

# VIRTUAL WORLDS; REAL CONCERNS

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RQ: “How does engagement with environmentally immersive virtual game environments correlate with players’ real-world climate concern across different countries, and what patterns emerge when in-game behavior is compared to public climate opinion data?”

## INTRODUCTION

The research examines how immersive environmental video games can influence players' climate awareness and concern. By exploring the link between virtual experiences and real-world attitudes, it highlights the potential of games as powerful tools for climate communication and education.

## LITERATURE

Recent studies (Ouariachi et al., 2019; Bekoum Essokolo & Robinot, 2022; Carman et al., 2024) suggest video games can foster climate awareness by enhancing emotional engagement and reducing psychological distance. However, most research relies on theory or surveys, with little analysis of how in-game behavior directly links to real-world climate actions.

## CONTRIBUTION

Analyzing merged datasets allows this study to link specific gameplay behaviors with real-world climate attitudes, beyond isolated patterns seen in independent data. This integrated approach offers deeper insights into how environmental storytelling in games can shape public perception and guide future climate education strategies.

## DATA HANDLING

We combined two global datasets—the Animal Crossing Survey (Vuong et al., 2021) and the People's Climate Vote Global Survey (UNDP & University of Oxford, 2021)—by standardizing country names and grouping them by region, scaling perception scores from 1 (strongly disagree) to 5 (strongly agree), and filtering to include only overlapping countries. The questions were also grouped according to environmental concerns. Both datasets are managed under FAIR (Findable, Accessible, Interoperable, Reusable) and CARE (Collective benefit, Authority to control, Responsibility, Ethics) principles to ensure data quality, transparency, and ethical, community-centered use.

## TOOLS & TECH



- Python in Google Colab: primary development environment
- Streamlit: build an interactive web app, users can access online
- Coblis (Color Blindness Simulator) was used to test the visual accessibility of the graphics
- Canva and power point was used for the flowchart and poster.

## SDG CONTRIBUTION



This project supports SDG 13 (Climate Action) by exploring how virtual games can raise environmental awareness, and SDG 17 (Partnerships for the Goals) through its interdisciplinary collaboration across psychology, game design, and climate science. By integrating behavioral and opinion data, it highlights how digital platforms and cross-sector partnerships can foster innovative climate engagement (UNDP, 2021; Flanagan & Nissenbaum, 2014).

## SCATTERPLOT

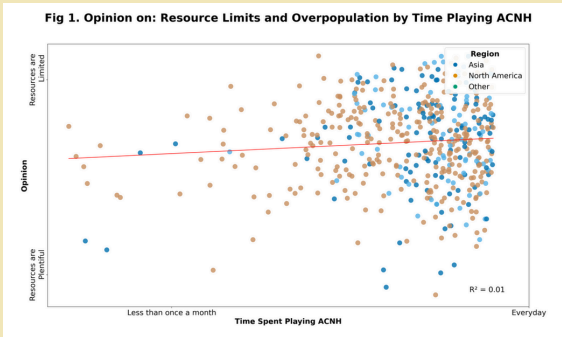


Fig 1. Agreement with Statements vs. Play Time

We used a color-coded scatter plot—with a best-fit line and its  $R^2$  coefficient—to illustrate the relationship between playtime and environmental opinions, ensuring both visual and statistical context (Anscombe, 1973). To save space, all survey items are combined into one interactive figure, with points colored by country for easy comparison.

## BOXPLOT

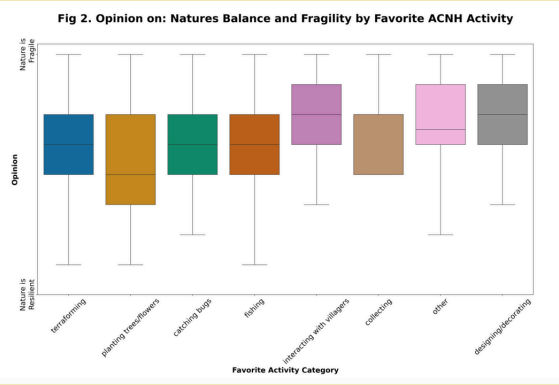


Fig 1. Agreement with Statements vs. Play Time

This box plot expands on some possible contributors to players’ opinions. Using the same variables as in Fig 1. this plot compares the range of opinions across players with different favorite in-game activities. This chart highlights not only central tendencies but also variability and asymmetry across the activity groups (Wilkinson, 2005; Tufte, 1983).

## GROUPED BAR CHART

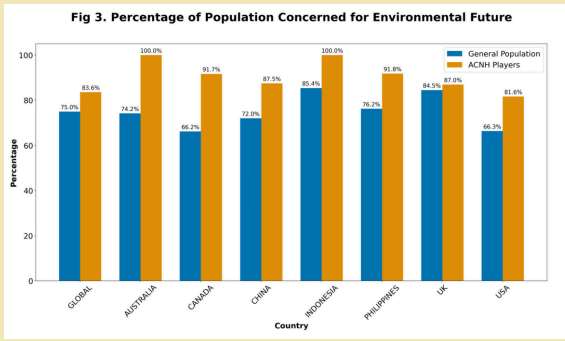


Fig 3. Percentage of Population Concerned for Enviornmental Future

A grouped bar chart compares simulated environmental concern between the general population and Animal Crossing players across countries, testing whether virtual environments influence real-world awareness. Following Talbot et al. (2014), this format enhances comparison accuracy by aligning bars on a shared baseline and reducing visual distortion.

## DISCLAIMER

This project was completed as part of the INFOSCI301 course at Duke Kunshan University (taught by Prof. Luyao Zhang).  
Github: <https://github.com/hollai465/FinalProject>  
Streamlit Visualization: <https://finalproject-t4xubdn2cznyernjn2l4sj.streamlit.app/>

## ACKNOWLEDGEMENT

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