

# iEND GAME!

## WP3. EDUCATIONAL ESCAPE ROOM DEVELOPMENT

### Escape Room Design Guidelines



UNIVERSITY OF  
EASTERN FINLAND



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## Title

Escape Room Design Guidelines (*Deliverable 3.1*)

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## Executive Summary

This document presents the Escape Room Design Guidelines (Deliverable 3.1) developed within the framework of Work Package 3 (WP3) of the ENDGAME project. The guidelines aim to ensure that the escape rooms (ERs) being developed within the scope of the project are pedagogically sound, technologically feasible, and culturally relevant across diverse European contexts. They will be the result of a multi-phase design process that integrates evidence from media literacy research, reviews of existing educational games, and, most importantly, insights from participatory design workshops conducted across partner countries (Finland, Serbia, and Spain). The following sections contextualize the project and the purpose of WP3, and provide a comprehensive overview of relevant practices, scenarios, and design frameworks. These include a review of existing media literacy games, outcomes from co-design sessions held across partner countries, detailed design guidelines for narrative and interaction development, and recommendations for implementation, accessibility, and educational integration. Together, they serve as a practical roadmap for building immersive, engaging, and inclusive ERs tailored to promote media literacy among young people across Europe.

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## INTRODUCTION

Promoting media literacy is crucial in helping young people develop the skills to evaluate information sources and prevent them from becoming easy targets of misinformation campaigns. While young people know how to access a wide range of media across a plethora of digital formats, they are unduly trusting of content and do not possess the foundational familiarity with traditional media formats and language that can act as a natural filter required to safely engage with such large quantities and diverse types of media. Additionally, the proliferation of artificial intelligence (AI) exacerbates the issue by automatically generating disinformation content or enabling sophisticated manipulation techniques, such as deepfake technology, which can propagate and amplify disinformation at an unprecedented scale. As AI algorithms personalize content delivery on digital platforms, they create filter bubbles that reinforce youngsters' existing beliefs, further entrenching them in echo chambers of misinformation. To cater to this vulnerable sector of the population —which is also the most avid consumer of social media—, many educators and media literacy professionals have opted for the development of more engaging training opportunities in media literacy, namely through the use of games, which are appealing to young citizens.

The main objective of the ENDGAME project is to empower European young citizens and individuals to be critical thinkers, responsible digital citizens, and active participants in a globalized society. To engage our target audience in the acquisition of media literacy skills, we aim to develop technology-enhanced educational ERs that immerse participants in interactive scenarios that mirror real-life situations in information consumption. The time-sensitive nature of ERs will add an element of urgency, simulating the fast-paced nature of media consumption. Our technology-enhanced educational ERs are aimed to actively engage participants in discerning credible sources, identifying manipulation tactics, and interacting with media content in a critical and informed manner. The focus will be on the technological changes faced by the media, including the growing role of artificial intelligence in the spread of disinformation in social media.

At the heart of the project is the development of three modular educational ERs, each focusing on a specific set of media literacy competencies. These include: identifying disinformation and altered media, detecting AI-generated content, understanding the risks of personal data exposure on social platforms, and recognizing the rights and responsibilities that come with digital media engagement. The ERs will be designed to be both compelling and adaptable, ensuring that players are not only learning but are also intrinsically motivated by the gameplay. Special attention will be given to accessibility, ensuring the games can be played individually or collaboratively, online or in-person, to suit different learning contexts across Europe.

In recognition of the diverse media landscapes and issues across European countries, the project adopts a participatory approach in the selection of topics that will be covered in the educational ERs. To reflect regional priorities in the content of the educational ERs, participatory workshops are organized within WP2 for the selection of these pressing matters in each of the three participating countries —Finland, Serbia, and Spain— representative of diverse regions of Europe with different political and cultural landscapes. The output of these workshops is then used to design the media-related content present in the ERs which will be customized and contextualized (i.e., not merely translated) for each region.

Co-design workshop is also organized within WP3 following a participatory approach to develop the narrative, format, and theme (storyline and gameplay) of the educational ERs in a way that is appealing to our target group, ensuring that a diversity of perspectives is taken into account to maximize youth engagement and that the ER games are intrinsically motivating beyond a learning activity. The emphasis on inclusivity and the participatory approach ensured that the project resonates with individuals from various cultural backgrounds, promoting a

diverse and pluralistic media environment. The developed ERs will be completely modular and customizable, which allows them to be easily adapted to new contexts beyond the scope of the project through the development of content specific to other regions.

This document begins by reviewing the state of media literacy education and the pedagogical potential of educational ERs. It continues with an overview of existing games and ERs for media literacy, followed by a synthesis of participatory workshop results used to inform narrative development and gameplay design.

The central part of the guidelines presents detailed design recommendations, covering narrative development, puzzle creation, inclusivity, accessibility, and technical implementation (Unity and ESCAPP integration). Each element is designed to ensure that the ERs do more than transmit information — they immerse learners in authentic, interactive experiences that simulate the challenges of navigating today's media landscape.

In doing so, the document provides a blueprint for creating engaging, adaptable, and educationally meaningful ERs that can be deployed in both formal and informal learning environments. The result is a scalable, modular, and learner-centered solution for improving media literacy among young people in Europe and beyond.

## REVIEW OF GAMES FOR MEDIA LITERACY

The growing body of research on media literacy education has increasingly explored the role of game-based approaches, with several recent studies offering insights into their effectiveness, limitations, and potential for broader implementation —all of which inform the rationale behind our escape room design strategy. Here, we present the findings of some of the most recent literature reviews on media literacy training, with a focus on game-based or gamified strategies.

Dumitru et al. (2022) explored existing media literacy training programs and concluded that many are disjointed, limited in duration, and focus on narrow audiences. They advocate for more sustainable, research-backed, and inclusive approaches that extend beyond traditional educational settings. Their analysis highlights the potential of gamified strategies, though these must be accompanied by thorough assessments and efforts to ensure wide accessibility.

In a related study, Lu et al. (2023) conducted a meta-analysis of 42 interventions aimed at enhancing individuals' ability to identify misinformation. Their findings show that games were more successful than static content such as images or infographics. Notably, whether the training was delivered online or offline had little impact on effectiveness, supporting the feasibility of scaling such efforts. Additionally, the participants' age and gender did not significantly influence outcomes.

Focusing on games specifically, a recent review of the literature (Glas et al., 2023) revealed that games that have "a more immediate positive and negative feedback loop are suitable for the education of media literacy skills (as opposed to games that have the player make long term strategic decisions which rely more on other rhetorical strategies to educate the player)". In addition, the authors highlight the effectiveness of the games in which players assume a different identity or role that allows them to connect to the media literacy topic under study. Another recent review of media literacy games (Contreras-Espinosa, 2023) found that games that have a duration under one hour are more suitable to integrate into educational settings. Moreover, the authors of the review highlighted several limitations of the analyzed games. For instance, most games follow a behaviorist learning approach, instead of a constructivist one which is often more desirable for learning purposes. In addition, most games were targeted at children around 12 and 14 years old, while older teenagers and young adults were mostly left out.

The findings from existing research pointed us to educational ERs as a type of game that matches the most effective practices identified by the literature reviews while catering to the aspects and target groups left out by the existing games. In ERs, players are engaged in a narrative whereby they assume a character's role that requires them to achieve a certain objective in a limited time. They are based on the social-constructivist learning theory, by which knowledge is constructed based on learners' interaction with one another. Educational ERs are often targeted towards teenagers and young adults rather than small children due to their reliance on critical thinking, logic, and creativity. Existing research on educational ERs has found them to be very engaging learning activities, while capable of improving knowledge and skills in learners across educational levels and fields (López-Pernas, 2023).

## REVIEW OF EXISTING EDUCATIONAL ESCAPE ROOMS FOR MEDIA LITERACY

### Identifying previous ERs for media literacy

We carried out a structured review of previous research to find and analyze studies that used educational ERs or breakout games to teach media literacy. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and focused on articles published in three major academic databases: Scopus, Web of Science, and ERIC. A total of 13 studies met our criteria and were included in the final analysis. The process and results have been disseminated in the form of a scientific article, which is under review at the moment of writing this deliverable. The pre-print has been made available online (López-Pernas et al., 2025). In this document, we summarize some of our main takeaways.

### Media literacy skills

Media literacy, commonly defined as "the ability of a citizen to access, analyze, and produce information for specific outcomes" (Aufderheide & Firestone, 1993), encompasses eight primary competencies according to the Dutch Media Literacy Competency Model (2021). Below is a description of the main learning objectives covered by the reviewed ERs, classified according to the Dutch model..

1. **OPERATE devices & software:** Navigating mobile security settings (Stellmacher et al., 2022), and operating library services (Pun, 2017).
2. **EXPLORE applications:** Exploring social media posts (Pun, 2017).
3. **FIND information:** Evaluating information sources (Gil Ruiz, 2024; Pun, 2017), and finding information about licensing (Buchner, Rüter & Kerres, 2022).
4. **CREATE with media:** Media content creation (Francia, 2021; Gil Ruiz, 2024), and editing Wikipedia entries (Pun, 2017).
5. **CONNECT through media:** Collaborating on counter-narratives (DeJong, 2023), building empathy online (Jadán-Guerrero et al., 2022).
6. **DISCUSS media:** Discussing media reliability/credibility/trust (Buchner, 2025; Cho et al., 2023; Wedlake, Coward & Lee, 2024), as well as content manipulation (DeJong, 2023).
7. **UNDERSTAND media:** Evaluating misinformation (Buchner & Höfler, 2024; Buchner, 2025; Cho et al., 2023; Gil Ruiz, 2024; Paraschivoiu et al., 2021; Wedlake, Coward & Lee, 2024), detecting AI-generated media (Buchner & Höfler, 2024), recognizing deep fakes (Cho et al., 2023; Wedlake, Coward & Lee, 2024), as well as understanding key concepts such as confirmation bias (Cho et al., 2023; Wedlake, Coward & Lee, 2024), echo chambers (DeJong, 2023), cyberbullying (Jadán-Guerrero et al., 2022), data traces (Maragkoudaki &

Kalloniatis, 2022), copyright (Buchner, Rüter & Kerres, 2022), and privacy policies (Stellmacher et al., 2022).

8. **REFLECT on media usage:** Reflecting on information manipulation techniques (Buchner & Höfler, 2024; Buchner, 2025; Paraschivoiu et al., 2021) and on citation and credibility (Pun, 2017), as well as recognizing emotional manipulation (Cho et al., 2023; Wedlake, Coward & Lee, 2024) and digital surveillance (Maragkoudaki & Kalloniatis, 2022).

## Media literacy areas

In addition to the eight competencies, the Dutch model recognizes ten media areas. Below is a **detailed list** of the ten areas, with **specific connections to ER content** and **explicit study references** so as to highlight which exact topics were addressed by which exact ERs.

1. **Health:**
  - Cho et al. (2023): Addressed public health misinformation.
  - Jadán-Guerrero et al. (2022): Tackled the emotional and psychological impact of cyberbullying.
  - Gil Ruiz (2024) and Paraschivoiu et al. (2021): Included scenarios related to climate change and environmental health narratives.
2. **Leisure:**
  - DeJong (2023): Designed as an engaging experience for informal events, allowing for casual participation.
  - Paraschivoiu et al. (2021): Deployed in public science events and informal learning environments to raise media awareness through play.
3. **Self-actualisation:**
  - Frania (2021) and Gil Ruiz (2024): Involved participants in creating their own games or content, promoting creative expression.
  - DeJong (2023) and Wedlake et al. (2024): Included reflective components that encouraged personal growth and self-awareness about media practices.
4. **Identity:**
  - Buchner (2025), Buchner & Höfler (2024), Cho et al. (2023): Helped players recognize how misinformation can exploit identity-related biases.
  - DeJong (2023): Had participants explore how digital identities are shaped in online narratives.
  - Maragkoudaki & Kalloniatis (2022), Stellmacher et al. (2022): Focused on privacy and data protection, challenging participants to manage their digital self.
  - Paraschivoiu et al. (2021), Wedlake et al. (2024): Included tasks that asked players to evaluate their online behavior and susceptibility to manipulation.
5. **Belonging:**
  - Buchner (2025), Buchner & Höfler (2024): Addressed how misinformation can influence social group dynamics and community trust.
  - Jadán-Guerrero et al. (2022): Focused on cyberbullying and social exclusion, simulating peer group dynamics.
  - Paraschivoiu et al. (2021): Encouraged participants to engage in collective reflection during gameplay, fostering a sense of shared mission.
6. **Informal ties:**
  - Jadán-Guerrero et al. (2022): Simulated interactions between peers in school settings to explore the role of informal social circles in cyberbullying scenarios.
7. **Formal ties:**
  - Maragkoudaki & Kalloniatis (2022): Educated players on institutional data protection rules and the GDPR.

- Stellmacher et al. (2022): Highlighted users' responsibilities in navigating privacy settings and legal implications.
- Buchner et al. (2022): Introduced Creative Commons licensing and copyright, linking personal content creation to formal legal structures.

**8. Education:**

- Buchner (2025), Buchner et al. (2022), Buchner & Höfler (2024): Developed specifically for schools or teacher education to build digital and critical literacy.
- Gil Ruiz (2024): Designed for university-level learning about misinformation, copyright, and media production.
- Paraschivoiu et al. (2021): Used in higher education contexts to foster discussion on news credibility and media analysis.

**9. Employment:**

- Buchner (2025), Buchner et al. (2022), Buchner & Höfler (2024): Supported pre-service teacher training and media-related professional development.
- Gil Ruiz (2024), Paraschivoiu et al. (2021): Built workplace-relevant skills like evaluating media content and understanding data usage.

**10. Money:**

- Maragkoudaki & Kalloniatis (2022): Emphasized how personal data is monetized and the economic stakes of digital surveillance.
- Stellmacher et al. (2022): Linked mobile security and privacy settings to risks of data exploitation and commercial misuse.

## ER narratives

The reviewed educational ERs employed immersive storylines and puzzle-based mechanics to engage players in media literacy learning, often presented through investigative or dystopian narratives. For example, *Escape Fake* (Paraschivoiu et al., 2021; Buchner & Höfler, 2024) placed players in a future dominated by fake news, while *The Euphorigen Investigation* (Cho et al., 2023; Wedlake et al., 2024) used a supplement-safety plot to explore misinformation tactics like deepfakes and emotional manipulation. Copyright and licensing were taught through real-world tasks in Buchner, Rüter & Kerres (2022), and privacy risks were illustrated through interactive household scenarios in *Escape Privacy* (Maragkoudaki & Kalloniatis, 2022). ERs like *Puzzle Policy* (Stellmacher et al., 2022) and *Reactile* (DeJong, 2023) challenged players to uncover hidden agendas in institutional or commercial contexts, while Jadán-Guerrero (2022) focused on empathy and bullying. Some games, like those in *Frания* (2021) and Gil Ruiz (2024), were created by students and emphasized creativity and real-world issues like climate misinformation. Across all ERs, classic game mechanics—code breaking, hidden object searches, and lock-and-key puzzles—were integrated with media literacy tasks to create engaging, educational experiences.

## Format and delivery

The analyzed ERs varied in format and delivery, with 60% being fully digital, 30% using hybrid designs that mix physical and virtual elements, and only one ER conducted entirely in a physical format. Among the nine studies reporting delivery modes, 56% ran the ERs face-to-face, 44% conducted them remotely, and two studies mentioned their ERs were suitable for both. Digital ERs were commonly built using platforms like Genially (*Frания*, 2021; Jadán-Guerrero et al., 2022; Gil Ruiz, 2024), Unity (Maragkoudaki & Kalloniatis, 2022), and Articulate Storyline (Buchner, 2022). Fully online games include *The Euphorigen Investigation* (Cho et al., 2023; Wedlake et al., 2024), which was facilitated via Zoom or Teams, and *Puzzle Policy* (Stellmacher et al., 2022), designed as an Android-based game. Hybrid formats were seen in *Escape Fake* (Buchner, 2025; Buchner & Höfler, 2024; Paraschivoiu et al., 2021), where players scanned augmented reality (AR) markers in

a real classroom, and in *Hacking the Research Library* (Pun, 2017), which combined physical teamwork with digital research tasks. The only fully physical ER was *Reactile* (DeJong, 2023), set up in a converted university office. Overall, the ERs demonstrate flexible implementation, allowing adaptation to different teaching contexts and technological settings.

## Duration

The reviewed ERs showed a range of durations, typically from 15 to 60 minutes of gameplay, with variations depending on the format, audience, and how the ER fit into broader learning activities. Digital ERs tended to be the shortest: for instance, Buchner et al. (2022) lasted around 15 minutes, while *Escape Fake* (Buchner, 2025; Buchner & Höfler, 2024) offered about 25 minutes of playtime, extending to 45–90 minutes when including pre- and post-activities. Hybrid and physical formats required more time—often 60 minutes or more—due to the need for technical setup and onboarding (Paraschivoiu et al., 2021; DeJong, 2023). The *Euphorigen Investigation* (Cho et al., 2023; Wedlake et al., 2024) lasted around 75 minutes, including debriefs and optional surveys. The longest durations were found in studies where students designed their own ERs, such as *Frания* (2021) and *Gil Ruiz* (2024), which involved multiple hours across several sessions for planning, gameplay, and reflection. Notably, Stellmacher et al. (2022) found that players spent around 33 minutes engaging with a gamified privacy policy—far more than the 9 minutes spent by control participants reading a text—highlighting how ERs can sustain engagement with otherwise dry content.

## Context and participants

The reviewed studies were implemented in a wide variety of educational and public contexts, including universities, high schools, libraries, exhibitions, and remote learning environments. Most ERs were used in higher education, particularly in teacher training programs, as seen in Buchner & Höfler (2024), *Frания* (2021), and *Gil Ruiz* (2024). In *Gil Ruiz* (2024), for example, 107 third-year university students (aged 19–21) collaboratively created ERs about climate misinformation. Other university-based studies involved diverse adult learners: Buchner et al. (2022) included 41 participants aged 18 to 60, from students to lecturers, engaging in solo digital ER experiences. High school settings were also explored, such as in Buchner (2025) and Jadán-Guerrero et al. (2022), where ERs were tailored for students aged 10–15, with adapted narratives and activities. Informal learning environments featured prominently in Cho et al. (2023), Wedlake et al. (2024), and Pun (2017), where ERs were implemented in public and academic libraries. Notably, the *Euphorigen Investigation* engaged over 200 diverse participants (ages 14–82) across dozens of sessions. Similarly, Paraschivoiu et al. (2021) reached 500 adolescents at a public event in a shopping mall, although only 49 completed post-game surveys.

## Evaluation

The reviewed studies used a variety of evaluation methods to assess the effectiveness of educational ERs, with most focusing on learning outcomes, engagement, and critical thinking. Several studies, such as Stellmacher et al. (2022) and Buchner et al. (2022), conducted controlled experiments comparing ERs to traditional instruction, revealing gains in retention, self-efficacy, and engagement, though sometimes at the cost of higher frustration or unchanged attitudes. Studies on fake news ERs (Buchner, 2025; Buchner & Höfler, 2024) used validated scales to show improved knowledge, critical attitude, and confidence, particularly among younger students. Others, like DeJong (2023) and Pun (2017), adopted more exploratory or design-based approaches, emphasizing the role of narrative, physical interaction, and collaboration in

supporting media literacy. Mixed-methods studies, such as Wedlake et al. (2024) and Cho et al. (2023), analyzed player behavior, post-game reflections, and focus groups to show how ERs foster critical conversations and raise awareness of misinformation tactics like emotional manipulation and deepfakes. User experience and emotional impact were also central in studies like Paraschivoiu et al. (2021) and Maragkoudaki & Kalloniatis (2022), which highlighted engagement and privacy awareness, despite mixed results on perceived learning. Finally, Gil Ruiz (2024) and Frania (2021) explored how designing ERs can support students' media literacy development, noting increases in motivation, collaboration, and critical awareness, though with gaps in practical reasoning and creativity.

## Recommendations

The reviewed studies offered several practical recommendations to enhance the design and implementation of educational ERs. A key theme across the literature was the importance of embedding ERs within broader instructional frameworks. Buchner & Höfler (2024), Buchner (2025), and Paraschivoiu (2021) recommended integrating ERs into long-term curricula and pairing them with complementary instruction to boost learning outcomes. Buchner et al. (2022) specifically advised using ERs after explicit teaching of the core content. Post-game debriefing was also widely encouraged—as noted by Cho et al. (2023) and Wedlake et al. (2024)—to support reflection, peer learning, and critical discussion. Design-wise, DeJong (2023) emphasized the role of physical interaction for enhancing immersion, while Pun (2017) and Wedlake et al. (2024) suggested using relatable content, such as real-world issues or memes, along with clear guidance and alignment with literacy models. To increase engagement, Cho et al. (2023), Wedlake et al. (2024), and Pun (2017) highlighted the value of teamwork, immersive storytelling, and emotionally resonant experiences to help students connect with the material and navigate complex issues like misinformation without defensiveness.

## Identified gaps in the literature

Based on the review of the existing literature, we identified several points that can inform our ER design as well as several limitations.

First, there was limited coverage of media literacy competencies. Most escape rooms covered important competencies such as understanding and reflecting on media usage, but there was an underrepresentation of other important competencies such as *connecting*, *creating*, *operating*, and *exploring* media competencies. We believe there is a missed opportunity to develop participatory and collaborative digital skills.

Similarly, there was a narrow focus on specific media usage areas, whereby other areas related to contemporary digital economies (e.g., cryptocurrency, influencer culture) were underrepresented, and so were some political topics, such as conspiracy theories. More attention to AI-generated content was also missing. Moreover, although most storylines required role-taking, the player was often asked to take a third person role (such as a time-traveller), rather than being embedded in the narrative themselves. On another vein, common youth platforms such as *TikTok*, *WhatsApp*, and *Reddit* were absent even though they are heavily used by young people.

Our analysis also revealed an underutilization of physical and embodied learning. There was a clear preference for digital or hybrid formats. This can be understandable because physical ERs offer benefits for immersion but face practical constraints. Another point we observed is that most ERs had a short duration (typically under one hour). Short durations may help curricular integration but also restrict opportunities for reflection and deep learning.

From the research point of view, there were diverse and inconsistent evaluation methodologies, including validated scales, interviews, and informal reflections. There are a number of instruments for assessing media literacy learning and engagement, but no clear standard. In spite of the dominance of digital resources, few studies employed fine-grained data (e.g., trace logs) to analyze learning behaviors. Lastly, many of the studies conducted ERs as standalone activities, but the evidence points to better outcomes when integrated before/after instruction.

## PARTICIPATORY DESIGN WORKSHOP RESULTS

### Objectives of the workshop and integration of disinformation narratives

The participatory design process in WP3 aimed to ensure that the educational ERs being developed in the scope of the ENDGAME project are engaging, contextually grounded, inclusive, and reflective of regional disinformation challenges. Building on the findings from WP2 (Identification and creation of contextualized media literacy scenarios), the co-design process focused on translating country-specific disinformation narratives into compelling and pedagogically relevant scenarios tailored for game-based learning environments. The goal of the participatory workshop, where participants contributed to shaping both the narrative structure and puzzle mechanics of the ERs, was to co-create learning experiences that go beyond instructional objectives —immersive storylines, visually dynamic environments, and meaningful challenges that resonate with the everyday media experiences of young people. A core principle of this approach was the meaningful inclusion of diverse perspectives, particularly those often underrepresented in digital design and media education. Rather than treating participants as end-users, the process positioned them as co-creators. The workshops were thus grounded in the belief that participatory design is not a peripheral consultation tool, but a creative and empowering methodology through which learners directly influence the form, tone, and function of the educational media they engage with.

The foundation for the co-design process in WP3 was laid in WP2, where each country team (Finland, Serbia, and Spain) conducted participatory workshops to identify prevalent disinformation narratives in their local information ecosystems. These narratives were categorized into key themes such as misleading health or environmental information, visual misinformation and manipulated images, AI-generated content (e.g., deep fakes or fabricated text), personal data misuse on social media, and conspiratorial narratives or emotionally manipulative stories. Recurring themes across different countries (Spain, Finland, and Serbia) are presented in Table 1, while themes that are common for all countries are shown in Table 2. In Spain, they have challenged low media trust and high news avoidance. The biggest challenge in Finland is the paradox of high literacy vs. low self-trust. Lastly, in Serbia, participants face weak media literacy and a polarized media environment. Additionally, within Table 3 we present how insights will potentially inform ER narratives.

Table 1. Recurring Themes Across Regions, per country

Country	Challenge	Description
Spain	Low media trust and high news avoidance	Only 33% trust the news, and 44% of youth actively avoid it. Disinformation exploits this distrust and disengagement.
Finland	Paradox of high literacy vs. low self-trust	Despite high media literacy, many young Finns lack confidence in detecting false information and are vulnerable to global

		disinformation trends due to a strong reliance on English-language media.
Serbia	Weak media literacy and a polarized media environment	Ranked low in media literacy (31st of 41), with a <b>highly polarized media landscape that spreads nationalist and anti-democratic disinformation</b> . Youth are especially exposed via popular platforms like Instagram.

Table 2. Recurring Themes Across Regions, all countries

Country	Challenge	Description
All countries	Dominance of social media as a news source	Platforms like <b>Instagram, TikTok, and YouTube</b> are preferred by youth, but <b>lack of source verification</b> and algorithmic amplification increase exposure to manipulative content.
	Political and ideological polarization	<b>Disinformation aims to erode trust in institutions, democratic processes, and marginalized communities</b> by leveraging political division and emotional manipulation.
	Overlapping of disinformation and hate speech	Especially <b>in immigration and identity-related topics</b> , false claims are used to <b>incite hostility toward minority groups</b> , often reinforcing racism, Islamophobia, and anti-LGBTQIA+ sentiment.

Table 3. How insights will potentially inform ER narratives

Insight from Research	Application in ER Design
Generative AI literacy gaps	Feature <b>AI-generated content puzzles</b> where subtle inconsistencies must be spotted in seemingly authentic text, images, or audio.
Headline-only reading habits	Implement puzzles where <b>misleading headlines</b> contradict article content, rewarding players who read thoroughly.

Participants in WP3's design workshops reviewed these narratives and reflected on which would be most relevant, accessible, and appropriate for gamification within an ER format.

## Participatory Design Webinar Summary

An international participatory design webinar was held with stakeholders from all three partner countries to collaboratively shape the high-level narrative arc, structure, and educational strategy of the ERs. To ensure representational diversity in ER design, each national team invited participants from various age groups, gender identities, socio-economic backgrounds, and digital media familiarity levels. Stakeholders included: secondary and university students, schoolteachers and digital literacy educators, media literacy trainers and youth workers, civic society representatives and media professionals, individuals from underrepresented groups. A total of 58 people registered and we succeeded to have 41 participants in total (Figure 1), ensuring diversity in gender, ethnicity, ability, and region.

The duration of the webinar was 100 minutes (online), we used the Zoom platform, Figure 1 ([https://uef.zoom.us/meeting/register/d-Ok41vZS\\_W\\_fMGyBERFAw#/registration](https://uef.zoom.us/meeting/register/d-Ok41vZS_W_fMGyBERFAw#/registration)). The structure of the webinar consists of a presentation, breakout discussions, quizzes, and usage of collaborative tools. The webinar utilized tools like AhaSlides, AhaSlides Word Cloud Generator and Google Forms to capture ideas, votes, and sketches. Narrative ideas such as Breaking the Fake and Operation: Factcheck emerged directly from this process.

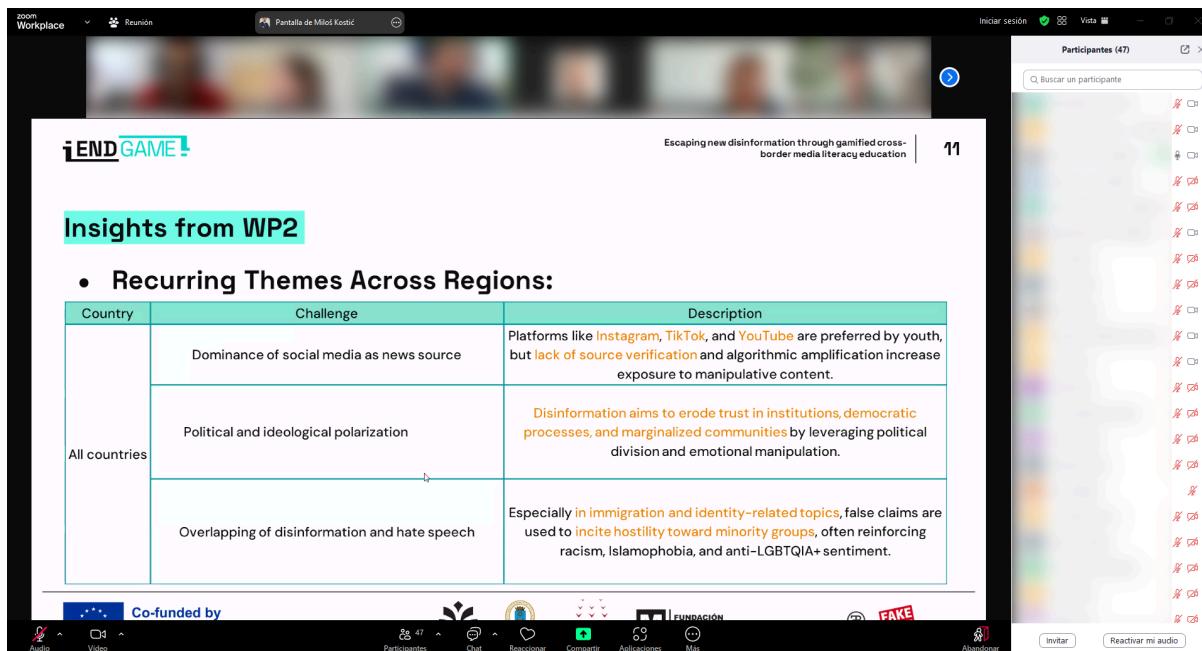


Figure 1. Screenshot of *Zoom* window with visible participant count and part of the participant list (areas are blurred due to privacy policy)

## Workshop Structure

In this section, we present the structure of the held webinar, together with all the examples that were discussed with the participants, and the results we reached. The webinar consisted of the following sessions, which will be explained separately in detail:

1. **Welcome and Introduction** (10 minutes)
2. **Presentation of Insights from WP2** (10 minutes)
3. **Brainstorming Narrative Ideas** (25 minutes)
4. **Puzzle and Skill Mapping** (20 minutes)
5. **Inclusion and Accessibility Discussion** (10 minutes)
6. **Wrap-Up and Next Steps** (20 minutes)

## Welcome and Introduction

This session (Figure 2) consisted of:

- Introduction of facilitators and explanation of the workshop purpose as well as a brief overview of the following session activities.
- Brief overview of the ENDGAME project and the goals of the ERs.
- Short mention of project partners
- Explanation of Educational ERs concept followed by example of digital educational ER which had a purpose to visually describe the presented concept.

**Welcome and Introduction**



**Welcome & Introduction**

- Welcome to the workshop!
- Today's goal: **Co-design escape room narratives to combat disinformation**



**Welcome & Introduction**

- ENDGAME project
  - An innovative project aimed at **cultivating critical thinking and responsible digital citizenship** among European youth through **educational escape rooms** that simulate real-life scenarios of information consumption.
  - We aim to immerse participants in **time-sensitive, interactive, and challenging experiences**, where they will develop their skills in **identifying disinformation, recognizing AI-generated content, and understanding the implications of personal data exposure** on social media platforms.

**The partners**



**Welcome & Introduction**

- What Are **Educational Escape Rooms?**
  - Interactive, immersive learning experiences
  - Puzzle-based challenges with pedagogical objectives
  - Time-limited scenarios requiring critical thinking

**Welcome & Introduction**

- Digital escape room example:



Figure 2. Introductory session presentation slides

The participants were welcomed and encouraged to engage actively in the group discussions in breakout rooms. The participants had a chance to see the gameplay from "The hoax factory" ER game, previously created by Universidad Politécnica de Madrid and Maldita.es in one of their earlier projects (<https://escaperoom.maldita.es>). The shown example clearly illustrated how puzzles can teach players different skills.

## Presentation of Insights from WP2

This session (Figure 3) consisted of:

- Simple 5 minute "real-fake news "quiz
- Short discussion about the quiz results and participants impressions.
- A concise summary and highlight of recurring themes of disinformation narratives gathered through national workshops in Finland, Serbia, and Spain (for all countries and each individual country).
- Few examples of how these insights will potentially inform ER narratives.

**Insights from WP2**

- Country-level analysis
  - Analysis to identify prominent disinformation narratives in each country, particularly those affecting young people.
- Misinformation workshops
  - Organization of workshops to verify the identified pressing disinformation topics in each country.

**Recurring Themes Across Regions:**

Country	Challenge	Description
All countries	Dominance of social media as news source	Platforms like Instagram, TikTok, and YouTube are preferred by youth, but lack of source verification and algorithmic amplification increase exposure to manipulative content.
	Political and ideological polarization	Disinformation aims to erode trust in institutions, democratic processes, and marginalized communities by leveraging political division and emotional manipulation.
	Overlapping of disinformation and hate speech	Especially in immigration and identity-related topics, false claims are used to incite hostility toward minority groups, often reinforcing racism, Islamophobia, and anti-LGBTQIA+ sentiment.

**REAL - FAKE NEWS QUIZ**

- Test your disinformation detection skills!
- Decide if news article is real or fake.

<https://ahaslides.com/OLC70>

**QR Code:**

**Insights from WP2**

- Recurring Themes Across Regions:

Country	Challenge	Description
Spain	Low media trust and high news avoidance	Only 33% trust the news, and 44% of youth actively avoid it. Disinformation exploits this distrust and disengagement.
Finland	Paradox of high literacy vs. low self-trust	Despite high media literacy, many young Finns lack confidence in detecting false information and are vulnerable to global disinformation trends due to strong reliance on English-language media.
Serbia	Weak media literacy and polarized media environment	Ranked low in media literacy (31st of 40), with a highly polarized media landscape that spreads nationalist and anti-democratic disinformation. Youth are especially exposed via popular platforms like Instagram.

**How insights will potentially inform escape room narratives**

Insight from Research	Application in Escape Room Design
Generative AI literacy gaps	Feature AI-generated content puzzles where subtle inconsistencies must be spotted in seemingly authentic text, images, or audio.
Headline-only reading habits	Implement puzzles where misleading headlines contradict article content, rewarding players who read thoroughly.

Figure 3. Introductory session presentation slides

The “Real-Fake News” quiz consisted of 5 questions (combined with appropriate screenshots) based on different news articles and social media posts. Participants were asked to guess if the post in question is true or false, and results were presented to participants after each question. Each question had a time limit in order to simulate a potential ER challenge. The purpose of the quiz was to set the base for the rest of the workshop and give them hands-on experience. The quiz was implemented and conducted through AhaSlides platform and a total of **41 participants** were involved (Figure 4).

MY PRESENTATIONS / REPORT  
True or False Media Quiz

7 15 May 2025, 02:47 AM

Share Edit slides Export

41 Total participants 166 Total Reactions No submissions 72 % Accuracy No ratings

**QUIZ TIME!**

Figure 4. True or False quiz overall statistics

The following questions were asked:

- **Question 1:** Is this news article true or false? (Figure 5)

This question was based on a [huffpost.com](https://www.huffpost.com/entry/bc-eu-switzerland-water-pistols_n_67d053ade4b09796c9028e16) article about a politician who was “fined for buying pink water pistols online” and it was labeled as “True”. **65.63%** of all answers were accurate (some of the participants didn’t choose any of the options).

Source:

[https://www.huffpost.com/entry/bc-eu-switzerland-water-pistols\\_n\\_67d053ade4b09796c9028e16](https://www.huffpost.com/entry/bc-eu-switzerland-water-pistols_n_67d053ade4b09796c9028e16).

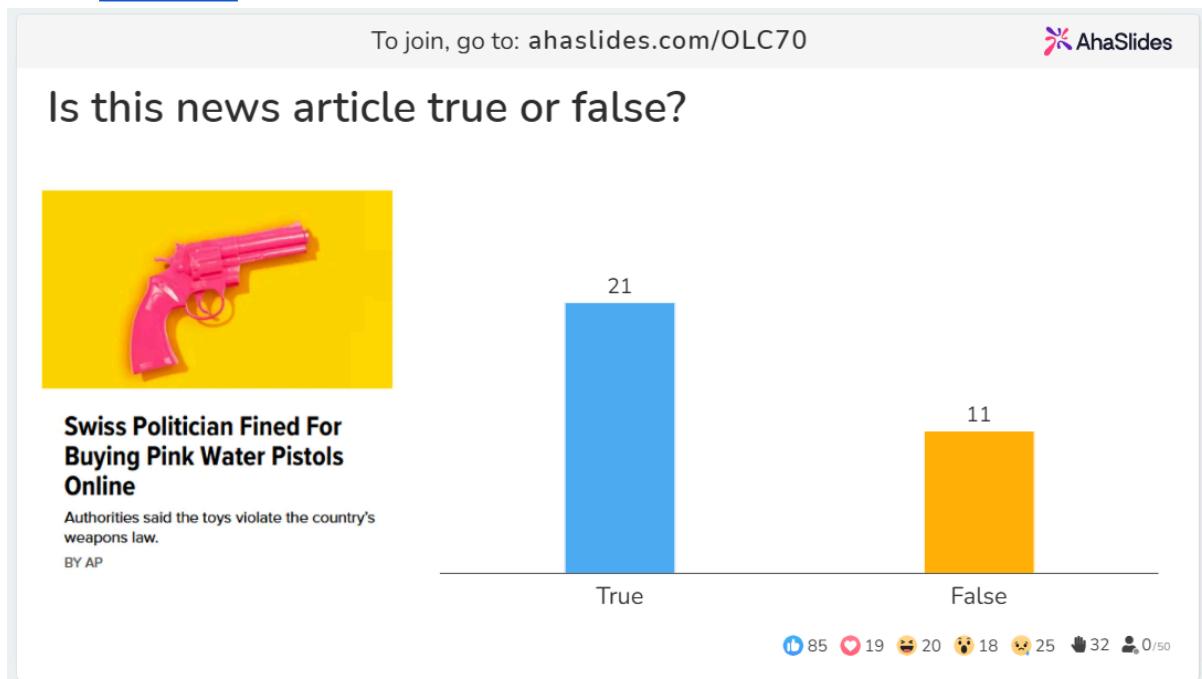


Figure 5. Real-Fake News quiz: Question 1 and statistics

- Some of the participants said that they didn’t expect that such action could be fined, while there was also a comment that “AP” marking beneath the image suggested that news may originate from Associated Press which led them to think it’s valid news from a trusted source.

- **Question 2:** Is this news article true or false? (Figure 6)

This question was based on a [waterfordwhispersnews.com](https://waterfordwhispersnews.com/2025/05/06/met-gala-sharon-osbourne-stuns-in-dress-made-from-used-idf-bullet-casings/) article about a tv personality wearing a dress with bullet casings while “EACH casing was used to execute a Palestinian” and it was labeled as “False”.

- **85.71%** of all answers were accurate (some of the participants didn’t choose any of the options)
- Source:  
<https://waterfordwhispersnews.com/2025/05/06/met-gala-sharon-osbourne-stuns-in-dress-made-from-used-idf-bullet-casings/>.

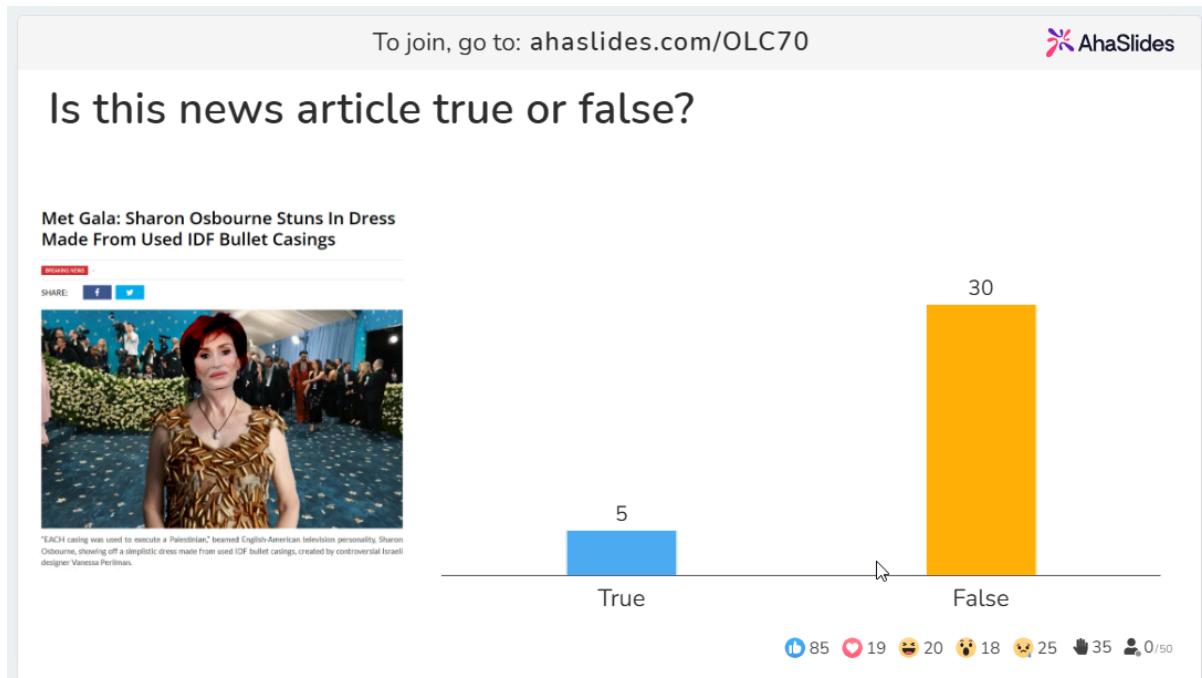


Figure 6. Real-Fake News quiz: Question 2 and statistics

- **Question 3:** Is this image true or false? (Figure 7)  
 This question was based on a [boredpanda.com](#) article about “Fake Viral Photos People Believed Were Real” and it was labeled as “False”.
  - **85.29%** of all answers were accurate (some of the participants didn’t choose any of the options).
  - **Source:** <https://www.boredpanda.com/fake-news-photos-viral-photoshop/>



Figure 7. Real-Fake News quiz: Question 3 and statistics

- **Question 4:** Is this news article true or false? (Figure 8)  
 This question was based on a [nypost.com](#) article about testing of a humanoid robot's

capabilities that went wrong and put some of the workers in danger. It was labeled as "True".

- **80.00%** of all answers were accurate (some of the participants didn't choose any of the options).

- **Source:**

<https://nypost.com/2025/05/05/tech/violent-humanoid-robot-snaps-attacks-factory-workers-video/>

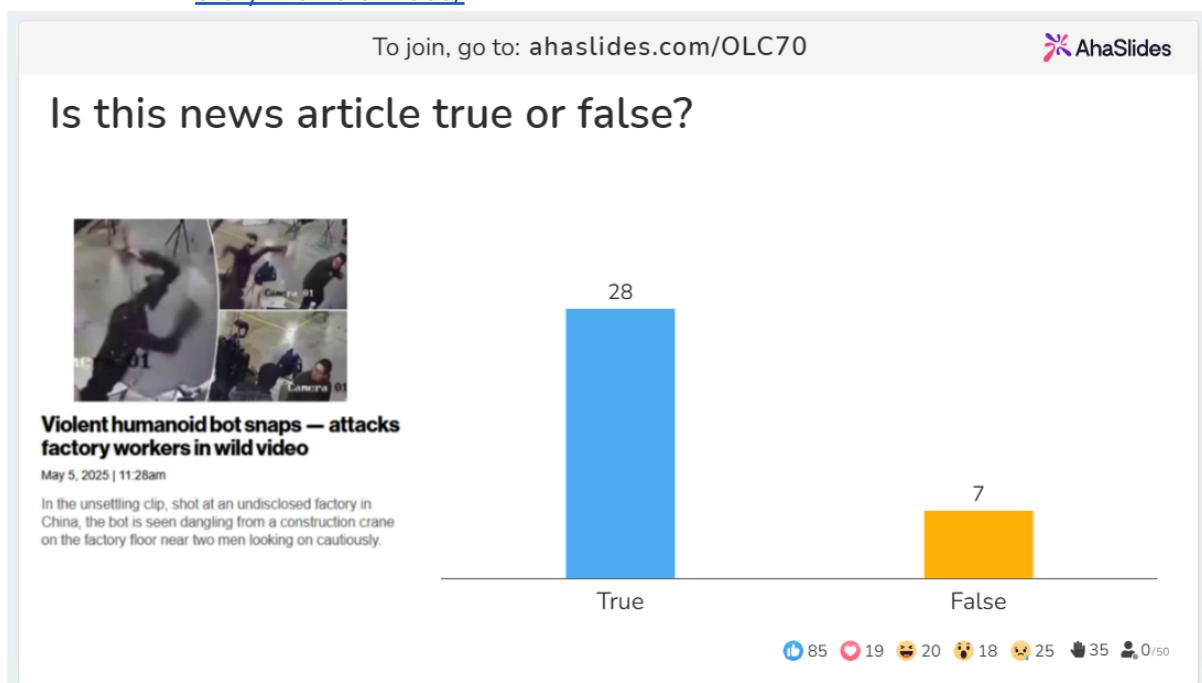


Figure 8. Real-Fake News quiz: Question 4 and statistics

- There was an interesting discussion about this news initiated by a participant from China, who didn't hear about this news and made a guess that it's a false news. Most of the participants agreed that the news and title are a bit exaggerated. One participant said that he wasn't sure about this one, but the previous two fake news led him to assume that this one is true.

➤ **Question 5:** Is this social media post true or false? (Figure 9)

This question was based on a "God Quotes Inspirational" group Facebook post about the house (presented in the multiple photos) which remained intact in California fire by the will of God because the homeowner is a good christian and it was labeled as "False".

- **76.47%** of all answers were accurate (some of the participants didn't choose any of the options).

- **Source:**

<https://www.facebook.com/groups/462726891177455/posts/1868213420628788/>

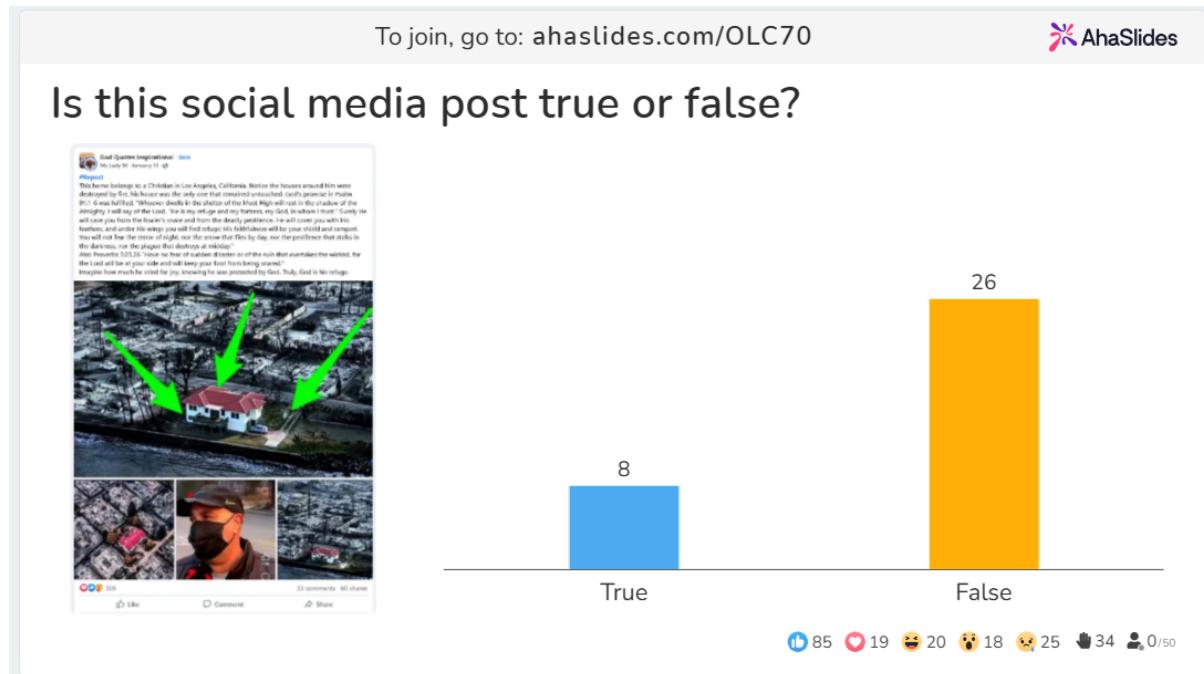


Figure 9. Real-Fake News quiz: Question 5 and statistics

- This question also opened some discussion regarding whether everything written in the post was fake, especially having in mind fate and religion. An agreement that photos presented in the post were manipulated suggests that the core event described in the post is false. One of the participants said that he wanted to read the whole article but didn't have a chance due to image size and given time.

- **Summary:** Preparing this quiz was unexpectedly troublesome because it was not easy to find appropriate fake news material online. The goal was to find some global fake news that may potentially confuse participants, but most of the fake news search results were clearly labeled as fake and therefore not usable.
  - **29.27% of participants gave the accurate answers to all questions** (Figure 10), 21.95% made only 1 mistake, 17.07% gave 3 accurate answers, 9.76% had 2 accurate guesses while remaining 17.07% had 1 or no accurate answers (where 1 of them didn't submit answers for any of the questions). Total accuracy was 72% (Figure 10)
  - **The time limit represented a big challenge for most of the participants.** Many mentioned that the clock pushed them to make mistakes, which suggests that this kind of challenge can be used to potentially improve critical thinking. Everyone agreed that it was an interesting experience and had a positive impression about the quiz.

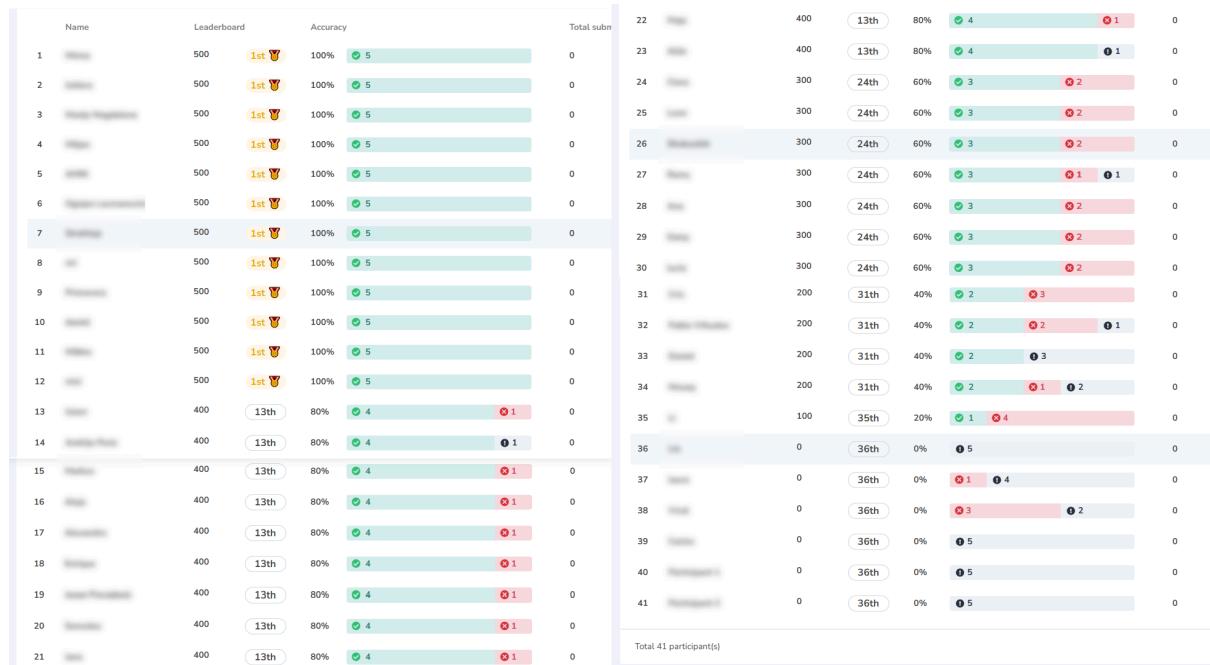


Figure 10. True or False quiz score board of all participants (names are blurred for privacy reasons)

At the end of this session, the facilitator separated the main session into 3 parallel breakout rooms, based on a list of registered users (15 participants per room at most including facilitators). The participants were spread in a way that maximized diversity in each room. The breakout rooms were used to catch ideas within sessions Brainstorming Narrative Ideas, and Puzzle and Skill Mapping. Figure 11 shows participants in Breakout room 2.

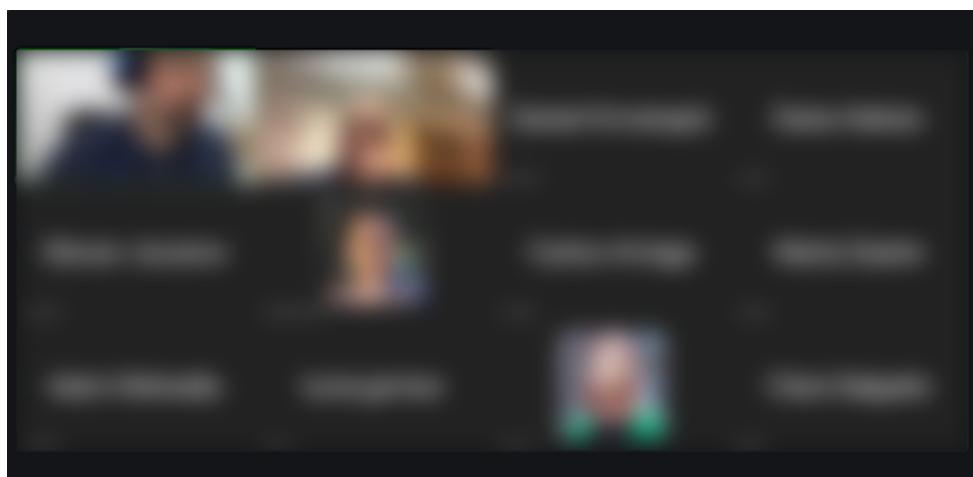


Figure 11. Screenshot of Breakout room 2 participants (areas are blurred due to privacy policy)

## Brainstorming Narrative Ideas



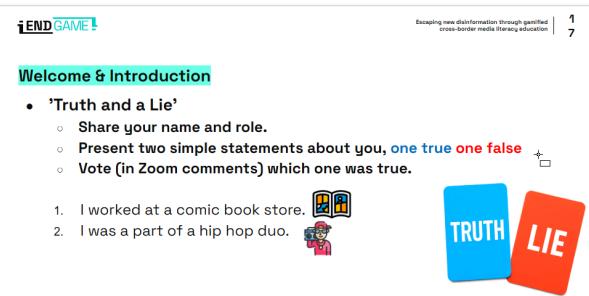
**Brainstorming Narrative Ideas**

(Breakout rooms)

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**Welcome & Introduction**

- 'Truth and a Lie'
  - Share your name and role.
  - Present two simple statements about you, one true one false
  - Vote (in Zoom comments) which one was true.

- I worked at a comic book store.
- I was a part of a hip hop duo.



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**Brainstorming Narrative Ideas**

- Which visual style would you rather see?



**Pixel art**

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**Brainstorming Narrative Ideas**

- Which visual style would you rather see?

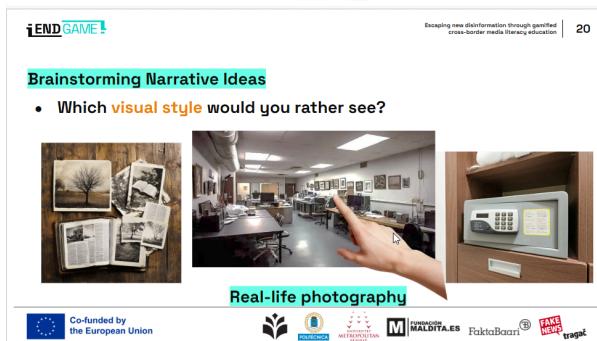


**Illustrative**

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**Brainstorming Narrative Ideas**

- Which visual style would you rather see?



**Real-life photography**

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**Brainstorming Narrative Ideas**

1. Pixel art
2. Illustrative
3. Real-life photography



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Figure 12. Brainstorming Narrative Idea session presentation slides – First part

**Brainstorming Narrative Ideas**

- Which **theme** would you choose for an escape room narrative?
  - Time Travelers' Archive: Fix historical "glitches" created by misinformation throughout time
  - Social Media Storm: Navigate a crisis where trending hashtags contain misleading information
  - Conspiracy Busters: Debunk an elaborate conspiracy theory before it goes mainstream
  - ...



**Brainstorming Narrative Ideas**

- Our current idea: **Media literacy and disinformation detection**
  - You are part of a newly formed *Digital Intelligence Team* working with an independent investigative network.
  - An **anonymous group** is preparing to unleash a **surge of coordinated disinformation** designed to manipulate public perception during an upcoming major event.



**Brainstorming Narrative Ideas**

- Which **real-life setting** would you choose for this escape room
  - Newsroom
  - Basement (headquarters of anonymous group)
  - Media Monitoring Command Center at Event location
  - Classroom
  - Influencer's studio
  - Public transport
  - City (multi-location)
  - ...



**Brainstorming Narrative Ideas**

- Idea 1: **Newsroom archive**
  - A series of interconnected workspaces:
    - Archive Room - Historical document storage with newspapers, microfilms, and telegrams
    - Photo Lab - Image analysis space with editing computers, printers, and forensic tools
    - Newsroom - Fast-paced media environment with bulletin boards, articles, and broadcast equipment
    - Server Room - Technical space housing digital infrastructure and the "info-bomb" device



**Brainstorming Narrative Ideas**

- Idea 2: **Basement**
  - A series of interconnected workspaces:
    - Computer Room - Computers that host all the misinformation pieces and incriminating information
    - Meeting room - Discussion rooms with whiteboards and sketches
    - Bot Room - Technical space where they host the servers of the misinformation bots



**Brainstorming Narrative Ideas**

- Idea 3: **Media Monitoring Command Center during a major event**
  - A series of interconnected workspaces:
    - Media Feed - Real-time feed of social media information and misinformation
    - Server Room - Houses the network servers, heavily secured and climate-controlled
    - Break room - A misleadingly calm space that contains subtle but important hidden clues, for example, discovering a mole.



Figure 12. Brainstorming Narrative Idea session presentation slides – Second part

The facilitator of each breakout room started this session with a simple “truth and a lie” game (Figure 13), where participants could volunteer, share their name and role and present two simple statements out of which only one is true, and other participants need to guess which one. The facilitator presented the first pair of statements to start the game.

## Welcome & Introduction

- **'Truth and a Lie'**
  - Share your name and role.
  - Present two simple statements about you, **one true one false**
  - Vote (in Zoom comments) which one was true.

1. I worked at a comic book store.
2. I was a part of a hip hop duo.



Figure 13. Presented “Truth and a Lie” game rules

## Breakout rooms playthrough examples:

- Pair provided by the facilitator: 1. "I worked at a comic book store" 2. "I was a part of a hip hop duo". Most of the participants made an accurate guess, and guesses were based on different factors, from the design of the facilitator's headphones down to "it sounded more interesting".
- Pair provided by the participant: 1. "I have a twin sister" 2. "I have a parrot". Participants were divided, and some even suggested that they are both true. The first statement was true, and some suggested that it would be unusual for someone to think of such a statement if he/she didn't have a twin sister in the first place.
- Pair provided by participant: 1. "I like Games" 2. "I have a bald friend". Many comments suggested that both may be true since they are both easily plausible. One participant suggested that "we all have at least one bald friend". The first statement was true.
- Pair provided by the facilitator: 1. "I was at the premier of every Star Wars movie" 2. "I was in the local newspaper for the way I was dressed". Most of the participants guessed correctly by choosing the second option. The most common reason for their correct choice was that the facilitator looked too young to have attended the premiere of all the Star Wars movies.
- Pair provided by the participant: 1. "I do handstands every day as a hobby" 2. "I sold a cockroach in New York City for 5\$". Almost all of the participants guessed that the second statement was true. Most of them commented that they chose it because they couldn't imagine someone having handstands as a hobby.
- Pair provided by the participant: 1. "I played football for my favourite team "Red Star"" 2. "I sing as a hobby". Even though this may seem like an obvious answer, most of the participants got it wrong and voted for the first statement. The main reason was that the speaker did not strike them as the singing type.

After the "ice breaker" interaction, the facilitator asked the following questions:

- Which visual style would you rather see? And presented three options with examples: pixel art, illustrative and real-life photography (Figure 12).
- Which theme would you choose for an ER narrative? Different examples were provided to give basic ideas to the participants.
- Which real-life setting would you choose for this ER? Also followed by different examples and ideas.

## Breakout room 1

### Visual style

Participants voiced their opinions in vocal or through Zoom chat for the question about the visual style. They were able to choose more than one option.

Illustrative style won with 5 votes, pixel art was second with 4 and real-life photography only had 1 vote.

Few participants agreed that pixel art style can potentially represent a big challenge due to technical requirements. Many said that they like illustrative overall because it feels more "game like". The real life photo was "just the photo" and didn't gather much sympathy.

One participant suggested that AI can be useful for generating illustrative graphical assets for a game, but almost everyone expressed their negative opinion regarding the potential use of AI-generated art in ER games which will be created. This can be very important information.

## Narrative

**Narrative choice** was a second question and first interaction of participants with AhaSlides Live Word Cloud Generator. Results can be seen in Figure 14.

**Time traveling**, where players correct misinformations from different time periods and **Robot Troll Factory**, where robots on a production line create fake news for social media, were the two most popular options among participants.

After the cloud discussion, the facilitator presented one of the ideas the team previously created and asked for opinions.



Figure 14. Word cloud for narrative theme ideas – Breakout room 1

## Real life setting

**Real life setting** question brainstorming results can be seen in Figure 15.

**Classroom** and **Newsroom** were the top choices many participants agreed on. The classroom was suggested as a good option for younger players since it will be easier for them to relate with such surroundings, while the newsroom was a clear choice for many since it's the place where news is created.

After the cloud discussion, the facilitator presented several ideas that the team had previously created and asked for opinions. Participants were mostly indecisive since all 3 ideas sounded interesting to them.

Which real-life setting would you choose for this escape room?

Madrid 28-04-2025

city multi-location

classroom tiktok interface  
agency headquarters  
newsroom

A word cloud visualization on a digital platform. The background features a light blue gradient with abstract white shapes. On the left, there's a vertical column of text: 'Madrid 28-04-2025' at the top, followed by 'city multi-location' in blue, and then three large words: 'classroom', 'tiktok interface', and 'agency headquarters' stacked vertically, with 'newsroom' positioned below them. The word 'classroom' is the largest and most prominent. The interface includes standard Zoom-like controls (back, forward, search, etc.) and a participant count of '11' with '6/50' in a green box.

Figure 15. Word cloud for real-life setting ideas – Breakout room 1

## Breakout room 2

### Visual style

Some of the participants shared their thoughts by both speaking and via Zoom chat while discussing the preferred visual style for the game. During this discussion, multiple choices were allowed. Pixel art received the most votes with 6, illustrative art followed closely with 5, and real-life photography trailed with just 1 vote. Many participants noted that the choice of visual style should depend on the overall mood and tone of the game. For example, pixel art was seen as a great fit for retro or light-hearted themes, while illustrative art was considered more versatile and expressive. Some participants commented that if illustrative art were chosen, a hand-drawn look would suit it best, adding warmth and personality to the experience.

The **art style** brainstorming process began with a word cloud activity, serving as the participants' first interactive task. As shown in Figure 16, a variety of ideas were contributed, including concepts such as *illustrative*, *anime*, *detective-style*, *fantasy*, and *film noir*. This exercise encouraged creativity and highlighted trends in participants' interests.

# Video game art style

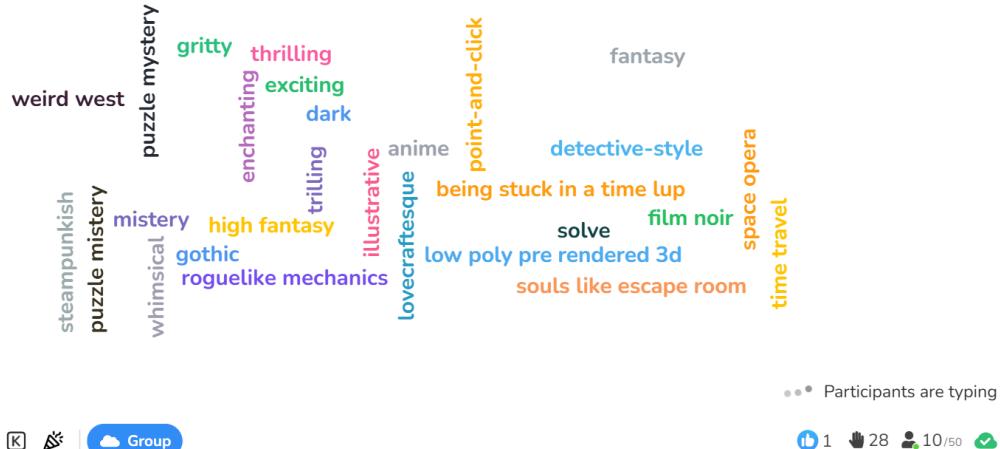


Figure 16. Word cloud for art style ideas – Breakout room 2

## Narrative

**Narrative** direction was the second question posed to participants and served as their first interactive activity using a word cloud. The results, shown in Figure 17, reflect a broad range of creative storytelling ideas. Prominent suggestions included “*avoiding a catastrophe*,” “*saving someone*,” and “*uncovering a conspiracy*”. Participants also proposed imaginative concepts such as *entering a tale in a book*, *travelling multiverses*, and *playing as an aware AI*. Among the suggestions, “*avoiding a catastrophe*” and “*uncovering a conspiracy*” emerged as the most favored narrative directions.

# Narrative



Figure 17. Word cloud for narrative ideas – Breakout room 2

## Real life setting

**Real life setting** brainstorming results are shown in Figure 18. Urban locations were the most popular, with “*industrial complexes*” and *cyberpunk-inspired* settings generating strong interest. “*Cabin in the woods*” and “*high-tech laboratory*” were also favored for their storytelling potential. When the facilitator introduced pre-developed ideas like “*news publisher building*” and “*city and public transport*” participants were enthusiastic but found it hard to choose, as all options seemed equally compelling.

## Setting

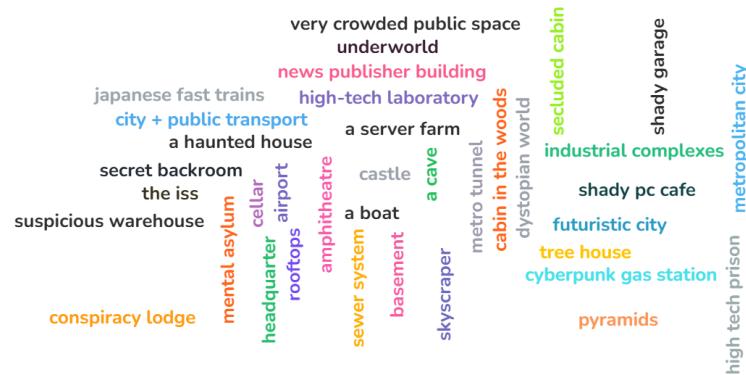


Figure 18. Word cloud for real-life setting ideas – Breakout room 2

## **Breakout room 3**

## Visual style

Impressions regarding **visual style** choice were similar to the previous two breakout rooms. An interesting addition was the suggestion of mixing media and using pixel art for scene and characters while news materials should be real life photography. Many agreed that an illustrative approach would provide better clarity of the scene.

## Narrative

**Narrative discussion** was also similar to other breakout rooms, and one of the new contributions was the idea of inspecting online products and product reviews and looking for fakes. The idea of investigating misinformation but without relying on digital devices due to a total blackout (similar to the event that recently occurred in Spain) was also presented.

## Real life setting

Real-life setting choice highlight was [Media War Room](#) – players are agents fighting a social media war. The room is filled with screens with different public opinion survey results.

## Puzzle and Skill Mapping

The goal of this breakout session was to link media literacy skills (e.g., identifying manipulated images, evaluating sources) to potential puzzle types, Figure 19. Facilitators presented one valid puzzle with mapped skills for easier understanding (Table 4), and guided groups to suggest specific puzzle ideas tied to the narrative.

**Puzzle and Skill Mapping**

(Breakout rooms)

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**Puzzle and Skill Mapping Example**

Puzzle	Required Skill	Positive learnings outcome
Spot-the-difference: In the photo labelling, which parts of the photo have been digitally manipulated (deepfakes, photoshopped items, false context) and find part of the code.	Basic understanding of image manipulation techniques Digital Media Literacy Contextual Analysis	Improved ability to recognize manipulated media Greater skepticism towards visual content. Empowerment to question authenticity of viral or misleading content. Enhanced ability to evaluate information within its broader context and identify inconsistencies.

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**Puzzle and Skill Mapping**

- What **puzzle types** (visual clues, ciphers, logic problems) could teach these skills?
  - time limit
  - precision challenge
  - finding hidden object
  - matching puzzle
  - context analysis
  - ethical dilemmas
  - ...

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**Puzzle and Skill Mapping**

- How do we **avoid revealing solutions** in a too-obvious or repetitive way?
  - progressive difficulty
  - multiple solutions
  - misleading clues
  - ...

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**Puzzle and Skill Mapping**

- Which **skill** would you like to see challenged and improved?
  - OPERATE devices & software
  - EXPLORE applications
  - FIND information
  - CREATE with media
  - CONNECT through media
  - DISCUSS media
  - UNDERSTAND media
  - REFLECT on media usage

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**Puzzle and Skill Mapping**

Number of papers covering this topic in review paper: "Escape Rooms for Media Literacy: A Systematic Literature Review"

Skill	Number of papers
OPERATE devices & software	10
EXPLORE applications	10
FIND information	10
CREATE with media	10
CONNECT through media	10
DISCUSS media	10
UNDERSTAND media	10
REFLECT on media usage	10

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Figure 19. Puzzle and Skill mapping session presentation slides

The discussion consisted of the following questions:

- **What puzzle types** (visual clues, ciphers, logic problems) could teach these skills? (e.g. time limit, precision challenge, finding hidden object, matching puzzle, context analysis, ethical dilemmas...)
- How do we **avoid revealing solutions** in a too-obvious or repetitive way? (progressive difficulty, multiple solutions, misleading clues, ...)
- **Which tools** (e.g., image comparison, source tracing) could support interactivity?
- **Which skill** would you like to see challenged and improved? Facilitators presented possible options that are given in the upcoming list:
  - **OPERATE** devices & software
  - **EXPLORE** applications
  - **FIND** information
  - **CREATE** with media
  - **CONNECT** through media
  - **DISCUSS** media

- UNDERSTAND media
- REFLECT on media usage

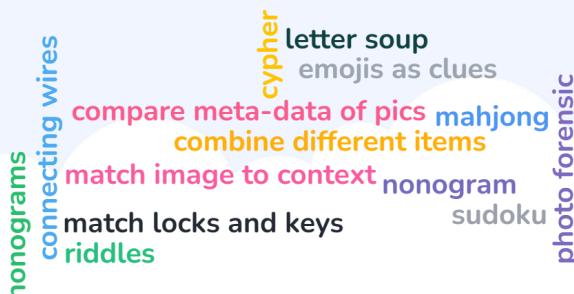
Table 4. Puzzle and Skill Mapping Example

Puzzle	Required Skill	Positive learnings outcome
<b>Spot-the-difference:</b> In the photo lab, identify which images have been digitally manipulated ( <i>deepfakes, photoshopped items, false context</i> ) and find part of the code.	Basic understanding of image manipulation techniques	Improved ability to recognize manipulated media
	Digital Media Literacy	Greater skepticism towards visual content. Empowerment to question authenticity of viral or misleading content.
	Contextual Analysis	Enhanced ability to evaluate information within its broader context and identify inconsistencies.

## Breakout room 1

- **Puzzle type question** got many different and interesting answers (Figure 20)

**What puzzle types (visual clues, ciphers, logic problems) could teach these skills?**



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14 6/50

Figure 20. Word cloud for puzzle type ideas – Breakout room 1

Various ideas were presented by participants, some more conventional, others more original.

The **nonogram** idea was one of the more unusual ones. "Nonograms, also known as Hanjie, Paint by Numbers, Griddlers, Pic-a-Pix, and Picross, are picture logic puzzles in which cells in a grid must be colored or left blank according to numbers at the edges of the grid to reveal a hidden picture".

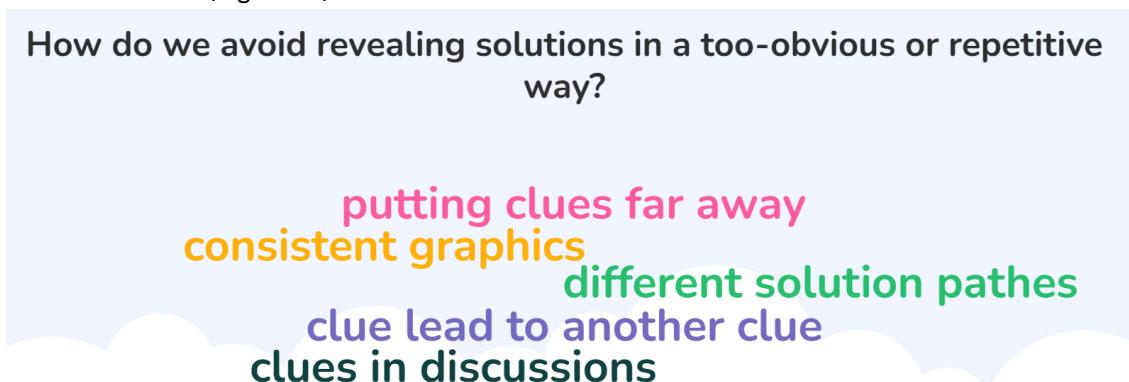
The **Sudoku** puzzle was also an interesting suggestion, keeping in mind that the player first needs to find parts of the Sudoku before solving it.

**Emoji based** and **Letter Soup based** puzzles were also suggested and discussed.

Colored wires combined with letters were a more straightforward but overall positively accepted idea.

- How to make answers reveal more interesting and less repetitive received many different answers (Figure 21).

### How do we avoid revealing solutions in a too-obvious or repetitive way?



A word cloud with various colored text on a light blue background with white clouds. The words are:

- putting clues far away
- consistent graphics
- different solution paths
- clue lead to another clue
- clues in discussions
- misleading clues

Figure 21. Word cloud for ideas about revealing solutions methods – Breakout room 1

One participant suggested that **clues should be layered**. For example, a clue shouldn't directly reveal a solution, but it should be a representation of an actual clue (there's a clue within a clue) or at least lead to the next clue.

**Graphics should be consistent** to avoid obvious difference spotting of solution. UI should also be consistent so players can't only interact with valid solutions but with wrong ones as well.

Misleading clues were discussed as a valid way to make solutions more challenging.

**Multiple paths to a solution** also got positive feedback. The idea that you can find potential code for a door in two different places hidden behind two different puzzles got approval as a good gameplay option.

- Which skills would participants like to challenge and improve brought **critical thinking** as the most important one (Figure 22), and **teamwork** as the second one. These skills were not among recognized media literacy skills, but it's still valuable information.  
**Finding and navigating through new information, reflecting on usage** and **learning how to use new apps** were also presented as answers.  
An unusual suggestion was **stamina**, but the participant explained that the idea is to improve someone's patience and capability to hold on until the end, and maintain focus during the challenges.



Figure 22. Word cloud for skill choice – Breakout room 1

## Breakout room 2

- The **puzzle type** brainstorming results are shown in Figure 23. A wide range of ideas was shared, from classic formats to more analytical challenges. "*Identifying fake images*" and "*evidence matching*" were among the most popular, valued for promoting critical thinking. "*Pattern recognition*" and "*find the difference*" were also well received for their visual and interactive elements. More traditional ideas like "*anagrams*" and "*finding the info online*" added familiarity, while "*identify manipulation*" introduced a more investigative dimension.

## Puzzle idea

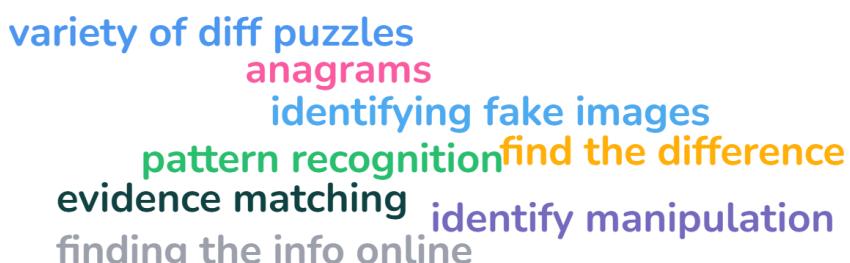


Figure 23. Word cloud for puzzle type ideas – Breakout room 2

- How to make **answers reveal more interesting** and **less repetitive** received many different answers. The most widely agreed-upon idea was to introduce **red herrings—puzzles or clues that intentionally lead players in the wrong direction**. These elements wouldn't

contribute to solving the main challenge but would add depth and entertainment. Participants also supported the idea of including puzzles that serve no real purpose other than being fun distractions. Additionally, the group discussed the value of occasionally providing players with incorrect information to increase the challenge and encourage deeper critical thinking.

- Skills participants would like to challenge and improve were discussed verbally and via Zoom chat. The most commonly mentioned abilities included finding information quickly and operating devices or software efficiently. Understanding media and reflecting on its usage were also noted as important skills. One participant emphasized the challenge and enjoyment of connecting clues to make progress, highlighting it as a fun but demanding aspect of gameplay. While some of these skills align with media literacy, others expand the focus to include practical and problem-solving abilities, offering valuable insights for future game design.

### Breakout room 3

- Puzzle concept question sparked many interesting ideas. From the suggestion that each playthrough should add some points to the total score, which would potentially increase the replayability aspect. Score points could be later potentially used to make some puzzles easier. There were photo manipulation based suggestions, similar to the ones previously presented in Breakout room 1 discussion. Unique one was the use of a phone book with various information sources – a player would have to figure out who to call to confirm the solution since a wrong call can give misleading results.
- The main suggestion for revealing solutions was branching narratives so it's not always clear which approach or "road" is the right one.
- Regarding skill challenges, an interesting contribution was challenging players' belief/personal opinion strength. The player can provide an opinion through some choices, and then the game could challenge them and try to make him change the opinion through some media content.

At the end of this session we closed breakout rooms and "teleported" all participants back to the common session where we continued with discussion about Inclusion, accessibility and wrap-up.

### Inclusion and Accessibility Discussion

The goal of this session (Figure 24) was to ensure that the room design reflects diverse realities. Key questions that were raised during this session were:

- How would you keep visuals, names, and environments free of stereotypes?
- How can we make the room accessible (e.g., readability, alternative text, color contrast, sound)? What assumptions are we making about players' abilities, knowledge, or the tools they can use?
- Are we including experiences relevant to marginalized communities? Who might be excluded by our current design choices?

The image shows two adjacent slides from a presentation. Both slides have a light blue header bar with the 'iEND GAME!' logo and the title 'Escaping new disinformation through gamified cross-border media literacy education'. The left slide, page 34, has a teal header section containing the title 'Inclusion and Accessibility' in white. Below this, there is a row of logos for partners: Co-funded by the European Union, Politecnico di Milano, METROPOLITAN, FAKTABARU, and FAKE NEWS tragedia. The right slide, page 35, features a large blue circular icon of a person in the top right corner. It has a teal header section titled 'Inclusion and Accessibility'. Below this is a bulleted list of questions: 1. How would you keep visuals, names, and environments free of stereotypes? 2. How can we make the room accessible (e.g., readability, alternative text, color contrast, sound)? What assumptions are we making about players' abilities, knowledge, or tools they can use? 3. Are we including experiences relevant to marginalized communities? Who might be excluded by our current design choices? The bottom of both slides contains the same partner logos as the left slide.

Figure 24. Inclusion and Accessibility session presentation slides

Most of the participants agreed that these themes are important and that they should be considered during the development process. One of the participants shared the link toward a website which collects all updated guides on accessibility in video games (<https://gameaccessibilityguidelines.com/basic/>) which is a valuable contribution. Also, he commended that way to potentially avoid discrimination and stereotypes is the use of made up humanoid characters (similar to Simpsons or South Park tv shows). Another idea was to avoid stereotypes by presenting more than one stereotype element at the same time, for example if a game showcase is a house in Finland, it should show multiple houses and not just one. More common suggestions were also presented, like using simple language, being careful about color choices for players with color blindness, and using more reading friendly fonts for players with dyslexia. Information should be presented through more than one information channel, for example, colors can be written in text along with visual representations and even voiced through narration. Technical requirements should also be taken into consideration and optimized for players with potentially slower internet connections and/or older devices.

## Wrap-Up and Next Steps

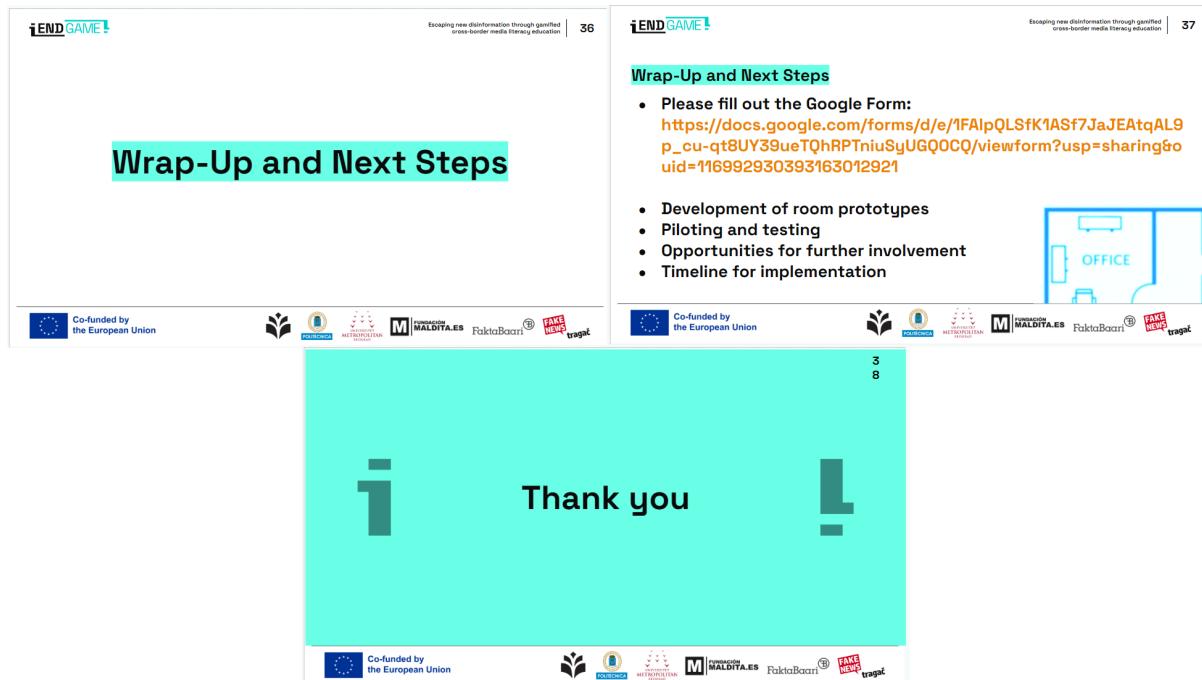


Figure 25. Wrap-up and Next Steps session presentation slides

At the beginning of the session, participants were asked to fill the Google form presented in Table 5:

Table 5. Wrap-Up Google Form

<b>Instructions</b>
Please fill out the form. Be creative, and don't hesitate to share your ideas.
<b>1. Visual Style Selection</b>
<b>Choose one or more styles you would like to see:</b>
<ul style="list-style-type: none"><li>● <input type="checkbox"/> Pixelart</li><li>● <input type="checkbox"/> Illustrative art</li><li>● <input type="checkbox"/> Real-life photography</li></ul>
<b>2. Theme Selection</b>
<b>Choose one primary theme from the recurring disinformation challenges:</b>
<ul style="list-style-type: none"><li>● <input type="checkbox"/> Deep Fakes and manipulated media</li><li>● <input type="checkbox"/> Political misinformation/election interference</li><li>● <input type="checkbox"/> Health and science misinformation</li><li>● <input type="checkbox"/> AI-generated content</li></ul>

- Climate misinformation
- Other: \_\_\_\_\_

### Why is this theme particularly relevant?

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### 3. Setting & Environment

#### Choose a real-life setting for your ER:

- Newsroom/Media organization
- Social media company headquarters
- University/classroom
- Government office
- Influencer's studio
- Public transportation
- Other: \_\_\_\_\_

#### Shortly describe the chosen environment:

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### 4. Character Roles

#### Who can players be in your scenario?

- Journalists/reporters
- Students/researchers
- Social media managers
- Fact-checkers
- Government officials
- Ordinary citizens
- Other: \_\_\_\_\_

#### Backstory for chosen character:

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### 5. Game Objective

#### What is the central goal players must achieve?

- Stop viral fake news from spreading
- Find the source of disinformation
- Restore trust in legitimate media
- Prevent election interference

- Protect someone victimized by disinformation
- Other: \_\_\_\_\_

**What if players succeed:**

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**What if players fail:**

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## 6. Create your puzzle

**Choose Media Literacy Skill:**

- OPERATE devices & software
- EXPLORE applications
- FIND information
- CREATE with media
- CONNECT through media
- DISCUSS media
- UNDERSTAND media
- REFLECT on media usage
- Other: \_\_\_\_\_

**Puzzle Type:**

- Visual analysis
- Source verification
- Data interpretation
- Logical reasoning
- Pattern recognition
- Ethical decision-making
- Other: \_\_\_\_\_

**Difficulty Level:**

- Easy
- Medium
- Hard

**Short description:**

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**Learning Objective:**

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**25 participants** filled out the Google form which provided additional data for the development process. Results are presented in the following images (Figure 26–33) and comments. Complete answers are provided in Appendix A.

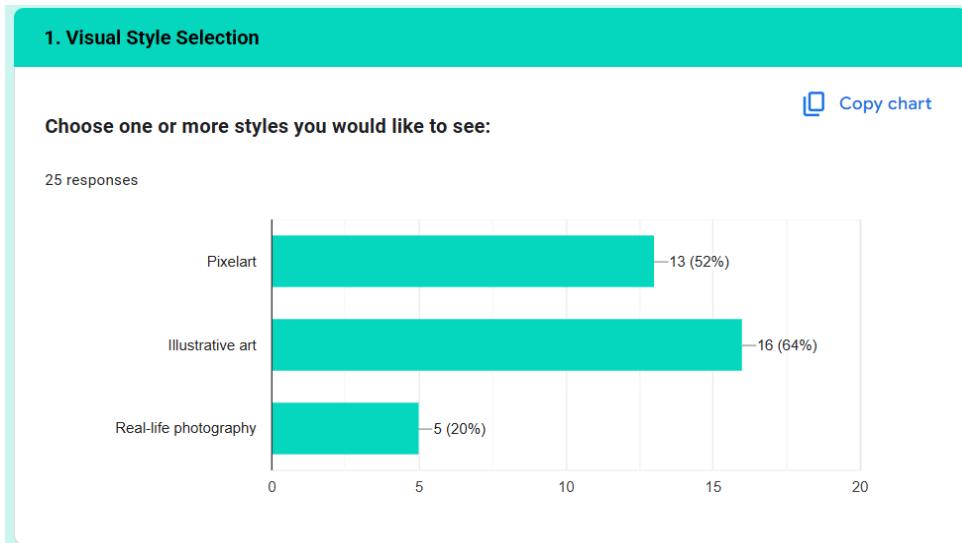


Figure 26. Visual style selection responses in Google form

Choices in Google form match the voiced opinions during the breakout room sessions, and the illustrative approach remained the favorite choice, followed by pixel art, Figure 26.

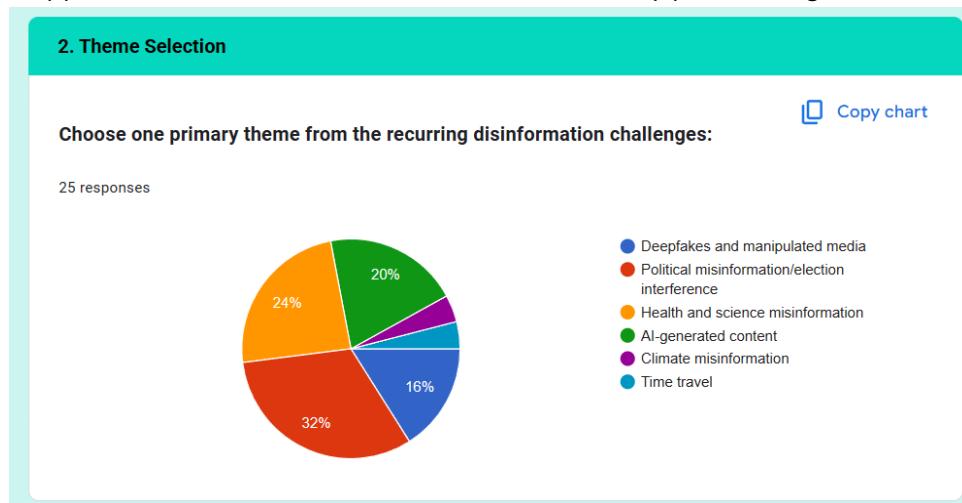


Figure 27. Theme selection responses in Google form

Political misinformation/election interference and Health and science misinformation gathered the most votes, followed by AI-generated content and Time travel, Figure 27. In textual answers, participants chose misinformation, especially AI-generated, as a critical issue due to its impact on emotions, politics, health, and public trust. It's timely, global, and relevant, particularly in local regions, and highlights the urgent need for media literacy.

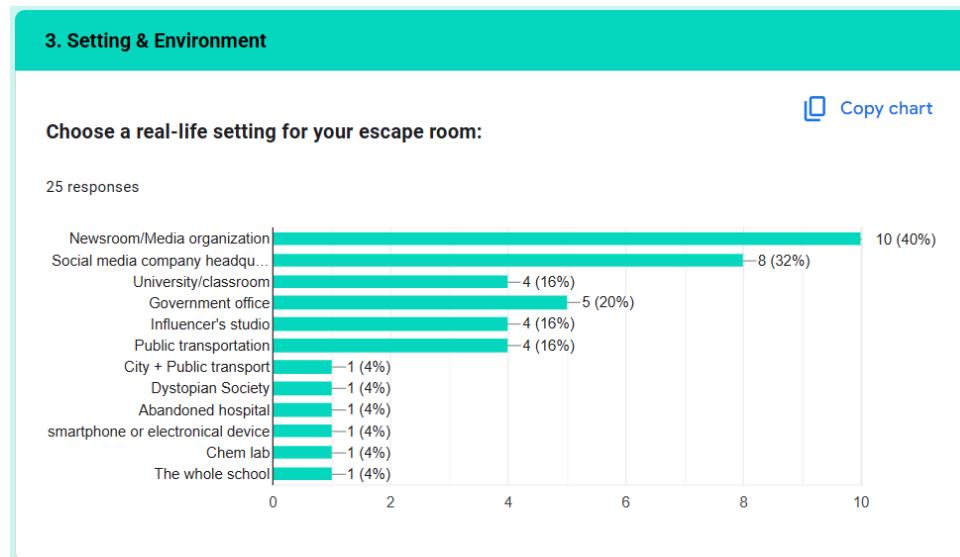


Figure 28. Setting and Environment selection responses in Google form

Newsroom/Media organization and Social media company headquarters were the most voted real-life settings, Figure 28. In written answers, chosen settings include government offices, newsrooms, social media hubs, and universities—places tied to the creation or exposure of misinformation. Some suggested imaginative spaces like dark labs or trains, all designed to support immersive, story-driven gameplay.

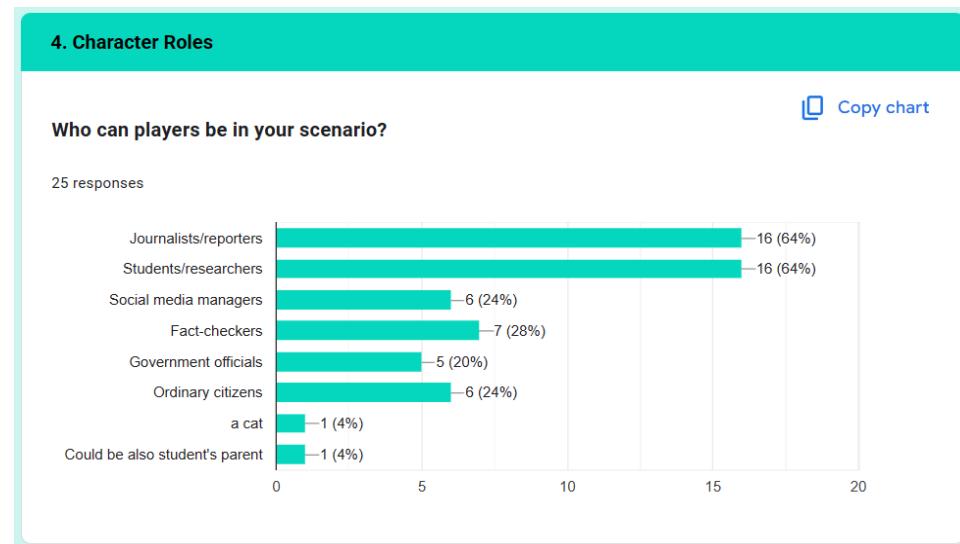


Figure 29. Character roles selection responses in Google form

Top choice for player role in gameplay scenario was shared between Journalists/reporters and Students/researchers, which is also in line with breakout rooms discussions, Figure 29. In written answers, characters are often students, journalists, or investigators uncovering misinformation. Motivations range from personal loss to a sense of justice, with some acting alone and others in teams. A few creative roles include time travelers and AI detectives.

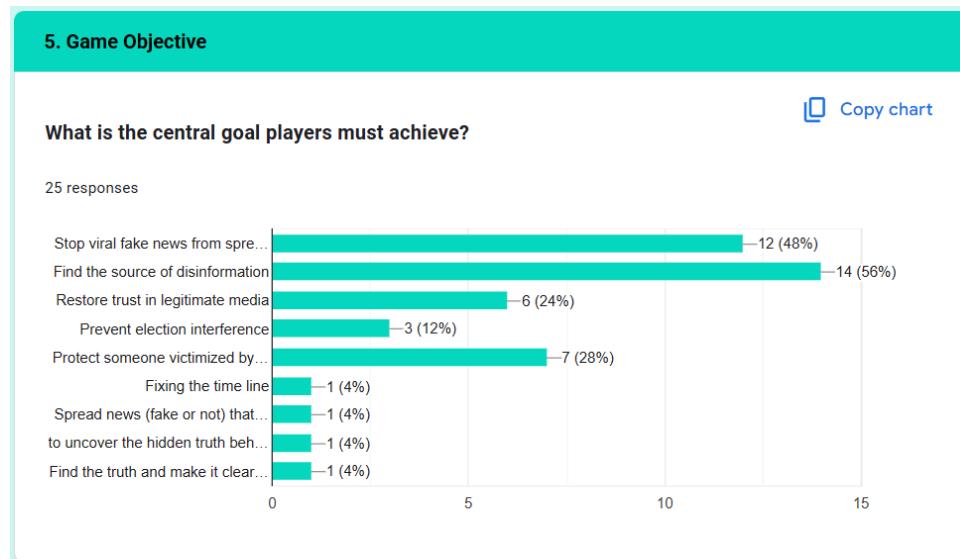


Figure 30. Game objective selection responses in Google form

The central goal of the players in the escape room, based on participants' votes, was to find the source of disinformation and stop viral fake news, Figure 30.

For participants, players' success means uncovering the truth, exposing wrongdoers, and educating others. Players may earn recognition or bring justice, leading to societal improvement or personal growth. This emphasizes the real-world value of truth and awareness. On the other hand, players' failure results in negative consequences—misinformation spreads, truth is buried, or dystopian outcomes emerge. Some paths offer retry chances, but all highlight the stakes of ignoring or failing to challenge false information.

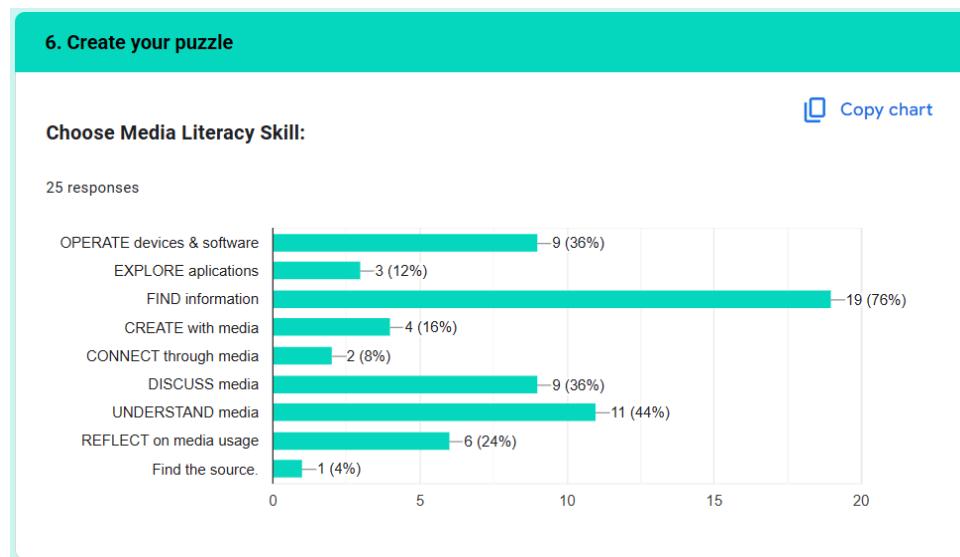


Figure 31. "Create your puzzle" responses in Google form – Media literacy skill

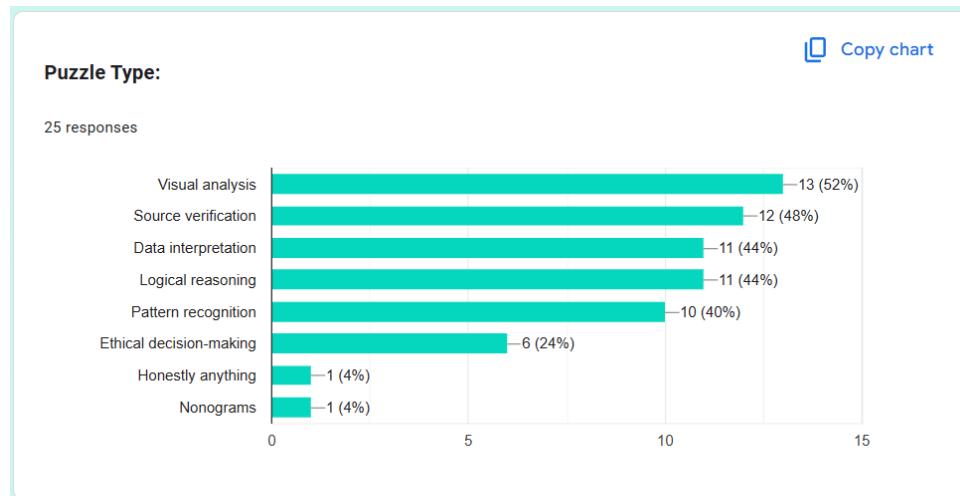


Figure 32. "Create your puzzle" responses in Google form – Puzzle type

In the last segment of the questionnaire, participants were asked to create a simple concept of the puzzle, by choosing media literacy skill which will be the main focus of the puzzle (Figure 31), puzzle type (Figure 32) and difficulty level (Figure 33).

Created puzzle ideas involve spotting fake news, analyzing social media, solving logic tasks, or piecing together clues. Challenges escalate in difficulty and often tie into the game's narrative or setting, making learning both fun and thematic.

Regarding the learning objectives of the created puzzles, the main goal in many suggestions was to teach players how to identify misinformation using critical thinking, fact-checking, and media analysis. Skills gained include source verification, pattern recognition, and understanding manipulation tactics.

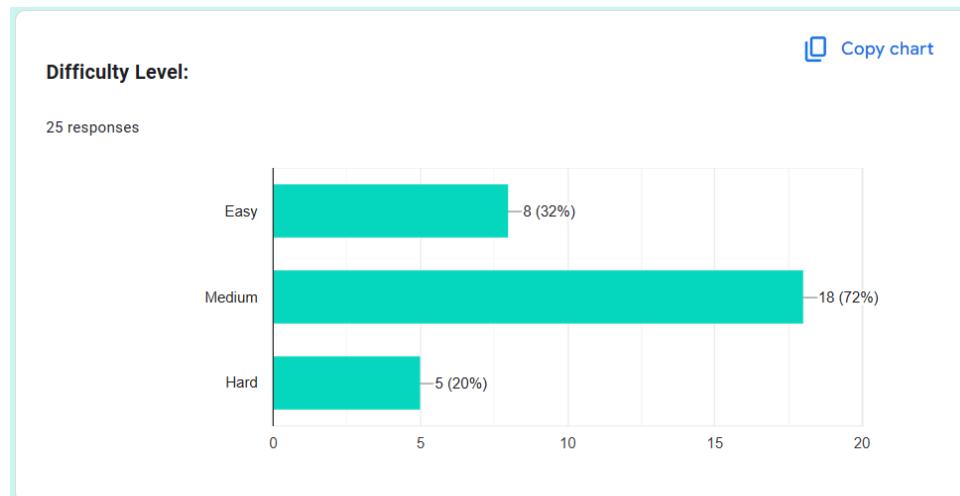


Figure 33. "Create your puzzle" responses in Google form – Difficulty level

At the end we concluded the webinar by outlining the following steps that should be performed, such as development of room prototypes, piloting and testing, and follow-up invitation for those interested in contributing to storyboarding or testing.

## Summary of Workshop Findings

The co-design workshop followed a multi-method approach to support ideation, empathy, and creativity in the development of educational escape rooms. Participants engaged in group activities to explore what young media users “see, feel, think, and do” when confronted with suspicious or misleading content online. In breakout sessions, they collaboratively proposed real-life settings for escape rooms, defined the central mission players must accomplish, and outlined possible puzzle sequences by mapping specific media literacy skills to game mechanics. Design concepts were then ranked according to three key criteria: engagement, feasibility, and educational value. The most promising ideas were refined in plenary discussion, balancing narrative freedom with pedagogical structure to ensure focus and adaptability.

Participant feedback, gathered through surveys and open discussions, emphasized several recurring themes. The co-design process was perceived as fun, collaborative, and informative. Many participants, including youth, reported learning new perspectives on disinformation throughout the session. A strong preference emerged for realistic scenarios that felt grounded in everyday digital experiences and avoided abstract or moralizing tones. Neutral missions framed around investigation, teamwork, or digital problem-solving were preferred over those suggesting the pursuit of “truth.”

There was significant interest in puzzle variety, particularly tasks involving logic, visual analysis, sound, and decryption. Participants highlighted the importance of puzzles that accommodate different player strengths and offer collaborative problem-solving opportunities. The most preferred character roles included journalists, students, and digital investigators. Participants also expressed support for a progressive challenge structure, beginning with basic recognition tasks and culminating in synthesis or verification-based decisions.

Visual inclusion and accessibility were consistently mentioned, including suggestions on color contrast, text readability, gender balance in character design, and overall interface clarity. Both individual and group gameplay modes were seen as valuable for maximizing accessibility and engagement.

The workshop directly influenced key design aspects of the escape rooms: narrative structure, puzzle logic, character roles, and learning flow. Realistic, politically neutral storylines such as investigative journalism, cyber breaches, and viral media analysis were consistently favored. Participants also called for media formats to be multimodal and interactive, avoiding passive quizzes in favor of tactile, sensory, or interpretive puzzles. The input gathered validates the project’s educational framework and has been instrumental in shaping the first iterations of the escape room designs.

Participants also emphasized the importance of user interface simplicity and intuitive interaction design to support immersion and reduce cognitive overload. Several groups noted that visuals and audio elements should avoid over-complexity, especially in early puzzles, and that onboarding or tutorial mechanisms could improve player orientation. In addition, youth participants expressed enthusiasm for time-bound challenges and “search-and-discover” mechanics that mirror real-world digital behavior, such as scanning feeds, tracing posts, or identifying patterns across multiple content sources.

Finally, many participants stressed that the escape rooms should help players not only detect manipulation but also reflect on their own media behavior and the broader consequences of disinformation—bridging the gap between knowledge and action.

## DESIGN GUIDELINES

This section provides a comprehensive set of design recommendations and considerations to support the development of the educational escape rooms. It outlines the pedagogical principles that will guide the learning experience, describes approaches for narrative and scenario development, presents an overview of the three escape room themes, and offers a reusable narrative framework template. It also addresses key aspects of accessibility, visual and thematic inclusivity, puzzle and interaction design, and cultural adaptability. Finally, the section will provide guidance for the technical implementation of ER and outline the alignment of the escape rooms with accompanying teaching materials. Two example escape rooms are provided at the end of this section to serve as inspiration and practical reference points for educators, and developers in creating their own media literacy-focused escape rooms.

**Pedagogical Design Principles.** The design of the educational ERs should be guided by well-established principles of experiential learning. Learning-by-doing is central to this approach, where participants acquire critical media literacy skills through solving problems, uncovering clues, and making decisions in time-constrained, immersive scenarios. Each ER should emphasize motivation by presenting learners with meaningful, real-life inspired challenges that reflect the urgency and complexity of today's media environment. The time-sensitive nature of the games will encourage active engagement and team-based problem solving, fostering both individual reflection and group discussion. The puzzles should be intentionally designed to scaffold key media literacy concepts, such as identifying misleading information and questioning the reliability of sources.

**Narrative & Scenario Development.** The narrative elements of the ERs have to be crafted to be both relatable and culturally grounded, drawing on regional disinformation themes identified through WP2 workshops. Rather than portraying players as defenders of "truth," scenarios should be framed around investigation, digital forensics, and collaborative analysis. Each storyline should incorporate real-world challenges familiar to young audiences, such as viral content, visual manipulation, and privacy issues. The use of fiction will allow learners to explore the mechanics of disinformation without politicization, while still promoting critical engagement with media content.

**Overview of the Three Thematic ERs.** The three escape rooms will be thematically aligned with the project's key media literacy objectives. The first escape room will focus on identifying disinformation and manipulated visuals, and should challenge players to assess the credibility of headlines, analyze visual content, and detect signs of media manipulation. The second room will center on detecting and guarding against AI-generated content, including deepfakes and synthetic media, where players will examine video footage, metadata, and behavioral cues to determine authenticity. The third escape room will address the topic of personal data collection on social media, guiding players through the exploration of data trails, algorithmic targeting, and the ethical implications of sharing personal information online. Together, these rooms will cover a spectrum of competencies related to digital literacy, critical analysis, and information responsibility.

**Narrative Framework Template.** Each escape room should follow a consistent narrative framework with a defined setting, central conflict, player roles, progression structure, and resolution. The setting may be a newsroom, social media monitoring center, or investigative lab. The conflict involves an emerging or ongoing disinformation operation that threatens to influence public perception or digital behavior. Players act as digital investigators, analysts, or researchers tasked with tracing and neutralizing these manipulations. The gameplay unfolds in progressive stages, with puzzles unlocking subsequent content and narrative twists. The resolution of each

escape room reflects the players' success in identifying, analyzing, and mitigating the threat, reinforcing key learning outcomes.

**Accessibility Considerations.** Workshop participants emphasized accessibility—particularly in user interface design—as essential for learner engagement. The user interface should be designed with universal accessibility in mind: high-contrast visual themes for low-vision users, text alternatives for all visual/audio content, keyboard navigation and screen reader compatibility, adjustable difficulty levels, and multimodal instructions (text, icon, audio). This will ensure inclusive learning for users with diverse abilities and learning preferences. Participants specifically requested thoughtful onboarding and pacing to support users unfamiliar with game-based environments.

**Visual and Thematic Inclusivity.** Visual and narrative elements should be designed to reflect diverse cultural, social, and gender identities. Characters, settings, and language should be inclusive, avoiding stereotypes or normative assumptions. Customizable avatars, neutral naming, and regionally inspired visual assets should enhance relatability across contexts. Scenes should be created with care to ensure learners from various backgrounds feel represented and engaged. Participants highlighted the importance of recognizing diverse perspectives and ensuring visual inclusivity to reflect the plurality of European youth.

**Puzzle and Interaction Design.** Puzzles should be developed to reflect core media literacy skills through interactive, problem-based tasks. Suitable puzzle types include image verification (spotting altered visuals), headline credibility analysis, source triangulation, and metadata forensics. Logic-based puzzles, timeline reconstructions, and sequence-matching tasks are also highly recommended. Players should engage with puzzles using a variety of interaction types, including drag-and-drop interfaces, multimedia analysis, pattern recognition, and timed decision-making. Puzzle difficulty should progress gradually, supporting learning through iteration and collaboration. Each puzzle should be embedded in the narrative and will contribute directly to the unfolding of the story, reinforcing both engagement and learning.

**Multilingual & Cultural Adaptability.** To ensure broad applicability across Europe and beyond, the escape rooms should be designed with multilingual and cultural adaptability in mind. All content should be externalized using JSON files, allowing for efficient translation and regional customization. Cultural references should be generalized or localized appropriately based on the deployment context, avoiding culturally specific idioms, humor, or references that may not be universally understood. The modular puzzle architecture will support easy substitution of content, ensuring that the core mechanics remain stable while the thematic content can be adapted for local relevance.

**Technical Recommendations.** Escape rooms should be developed as 2D or 3D environments using modular and scalable architecture. Each puzzle should be built as a reusable prefab, enabling efficient development and customization. Game configuration should be managed via JSON files that define puzzle logic, text content, localization, and others. This architecture will support both online and offline deployments, session saving, and future content expansion. Developers will be encouraged to follow the existing prefab-template structure and implement API call wrappers for portability.

**Teaching Materials Alignment.** Each escape room should be supported by a set of pedagogical materials designed to scaffold learning before, during, and after gameplay. Pre-game materials have to include media literacy backgrounders, vocabulary guides, and introductory scenarios to prepare learners for the themes of the game. In-game support should include tooltips, help menus, and facilitator instructions for educators. Post-game resources have to feature reflection questions, group discussion prompts, and worksheets to reinforce key

takeaways. These materials will be designed for integration into formal curricula and informal workshops alike, ensuring continuity between gameplay and broader educational objectives.

## Examples

To complement the design guidelines outlined above, the following two examples were developed based on the findings from the literature review, the outcomes of the participatory design workshops, and the thematic focus areas of the project. These examples illustrate how narrative, puzzle mechanics, and learning goals can be integrated into a cohesive escape room experience. They are intended to serve as inspiration and practical reference points for educators, developers, and facilitators creating their own media literacy-focused escape rooms.

### Example 1. ER Narrative: “Breaking the Fake”

#### Synopsis

You're part of a **Digital Forensics Team** within *SignalPoint*, an independent investigative network dedicated to digital media integrity. A whistleblower has provided a set of sensitive documents exposing a coordinated effort to manipulate public discourse ahead of a major international event. But just before your team could examine the evidence, SignalPoint's newsroom systems were hacked. The files were encrypted and scattered across digital storage archives — behind a wall of puzzles and hidden clues. To prevent the spread of misleading narratives and data misuse, your team must act fast. Time is running out — if you don't analyze the digital trail and secure the evidence within 45 minutes, this influence operation could spiral out of control.

#### Game Flow & Puzzles

**Setting:** A virtual newsroom filled with interactive stations — including fact-checking dashboards, media forensics terminals, AI analysis tools, and a social media monitoring desk.

##### Puzzle 1: Headline Analyzer

Scenario	Mechanics	Learning Goal
A terminal displays several news headlines and article snippets. Some are authentic; others are misleading, exaggerated, or based on faulty data.	Players cross-check each headline using an in-game fact-checking tool and a digital verification archive. They must identify markers such as clickbait language, vague sources, and tampered statistics.	Learn to critically evaluate news content for credibility and identify common patterns of manipulated or misleading media.

##### Puzzle 2: Image Investigation

Scenario	Mechanics	Learning Goal
Players receive a viral image circulating online	Using a reverse image search and metadata inspection tools, players	Understand how visuals can be repurposed or

that supposedly shows a crisis event.	determine the original context, location, and date of the image.	misrepresented to deceive, and how tools like reverse search help verify content origin.
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**Puzzle 3: Video Verifier**

Scenario	Mechanics	Learning Goal
A video of a public figure making a controversial statement is going viral. Players must assess its authenticity..	Players inspect the video for deep fake signatures — glitches, mismatched audio, or timing inconsistencies — using a deepfake detector tool embedded in the game.	Develop skills to spot AI-generated content and recognize indicators of deepfake manipulation.

**Puzzle 4: Data Exposure Tracker**

Scenario	Mechanics	Learning Goal
Players uncover a set of social media profiles spreading misleading content. The profiles also reveal unexpected levels of personal detail and targeted engagement.	Players review a simulated social media dashboard, identifying what personal data is visible, what data has been exploited (e.g., location, preferences), and signs of automated or inauthentic behavior. They then match digital behavior patterns to possible privacy breaches.	Raise awareness of <b>how much personal data is shared online</b> , Understand how that data can be <b>used to tailor misinformation</b> , and Reflect on the <b>rights and responsibilities</b> when engaging with digital platforms.

**Final Challenge: Verify & Secure the Leak**

Scenario	Mechanics	Learning Goal
Once all puzzles are completed, players must piece together the whistleblower's document by selecting valid sources, discarding misleading ones, and assembling the message in the correct order.	Drag-and-drop interface to organize documents, images, and statements into a clean report for internal review.	Consolidate critical evaluation skills by separating credible evidence from manipulated or irrelevant content.

## Victory Conditions &amp; Endings

Outcome	Narrative Result
Success	The disinformation campaign is disrupted. The investigative team safely reconstructs the whistleblower file, raising internal alerts across media networks.
Partial Success	Some manipulated content is filtered, but not all key evidence is recovered. The campaign is delayed, but not stopped. The team identifies points for follow-up investigation.
Failure	The influence operation spreads unchecked. Misleading narratives gain traction online, eroding trust and leading to social or institutional consequences.

## Example 2: Operation: Factcheck — Race Against Disinformation

## General Storyline

You are part of a newly formed Digital Intelligence Team working with an independent investigative network. A critical alert has come in: an anonymous group is preparing to unleash a surge of coordinated disinformation designed to manipulate public perception during an upcoming major event. If left unchecked, this campaign could spread rapidly — distorting facts, influencing decisions, and overwhelming reliable sources.

## Mission

- **Analyze suspicious content, decode hidden messages, and stop the spread before the "Disinfo Surge" countdown reaches zero.** Stay focused — the information landscape is more complex than it seems.
- **Decipher secret messages, expose manipulated visuals, and stop** the "Disinfo Surge" before it "explodes"—symbolically spreading irreversible misinformation across social media platforms!

Teacher's Intro Text: "*Welcome, digital investigators! The Archive Room has been breached — misleading documents and manipulated visuals are scattered everywhere. Your task is to analyze the evidence, crack encrypted clues, and prevent a dangerous misinformation device from going live. Work as a team, think critically, and remember: some things are designed to mislead you. Be observant. Be curious. And stay alert — the timer has started!*"

## Escape Room Structure

ER game consists of four rooms: The Archive Room, The Photo Lab, the newsroom and Info-Bomb Room.

## 1. The Archive Room

Setting	Puzzles	Learning Element
A cluttered archive filled with old newspapers, microfilms, and coded telegrams.	<b>Cipher Puzzle:</b> Players find an encrypted message (Caesar Cipher or simple substitution cipher). Decoding it gives a series of numbers. <b>Number Lock Puzzle:</b>	Recognizing how misinformation can be "hidden" or coded within seemingly innocent information.

	<p>Use the numbers from the decoded cipher to open a physical or virtual 4-digit number lock attached to a locked drawer.</p>	(Also practicing basic codebreaking and careful attention to detail.)
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## 2. The Photo Lab

Setting	Puzzles	Learning Element
A room with image editing computers, printers, and forensic tools	<p><b>Spot-the-difference challenge:</b> Identify which images have been <b>digitally manipulated</b> (deepfakes, photoshopped items, false context).</p> <p><b>Safebox Puzzle:</b> Each correct identification of a manipulated image reveals part of a code. After identifying 3–4 manipulated visuals correctly, players assemble the code to unlock the <b>safebox</b>.</p> <p><b>True/False Fake News Board:</b> Players are shown <b>short headlines</b> and must classify them correctly as <b>true</b> or <b>false</b>. Each correct classification reveals part of a final phrase or keyword..</p>	Strengthening critical evaluation of visual and textual information; understanding that misinformation can come both visually and textually

## 3. The Newsroom

Setting	Puzzles	Learning Element
A bustling, semi-chaotic newsroom with half-written articles, radios playing various stations, bulletin boards with notes..	<p><b>Radio Puzzle:</b> Tuning the radio to correct frequencies (based on hints scattered around the room) reveals snippets of real vs. fake news stories. Players must <b>listen carefully</b>, spot inconsistencies, and write down keywords.</p> <p><b>Secondary Clue:</b> Keywords gathered will hint at the right final location in the room (e.g., a file cabinet or under a desk) where the next clue is hidden.</p>	Highlighting how audio/media channels are used to spread (or prevent) misinformation, and the importance of verifying news sources

## 4. The Info-Bomb Room

Setting	Puzzles	Learning Element
A digital "server room" where a symbolic "info-bomb" device is connected to a network hub.	<p><b>Bomb Puzzle:</b> Players must defuse the "info-bomb" by:</p> <ul style="list-style-type: none"> <li>• <b>Cutting the right wires</b> (based on color/keyword associations learned earlier).</li> </ul>	Fast, informed decision-making based on validated information, symbolizing real-world fact-checking urgencys

	<ul style="list-style-type: none"><li>• <b>Pressing buttons</b> in a sequence (based on the order of true stories identified in the True/False challenge).</li><li>• <b>Adjusting a slider</b> to match a "fact-to-fiction" balance found in previous puzzles.</li></ul>	
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## Victory Conditions & Endings

Ending Type	Description
<b>Success Ending</b>	Players successfully solve all puzzles, identify the correct disinformation patterns, and defuse the bomb before the timer runs out. The misinformation is contained, and the newsroom is saved. They are praised as digital heroes.
<b>Partial Success</b>	Players solve most puzzles but miss a few fake/true identifications. The bomb is defused, but some disinformation still leaks out. They're warned: "Victory, but lessons must be learned!"
<b>Failure Ending</b>	Players fail to disarm the misinformation bomb (run out of time or incorrect final wire cut). Misinformation spreads, causing chaos. Fade-out with sound effect of emergency sirens and flashing "Mission Failed" screen.

By playing this ER, participants can practice critical thinking, cross-referencing, and fact-checking. They are pointed to understand common signs of manipulated visuals and fake news. Also, it is recommended to stay neutral and avoid political bias — focus should be purely on disinformation techniques and how to detect them.

## CONCLUSIONS

The design guidelines outlined here emerged from a rich participatory process involving youth, educators, and media professionals across Europe. Through workshops and collaborative design sessions, a shared vision was developed for educational ERs that are not only pedagogically sound but also engaging, adaptable, and inclusive.

These guidelines will serve as a foundation for the technical development, narrative scripting, and pilot testing of the ERs. As the project progresses into the implementation and evaluation phases, they will continue to guide iteration, localization, and alignment with the project's overarching goal: equipping young people with the media literacy skills they need to navigate the complex digital world responsibly and critically.

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## APPENDIX A

Wrap-Up session Google Form answers provided by workshop participants for following questions:

### Theme selection – Why is this theme particularly relevant?

1. It is easy to take a truth and spin it around to make a lie that suits your need for spreading a certain message
2. AI has become one of the main ways to make believable misinformation.
3. I think its unique for the genre in general.
4. Because its otherwise pretty factual, and can teach us some useful info
5. Education in recognizing AI generated content is needed in settings that people don't anticipate to encounter it.
6. AI things are trending a lot.
7. It exploits emotions, identity, and biases
8. Disinformation can threaten democracy, enable those who control the media (usually the government) to create a distorted image of the opponent (the opposing political party).
9. High criticality
10. It's probably the most dangerous of them? All of them are relevant though
11. Deepfake fraud is an issue on social media now, and good that the youth can be prepared by the game about the manipulative messages.
12. Because we hear a lot of fake informations and its important that people know what is real and what is not
13. We can develop a storyline based on AI promoting disinformation and talk about all the topics
14. Because of the current state of Serbia
15. I think its transversal to everything else. Become used to spot weird things through intuition
16. because of the current state of the world
17. Health is the most important things. Misinformation related to health and science may spread faster.
18. It would affect everybody
19. It serves as a social weapon and has an influence on the other topics as every of the other topics can turn political
20. Because of the current state in my country (Serbia)
21. I think each theme has its own relevancy but people should be more educated about corruption and misinformations regarding their own country and so on
22. AI is everywhere
23. Health and science are very important and recently a lot of facts are questioned and obvious fake stuff is accepted
24. Because it is important to rightly inform others about scientific research
25. It is global and current subject.

### Setting & Environment – Shortly describe the chosen environment:

1. It is a building where people work at to create false information to spread propaganda that suits them for whatever reason(money, power, just want chaos etc.)
2. A government office in the late hours when everyone has gone home.
3. U can fast travel via public transport and if u dont u can gather more info from the ppl innit

4. On a more general level, I believe this could be a great idea for escaping several "rooms" to escape the dystopian society our protagonist is in
5. Acting as the agent of change, maybe some espionage-related themes.
6. High contrast colors, red and white color.
7. Newsroom is where information gets checked, verified, and published. Social Media as People especially young people read news, scroll social media and perfect spot for misinformation sharing
8. A part of the media headquarter consisting of several connected rooms where puzzles are solved in certain rooms and an entrance or an element used in another room is enabled.
9. Newsroom/Media organization, Social media company headquarters
10. All of them are equally good
11. basement of the top social media companies
12. Its giving scary and horor
13. An Journalist Influencer that uses AI to gain followers and employs different techniques
14. The office at night, light of street lights coming through the windows, a lot of papers on desks, computers
15. room with screens and phones
16. A bustling newsroom filled with desks, computers, and stacks of urgent reports, or a high-security government office lined with filing cabinets, restricted access doors, and official documents. i feel like it would fit the theme
17. This environment is interesting. It can keep students' motivation.
18. a bif university in which teens and your adults could be identified
19. Evetning happens trough the device screen and social media platforms
20. It would be fun to see public settings incorporated in this theme. Also, I think government office would be fitting environment for the theme I picked.
21. Investigating documents, interviewing people in transport
22. I like it
23. An empty train that isn't moving, find a way to escape
24. A dark laboratory in which scientists research different chemicals
25. School gives many possibilities: classrooms, principle room, kitchen, hall, bathrooms, yard...

### Character Roles – Backstory for chosen character:

1. They are a person that realized that the best way too fight this problem is to strike at the root of the problem and stop people that create it
2. Since the character is trying to escape from a government building it would be most likely that the player is a government official. A simple story for the character would be that they found out some misinformation that was intentionally put out in the news by a colleague that works in the same government branch, and our character is trying to expose their scheme.
3. Empty, purpose missing student that is descovering himself at the same story as the story goes.
4. A person who has realised what is going on around them and been exposed to the dark secrets of the society around them
5. Completely related to what the overall story is, the player's role should be interesting and not the most obvious choice.
6. Trainee for a company or a temporary recruit.
7. journalist Investigate and detect false claims. Students exposed to misinformation in class and during research. Social media managers' brand or organization is involved in misinformation

8. The young journalist or fact-checker has been given a challenge that he must solve because all the other journalists in the team are actually corrupt and cannot be counted on.
9. Time travelers that need to amend the damage cause by misinformation in the past
10. An investigator who uncovers clues about a conspiracy and sets out to uncover it a cat detective who investigates human behavior would be cute and interesting
11. He heard about an abandoned hospital in his town where everyone goes missing if they don't finish the escape game, so he decided to go and do it himself
12. Same as before
13. Journalism student wants to figure out the truth of the huge incident in which their friend died that the government wanted to cover up
14. Someone evil but not smart (can fool dumb people but not smart people)
15. a group of journalism/students uncover a
16. unpublished report hinting at a government cover-up while interning at a major newsroom. Following the clues, they have to solve puzzles and uncover the truth before time runs out.
17. Students and journalists collaborate together to find the clues from books, newspapers or somewhere. Social media managers try to organize clues. Three groups work on revealing the conspiracy and reporting the truth to the public.
18. a computer science student
19. I don't know, maybe you're in a situation where you need to check some news about a relevant topic or something like that
20. Students and journalists fighting for justice in secret
21. people looking for truth
22. The journalist is an expert in misinformation
23. Just a regular citizen trying to find out the truth and spread it to other people
24. A person who stumbled across the lab when nobody else was around
25. There are big rumours about the climate and for example soda drinks. (Idk. My brain is frozen.)

### Game Objective – What if players succeed:

1. The truth is revealed and the people see it around the world
2. They get recognition for their work.
3. Something that makes him find the purpose he was looking for the whole adventure
4. The world prospers
5. The police can take action.
6. They learn new insight to help solve tougher cases
7. achieve goals.
8. no fake news are spreader and player take all HDs with manipulative data before it is destroyed by the bomb
9. Humanity is saved
10. They manage to save the elections
11. win special digital badge
12. He gets a reward
13. Show some reflection
14. The truth gets revealed, the responsible people for the tragedy get arrested and it brings people closure.
15. They convince others to believe their views
16. they expose the truth to the public and make headlines
17. Someone is not mislead by disinformation.
18. achieve recognition

19. I don't know
20. They get recognized and awarded for their hard work.
21. they get rewarded
22. They are shown the fake news do not spread
23. People learn to research topics that seem important to them
24. Successfully publish the right information
25. He/she will be the student of the year and the soda will be available for everybody again.

### Game Objective – What if players fail:

1. the situation only gets worse causing something bad to happen
2. They somehow get thrown into jail by the evil colleague.
3. that would be very sad :(
4. The regime rules indefinitely
5. The culprits escape.
6. They have to go back to solve easier cases before advancing forward
7. play again till they achieve the goals
8. bomb explodes and destroys all the evidence
9. Humanity collapses
10. A political shift to dystopic future
11. win special digital badge (i.e. as a winner of the fake news sid
12. He will get a new chance
13. Show the possible future consequences that disinformation may have in society
14. The character gets arrested on false claims and no one finds out the truth
15. They become ostracized
16. if they fail, the story is buried forever and their chance to make an impact is lost.
17. Someone trusts disinformation and does something wrong.
18. learning experience
19. Something happens showing up that the fake news were actually fake (narrative dissonance between the fake new and the reality of the game?)
20. It sends a strong message about society.
21. retry with different approach
22. They learn the importance of stopping viral fake news
23. People just accept everything they see, labeling people who do reasearch "googledebunkers"
24. People get hurt from trusting the misinformation
25. No soda, no fun.

### Create your puzzle – Short description:

1. The player goes around and collects evidence by finding the source of the truth and comparing it to the lies
2. Our character stays late at the office to find the source of misinformation.
3. Puzzles should be for the time fixing part and for the players mental state as well i think
4. A mini-game in which one must e.g. apply the correct order of steps in solving a scientific equation.
5. Solving the puzzle reveals an image that contains a hint for the next step.
6. Spot fake AI images in a photo art exhibition in gallery.
7. review a set of social media posts and decide which ones are misleading or fake
8. The player must identify all the fake news in order to defuse the bomb
9. A set of time travelers needs to amend the damage caused by misinformation in the past in order to save humanity

10. Something to induce critical evaluation of media
11. for example, an extra puzzle that you need to find out by solving all basics in certain time, would be interesting
12. U have to find the right objects to go to next levels so u can free the town of missing persons
13. -
14. The character has time until dawn to figure out what happened
15. Have different levels of completion for each puzzle/task. Think games with starts. 1 star is easy, 3 is hard
16. players have to verify sources, cross-check facts, and identify misinformation to uncover the truth
17. Players could find the clues from different places of the escape room, and find the codes by identifying the true images or texts of social media(maybe could design a mobile interface to display social media data).
18. a
19. Fake news reach you through your device and you start investigating
20. Player has to do puzzles that have to include some logical reasoning or some pattern recognition.
21. puzzles get more difficult after each stage
22. check that a piece of fake news is misinformation using web search
23. You have to find proof that an archeological site is fake
24. A player must go through all given documents and try and connect the real product of research
25. The student will learn cause and effects of climate changing

### Create your puzzle – Learning Objective:

1. Not to believe everything at face value and learn how to fact check information you come across
2. The learning objective would be education on how to identify misinformation and fake news.
3. Fast information gathering and emotional growth
4. I can imagine this being useful in the sense of us having to search for information inside the game itself to solve the puzzle therefore problem-solving skills and improvisation
5. Learn to use new methods and logical thinking.
6. To understand that AI photos can be convincing, but they have issues with shadows or how things are built, ie. car engines or lightposts looking wonky.
7. critical thinking and media literacy
8. identification of fake news and identification of a false source
9. Raise awareness about misinformation in the media, recognize fake news
10. Critical thinking improvement
11. improve the reasoning skill based on the given info/ achievement
12. How to save people
13. Develop critical thinking and improve media skills
14. To better recognize fake news
15. Learn to recognize in your body/emotions when you should look deeper into the information you are being given
16. to develop critical thinking and media literacy skills by practicing source verification and understanding the importance of trustworthy journalism
17. Help students to better use social media and identify disinformation.
18. a
19. identify media manipulation depending on language usage

20. The objective is that player understands importance of understanding media and operating numerous softwares and devices.
21. ?
22. learn to check misinformation
23. Teaching people that not every conspiracy theory is real
24. Problem solving skills
25. Learning and understanding Climate responsible action and sustainable development