CONSCIOUS YOUTH BEHAVIOURS IN EMERGING REALITIES

Non-formal education practices:

Morphing & Deepfakes

R2 CYBER TOOLKIT

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#13	**Mastering the Digital Enigma: Counteracting Morphing & Deepfake Phenomena**
Threat(s)	**Morphing & Deepfakes**
	Morphing involves the manipulation of digital images using online tools, allowing perpetrators, often targeting young girls and women, to alter photographs posted online for nefarious purposes. These altered images can be exploited for blackmail, creating deceptive online profiles, sexting, engaging in illicit sex chats, and generating pornographic content. Morphing attacks may involve the use of image editing software to combine biometric passport photos, producing an image that misleadingly represents a composite of two individuals. Similarly, deepfakes represent a sophisticated form of digital manipulation, where someone's likeness in an image or video is replaced with another's, crafting highly realistic yet entirely fabricated content. Deepfakes carry significant risks within the sphere of youth cyber-threats, as they contribute to the spread of misinformation, manipulate perceptions, and facilitate cyberbullying, thereby amplifying the potential for harm and exploitation in the digital realm.
Typology	Critical analysis of online content
Duration	120 minutes/2 hours (can be adjusted based on depth of activities)
Modality	In-presence [classroom setting]
Aim	The aim of this practice is to equip participants with the skills and knowledge to critically assess digital images and videos, apply ethical judgments when dealing with morphed or deepfake content, exhibit responsible online behaviour and protect their personal digital identity.
Learning Objectives	Critically Assess Digital Images: Participants will be able to critically examine digital images for signs of manipulation, applying their understanding of morphing techniques. Apply Ethical Judgments: Participants will demonstrate the ability to apply ethical judgments when creating, sharing, or encountering morphed images, recognizing the potential harm and respecting individuals' rights. Demonstrate Responsible Online Behaviour: Participants will exhibit responsible online behaviour by respecting privacy, seeking consent before sharing images, and discouraging the dissemination of false information through morphed images. Protect Personal Digital Identity: Participants will implement effective strategies to protect personal images and information online, such as using strong privacy settings, watermarking personal photos, and being cautious about sharing images on social media.
Trainee profile	Age Group: 15-17 years old Educational Background: High school students Prerequisites: Basic understanding of internet use and social media platforms

n° participants	15-20 (ideal for facilitating group discussions and activities)
Materials	Internet-connected devices (laptops/tablets) Projector and screen for presentations Whiteboard and markers Printed handouts with examples of morphed and deepfake images/videos Fact-checking guides and resources Notebooks and pens for participants
Preparation	Set Up Venue: Arrange the classroom seating in a way that facilitates group discussions and easy viewing of the projector screen. Prepare Materials: Ensure all digital devices are connected to the internet and preload relevant websites and examples. Print handouts and ensure all materials are available.
Implementation	*Introduction (10 minutes):* Welcome participants and introduce the topic. Briefly explain the threats posed by morphing and deepfakes. Outline the session objectives and structure (optional). *Interactive Presentation (30 minutes):* Present examples of morphed and deepfake content. Examples have been given in Annex_. Discuss the techniques used in creating such content. Highlight real-world implications and ethical considerations. *Group Activity: Critical Analysis (30 minutes):* Divide participants into small groups (3-4 individuals). Provide each group with a set of digital images and videos. There are numerous available online. Ask groups to identify signs of manipulation and discuss their findings. *Ethical Judgments and Responsible Behaviour (20 minutes):* Facilitate a group discussion on the ethical implications of morphing and deepfakes. Encourage participants to share their thoughts on responsible online behaviour

	Present real-life cases where morphing and deepfakes caused harm. *Personal Digital Identity Protection (20 minutes):* Share strategies for protecting personal images and information online. Demonstrate how to use privacy settings and watermarking tools. Discuss best practices for sharing images on social media. *Q&A and Wrap-up (10 minutes):* Open the floor for questions and answers. Summarize key takeaways from the session. Provide additional resources for further learning (optional).
Tips and hints	Encourage active participation by asking open-ended questions and prompting discussions. Use visual aids effectively to illustrate points and keep participants engaged. Use a variety of examples, including both simple and complex cases of morphing and deepfakes, to cater to different levels of understanding.
Safety measures	Ensure internet safety during online activities. Create a respectful and non-judgmental space for discussions.
Added value	Participants will gain the ability to identify manipulated content, understand the ethical implications of creating and sharing manipulated content, leading to more responsible online behaviour and reducing the risk of misuse and enhancing their online privacy, and develop critical thinking.
Feedback and Evaluation	Encourage participants to provide feedback at the end of the session to improve future practices.
Conclusion	This practice effectively addresses the growing threats posed by morphing and deepfakes by providing participants with essential skills and knowledge. The practice not only enhances digital literacy but also promotes responsible behaviour and critical thinking, aligning perfectly with the stated objectives. Participants leave with a heightened awareness of digital manipulation and the tools to combat it, making this practice highly relevant and impactful in today's digital age.

Annex. Printout of Popular Morphing and Deepfake examples

Popular Morphing Example
FaceApp and Snapchat Filters: These popular apps allow users to swap faces with celebrities or other individuals. Users can take a photo and use the app's tools to overlay a celebrity's face onto their own, creating amusing or uncanny images. For example, people often morph their faces with actors like Leo-

nardo DiCaprio or singers like Beyoncé to see what they would look like as famous personalities.

Popular Deepfake Examples

The Mandalorian (Star Wars Series): The character of Luke Skywalker, as he appeared in the 1980s, was recreated using deepfake technology in the Star Wars series "The Mandalorian." This allowed the character to appear much younger than the actor's current age.

Figure 1: The Mandalorian (Star Wars Series): The character of Luke Skywalker Deepfake (Source: https://nypost.com/2022/02/03/fans-suspect-youtuber-behind-awesome-book-of-boba-fett-cgi/)

Mark Zuckerberg Deepfake: A video of Facebook CEO Mark Zuckerberg where he seemingly discussed controlling billions of people's stolen data. This deepfake was created as an art project to highlight privacy concerns and the potential misuse of deepfake technology.

Annex. Techniques Used in Creating Morphing & Deepfake Content

During the interactive presentation segment, the facilitator should cover the following techniques used in creating morphed and deepfake content:
Image Morphing: **Manual Editing:** Using software like Adobe Photoshop to manually alter images by blending features from multiple photos. This includes techniques like layering, masking, and blending modes. **Face Swapping:** Utilizing face-swapping tools and apps that automatically replace one person's face with another's in a photo or video. **AI-Powered Tools:** Employing AI tools that can morph faces by understanding facial structures and making realistic adjustments.

Deepfake Creation: **Generative Adversarial Networks (GANs):** Understanding how GANs work, with one neural network generating fake images and another trying to detect them, refining the fakes over time. **Autoencoders:** Using autoencoders, which are neural networks trained to compress images and then reconstruct them, to alter faces in videos by mapping them to a different face. **Deep Learning Algorithms:** Applying deep learning algorithms to create highly realistic fake videos by training on large datasets of images and videos of the target person. **Voice Synthesis:** Utilizing text-to-speech technologies and deep learning models to clone a person's voice, making the deepfake even more convincing by synchronizing the voice with the video.
Video Editing: **Frame-by-Frame Editing:** Manually editing video frames to change appearances or actions, which is time-consuming but can produce very detailed manipulations. **Motion Tracking:** Using software to track and manipulate the movement of features in a video, ensuring that changes look natural as the subject moves. **Lip Syncing:** Employing lip-syncing technologies to match the mouth movements of a person in the video with a different audio track, often used in conjunction with voice synthesis.

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