

VISUALISING SCIENCE: CRAFTING MEMES IN DESIGN PEDAGOGY

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Abstract. This paper details and analyses the methods and outcomes of nine pedagogical workshops in design courses at Portuguese universities, centered on the unlikely mix of online memes and scientific knowledge. The workshops took place between March and July 2023, were conducted within the exploratory project 'Sci-Bi: An Infodemic of Disorientation: Communication Design as a Mediator Between Scientific Knowledge and Cognitive Bias.' The project posits that communication design may play a role in translating and visualizing scientific information in clear, accessible, and engaging manners. An example of this is evident in the creative outputs produced by students, showcasing innovative ways to communicate scientific information. The output of these workshops consisted of infographics, reels, and memes, to be presented to the public for external validation in two forthcoming exhibitions in 2024.

Keywords: Scientific Memes, Communication Design, Pedagogical Workshops, Sci-Bi Project, Design Mediation.

1. Introduction

This paper delves into the intersection of online memes and scientific knowledge within design courses across Portuguese universities. The study, conducted between March and July 2023, is part of the 'Sci-Bi: An Infodemic of Disorientation' exploratory project.

This project proposes that communication design can bridge the gap between scientific complexity and accessibility. As noted by Franconeri et al. (2021), data visualization can play a decisive role in communication, as long as communicators adapt visualizations to the target audience. The primary hypothesis is that integrating design principles with scientific knowledge can enhance clarity and engagement. The study focuses on nine pedagogical workshops, where the fusion of online memes and scientific rigour is explored.

Beyond academic experimentation, the study addresses the societal need for innovative scientific communication (Granado, 2015). In an era dominated by information overload and misinformation, the paper argues that communication design within design courses can contribute to addressing health misinformation,

particularly on social media. As noted by Deveux (2023, 284) “internet memes have the potential to meaningfully and organically engage complex topics in the classroom, tap into the affective dimensions of learning, and mobilize as visual pedagogical spaces for critical literacies.”

The classroom is highlighted as an ideal setting to observe emerging communication dynamics among younger generations. Engaging students in creating scientific communication tools and narratives not only explores new ways of disseminating knowledge but also empowers students to shape the discourse on scientific information. As noted by Lupton (2017,44) “speculative design projects amplify current social and technological developments. They often look ahead to reflect upon the present world”.

As the study concludes, the outputs in the form of infographics, reels, and memes represent tangible results of merging communication design with scientific rigour. Science communication brings proven advantages related to public awareness of science, public understanding of science, scientific culture and scientific literacy (Burns et al., 2003). These outputs are set for external validation through two exhibitions in 2024, showcasing the practical contributions of this interdisciplinary collaboration to evolving scientific engagement and communication in the digital age.

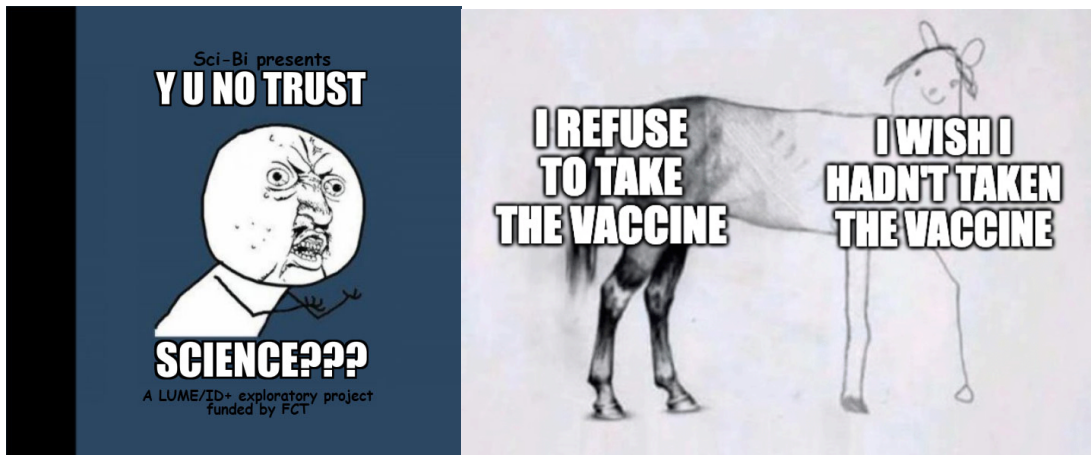


Fig. 1. and 2. Memes created in the context of the project Sci-Bi. Source: The authors, 2023.

2. From Research Project to Design Pedagogy

Conducting pedagogical exercises provided a tangible platform for researchers to apply and test the theories explored in the broader project (Scrivener, 2012), fostering a direct link between academic knowledge and practical skills. By engaging students in real-life design scenarios, the pedagogical exercises served as a laboratory for examining the role of communication design as a mediator between scientific knowledge and cognitive bias.

Our research team conducted these workshops with students from the following institutions: the University of Porto, Lusófona University, Leiria Polytechnic, Cávado e Ave Polytechnic, Aberta University and the Oporto Polytechnic. The outputs fell within three categories: infographics, reels and memes. Below are the proposed six themes for the workshops, followed by a detailed description of selected workshops from: Lusófona University, Leiria Polytechnic, Aberta University and the University of Porto.

3. Just Between Meme and You

The workshops, titled 'Just Between Meme and You,' offered six themes for exploration:

1. Meme Pandemic Advice: create a meme to encourage the use of masks, social distancing, or vaccination;

- 2. Memes Scientific Jargon: craft a meme that humorously mocks scientific jargon, making it more accessible for non-scientific audiences;
- 3. Meme Did You Know?: create a meme showcasing an interesting or surprising fact about the pandemic, spanning topics like pandemic history, vaccine science, or the economic impact of COVID-19;
- 4. Unexpected Memes: Each student generated an image and caption. The collected material was then combined randomly, followed by an interpretative debriefing of the results;
- 5. Meme Before, During, and After: to depict life before, during, and after the pandemic, creating a meme that contrasts these different phases;
- 6. My Biomeme: Participants were encouraged to craft a meme based on a personal experience during the pandemic, incorporating their own images.

The typology of the workshops varied. While one workshop taken place at the University of Porto concentrated on the production of infographics (Fig. 6), the majority centered on memes, with one workshop specifically dedicated to reels.



Fig. 3, 4, 5 - Memes from workshops with Aberta University, Lusófona University and Porto Polytechnic. **Source:** Authors, 2023

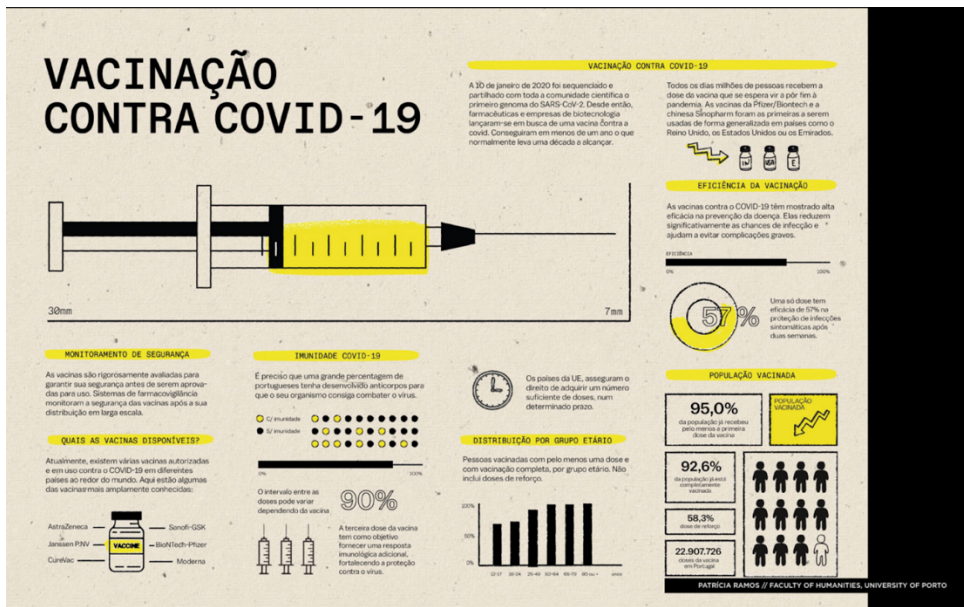


Fig. 6. Infographics about Covid vaccination. **Source:** authors, 2023.

The workshop at Lusófona University was integrated into the first-year curriculum of the Communication Design degree. The workshop had a total of 16 participants, two of whom were from the Erasmus program—one from France and another from the Czech Republic. Memes created in the workshop could take the form of

either static images or animated gifs, employing either existing images or those generated by the students themselves. While students had the freedom to choose any software, the use of tools specifically designed for meme creation, such as Meme Generator, was recommended.

Despite the proposal being presented in a class context, only 13 out of the 16 students completed it. In total, 29 meme proposals were collected. One hour of class time was dedicated to brainstorming ideas. Following reflection, each student reported potential ideas for the memes based on lived or observed experiences during the pandemic. Most students chose to work on "My Biomeme" and "Before, During, and After." Interestingly, no students opted for "Meme Pandemic Advice" and "Meme Did You Know That?" as the pandemic was initially perceived as a distant topic, generating little desire to remember.

When prompted to recall short episodes from their daily lives, the participants displayed enthusiasm and promptly shared amusing situations. These episodes were later incorporated into their memes. They also highlighted situations they found inconsistent, such as the restriction of leaving the house only for attending Mass. The project was finalised within a two-week period, with some fine-tuning made afterwards.

Additionally, the topics mentioned above in class covered several aspects, including references to the duration of the lockdown, comparisons between life before and during the pandemic online classes, the vaccine, weight gain observed in many confined individuals, and the fear of coughing in public due to its negative connotation.

The Reels workshops were conducted in a curricular design project, held at School of Arts and Design Caldas da Rainha - Polytechnic of Leiria, involving 2nd year students from the BA in Graphic & Multimedia Design. The number of reels produced was 19 produced by 38 students. Considering the curricular contents of the course, it was chosen to use a video-animated format with a strong presence and dissemination ability in social media, Which as noted by Mark Zuckerberg (Julien, J. 2022) Reels already account for 20% of the time people spend on Instagram.

“In Q2 2022 alone, the median interaction count for Reels was almost 40% higher versus traditional videos, according to Emplifi data. Reels are extremely flexible in how they can be shared among audiences, making them much more versatile than feed posts. Users can easily share Reels with friends via Stories, and discover Reels on the Explore page, as the Instagram algorithm continues to favor this content format over others. Since the start of 2022, Reels have become the most engaging post type on Instagram.” (Julien, J. 2022)

Students were organised in pairs and were invited to create Reels or Youtube Shorts for social media related to experiences lived or observed during the pandemic and/or post-pandemic period. Approaches could include the above mentioned 'Just Between Meme and You,.'.The reel, besides his short and teasing communication nature (average duration 15 seconds), was expected to embed type animation. The time dedicated to this practice was around 24 hours.



Fig. 7. Snapshot of reel. **Source:** authors, 2023.

In conclusion, students actively participated in the workshops, exploring various themes through creative techniques like satire, parody, and hyperbole. The collaborative nature of the workshops promoted community engagement, with students sharing experiences and creating memes that resonated with shared challenges and humor.

At the tail end of these workshops, and taking into account the somehow dislike from the students to go back to the Covid topic, a final workshop challenged the students to target conspiracy theories about covid and other health related issues. They did so recurring to infographics as they belonged to Communication Science Course, 1st year. The workshop was conducted with two researchers from the Sci-Bi project involving forty two students in a total of eighteen hours. From this workshop twenty infographies were produced.

The nine workshops were conducted with students from different university stages, from the BA, Master and PhD level, such as the PhD programme in Digital Media-Art of the Aberta University (Fig. 4).

The study employed a qualitative approach, emphasising the collaborative and hands-on nature of the research environment. Practical, hands-on experiences in the classroom were central to bridging the gap between academic knowledge and practical skills. The qualitative data collected through contextual analysis, feedback collection, and iterative processes contributed to an understanding of the possible impact of communication design on public perception and decision-making during the infodemic. All these levels of interaction between science and the general public contribute, not only to the dissemination of science but, as Correia argues (p.66), to transform it into a public good, accessible to all, and capable of serving the public.

4. Findings and Conclusions

The workshops featured a briefing but open-ended and intuitive participant engagement, with humour emerging as the most favoured approach. Participants generally expressed reluctance to dwell on memories of COVID, emphasising the importance of focusing on holistic health and potential future challenges. Responses varied from refusal to participate to a genuine commitment to exploring innovative forms of health communication. To grant unbiased freedom of expression, some of the workshops - such as the one conducted

by the Aberta University - provided an anonymous submission mechanism, so that potentially controversial points of view could still be represented.

Face-to-face interactions demonstrated a heightened inclination toward positive engagement in contrast to online exchanges. The dynamic aspect of "cool authenticity" implies a plausible sustained participation of younger generations in advisory capacities. Students were exposed to several competencies, encompassing the capacity to assess and differentiate reliable sources of scientific information, detect warning signs, and identify manipulation techniques frequently utilized in disinformation.

A preventive pedagogy of possible future scenarios must anticipate these challenges and cannot be based solely on the desire to forget past experiences. Proactive strategies, informed by a thorough understanding of evolving societal dynamics, are essential for preparing students to navigate emerging issues, such as embedding current and emerging societal issues into the curriculum. Also, continuous adaptation and responsiveness to the ever-changing landscape of public sentiment and concerns should be integral to educational approaches.

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