

A game-based educational experience to increase awareness about the threats of social media filter bubbles and echo chambers inspired by “wisdom of the crowd”: preliminary results

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1 Introduction

Social media are a game changer in the communication arena in terms of quantity, quality and origin of information users are exposed to. Yet, it’s not clear the outcome of multiple and continued interactions between users and information personalisation systems. These systems may skew the distribution of content and contacts presented to the users. If users are unaware of such mechanisms their perception of reality especially may be distorted [1–3].

Digital citizenship, intended as the proper and responsible use of digital technologies [4], and media literacy could enable users to critically approach social media and deal with its threats [5–9].

We propose that a preliminary training with respect to social media threats is needed for students and that merging educational activities with a guided, direct, and game-oriented experience of some social media threats [10–13] could be an effective method to raise students’ awareness of the impact of complex phenomena, such as information personalisation, social influence, filter bubbles, and echo chambers [14, 15]. Our intuition is that through direct exposition of one of the most impacting echo-chamber and filter bubbles consequences, i.e. when biased sampling distorts users’ unbiased opinions, and its explanation, the students will become more aware of these mechanisms and their effects.

2 Experiment description

The proposed experiment entails a game oriented social estimation task inspired by the “wisdom of the crowd” (WOC) [16] inside an educational activity aimed at rising awareness about social media influence and information personalization effects [16, 17]. The main components of the experiment are:

- **Questionnaires** participants answer multiple questionnaires before and after the experiment. They measure the impact of the WOC game through the change of participants’ perception of social media influence using a 6-points Likert scale (2 items). The questionnaires also estimate if users believe that privacy is protected on social media, how much time they spend on it, and their ‘Fear of missing out’ [18].
- **Digital media literacy talk:** It covers the differences between traditional media and social media with their complexity and pervasivity, the impact of cognitive biases, and, finally, their interplay with information personalisation algorithms, highlighting the concepts of echo chambers and filter bubbles.
- **WOC educational game:** It reproduces an experience of social media-like influence by repeating the following steps: i. an image showing a number of red points are presented to participants who answer with an estimation of the number of points; ii. social information is introduced showing an aggregated metric of all the answers[16, 17]; iii. participants give then a second estimation. In half the trials the social input is biased and magnifies the participants error, similarly to the effect of an echo chamber. After both conditions, we show and explain the expected results: unbiased social information improves performance [16], biased information affects performance.
- **Baseline:** Where results are not shown or explained to single out the effects of the WOC game.

Baseline and full activities were performed with two different high school classes respectively of 32 and 19 students.

3 Results

In the baseline condition, students did not show increased perceived social media influence between initial and final survey responses. Instead, when the full experiment is performed, i.e. performance in biased and unbiased conditions are compared and explained, there was an increase in the perceived social media influence (see table below).

Target	Self		Other	
Phase	Initial	Final	Initial	Final
Full	2.89 (19)	3 (18)	3.74 (19)	3.89 (18)
Baseline	3.08(32)	2.66 (32)	3.86 (32)	3.69 (32)

4 Limits and future work

Due to COVID restrictions the experiment were performed through remote connection, limiting engagement and number of trials. Predicted outcomes, consistent with the preliminary trials and established results [16], were used to deal with the noise affecting the WOC protocol with few participants [16].

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