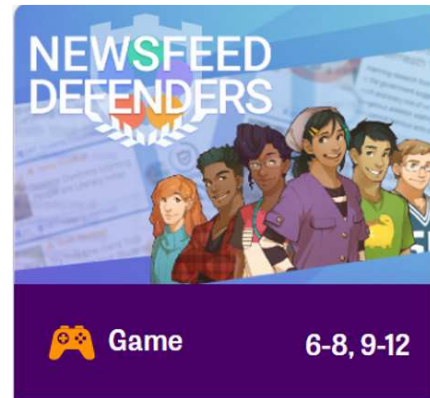
Original Fake News Cards Game

Description: A game to help telling the difference between fake news and an actual news story.
URL: https://shop.sd-studios.co.uk/products/the-original-fake-news-cards-game
Language: English
Development and Funding: The Takeover Game Company
Target Group: Children, Youth (12+)
Notes: Costs £7.99

Cat Park

Description: A web game designed to be played from a smartphone without having to download and install an app. It counters disinformation and fosters media literacy skills. The toolkit contains background materials on the game and the science behind it, as well as a suggested lesson plan tailored for young adults or professionals.
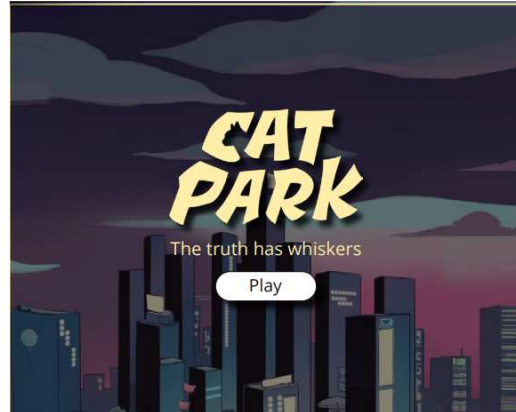**URL:** https://catpark.game/
Language: Multiple
Development and Funding: Developed by Tilt through a grant from the United States Department of State's Global Engagement Center
Target Group: Youth (15+)
Notes: Additional information: https://catpark.game/wp-content/uploads/2023/07/Cat-Park-Media-Literacy-Lesson-Plan.pdf

Cranky Uncle

Description: A game which teaches the rhetorical techniques and logical fallacies which are used to deny science. Climate change, evolution, vaccination, a round Earth. Helps developing resilience against misinformation.
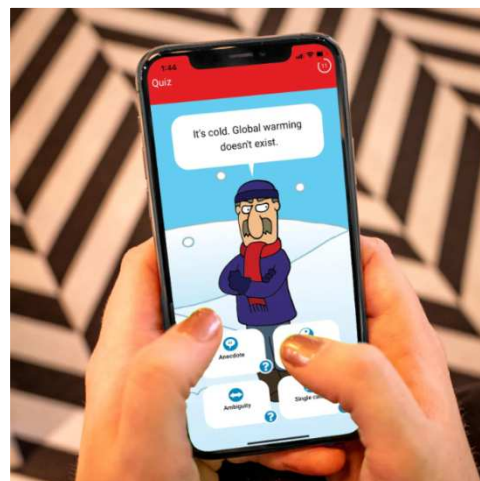**URL:** https://app.crankyuncle.info/
https:// crankyuncle.com/
Language: Multiple
Development and Funding: George Mason University, University of Melbourne, Goodbeast.
Notes: App and webpage game. App is available for free on iPhone and Android.

The Euphorigen Investigation

Description: An escape room where teams of players work cooperatively to solve a series of puzzles. The immersive nature of the medium serves as an engaging way to interact with various deceptive tactics, such as manipulated charts, bot accounts, and deepfakes. It's an experiential rather than skills-based approach for people to think more critically about the information they encounter online. The online version is played over video conferencing software (e.g. Teams, Zoom) and a web browser. The in-person version is a kit that can be downloaded and printed for group play.
URL: https://lokisloop.org/host-access-euphorigen/
Language: English
Development and Funding: University of Washington Center for an Informed Public
Target Group: Adults
Notes: For other languages: https://lokisloop.org/languages/

The Galaxy Escape Room: Mission

Description: An online escape room that immerses players in a world of manipulated media, social media bots, deepfakes and other forms of deception.
URL: https://lokisloop.org/games/
Language: English
Development and Funding: University of Washington Center for an Informed Public
Target Group: Adults

The Bo$$BabyKoin Escape Room

Description: An online escape room that immerses players in a world of manipulated media, social media bots, deepfakes and other forms of deception.
URL: https://lokisloop.org/games/
Language: English
Development and Funding: University of Washington Center for an Informed Public
Target Group: Adults

Troll Factory

Description: The goal of the game is to illustrate how fake news, emotive content and bot armies are utilized to affect moods, opinions and decision-making.
URL: https://trollfactory.yle.fi/
Language: Finnish
Development and Funding: Yle
Target Group: Adults

Fake It to Make It

Description: An online game which shows how easy it is to falsify information with the purpose of financial profit. It is publically available to present or use, inside or outside of a classroom.
URL: https://www.fakeittomakeitgame.com/
Language: English
Development and Funding: Amanda Warner
Target Group: Youth

Know Fake

Description: An analogue card game which aims to empower families and give them a playful opportunity to learn about and analyse the background and workings of fake news. The game is availbale as an app as well as web based.
URL: https://knowfake.eu/en/
Language: Multiple
Development and Funding: Funded by European Comission.
Target Group: Youth
Notes: Produced as an ouput of an Erasmus+ Project.

Conclusions

The increasing importance of news literacy skills increases the importance of news literacy education. The number of educational programs and educational resources developed for news literacy education is gradually increasing. Today innovative teaching approaches such as game-based learning are used in news literacy education along with traditional methods. As a result, a growing number of games, both analog and digital, were developed in the field of news literacy. However, it seems like most of these games focus on verification, the language is English and target group is either youth or adults.

There is still a need for games which includes all aspects of news literacy, in languages other than English, and targeting different age groups such as elderly, and children. There is also a need for developing games for assesment, since there is only several fun quizzes available.

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