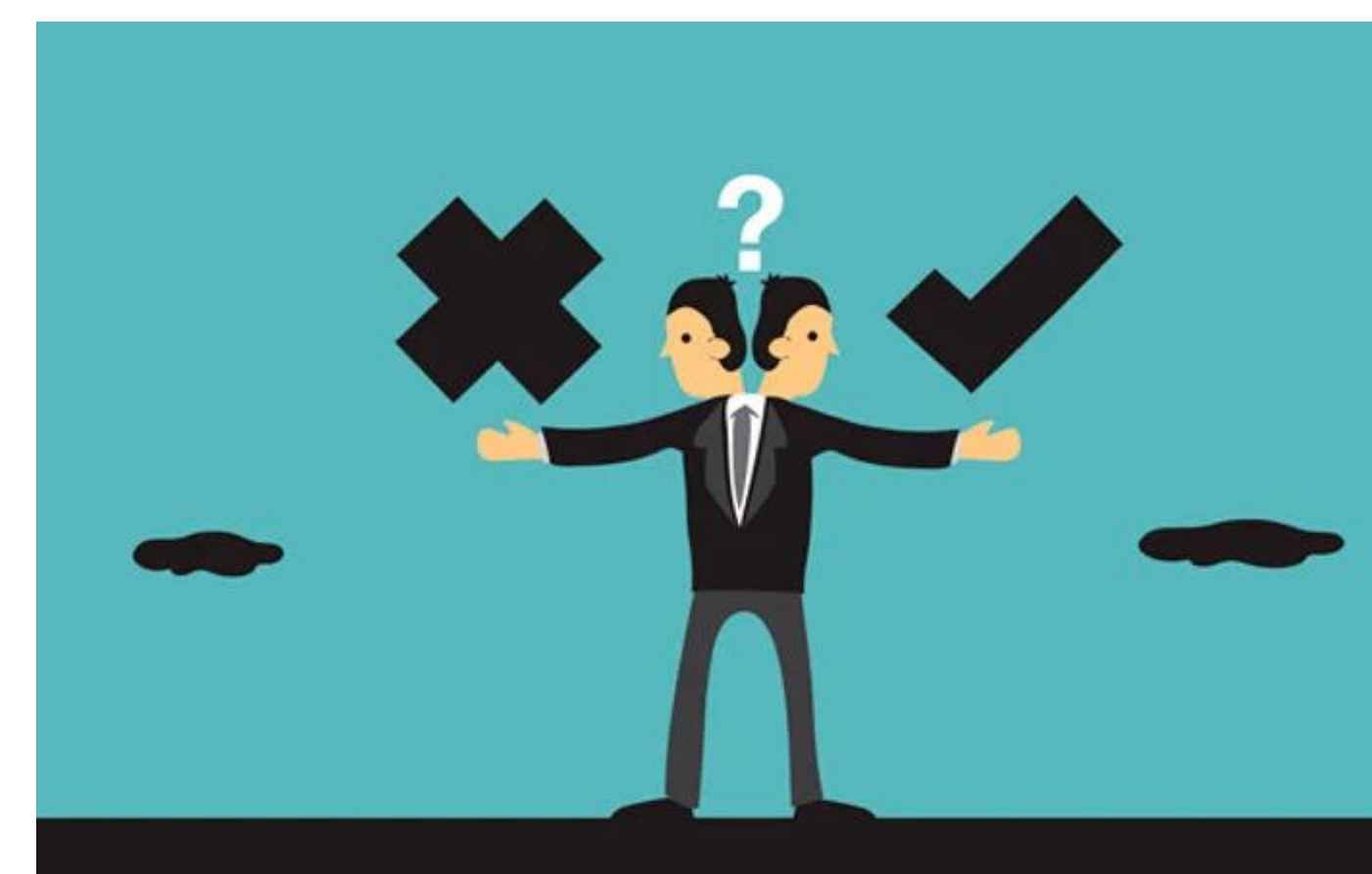


## Introduction

- Virtual reality has revolutionized the world through immersive and transformative experiences.
- Raise significant ethical and social challenges, such as data privacy and psychological effects on users.
- This bibliometric study analyses current research trends, identifying knowledge gaps and promoting ethical and sustainable technological development.

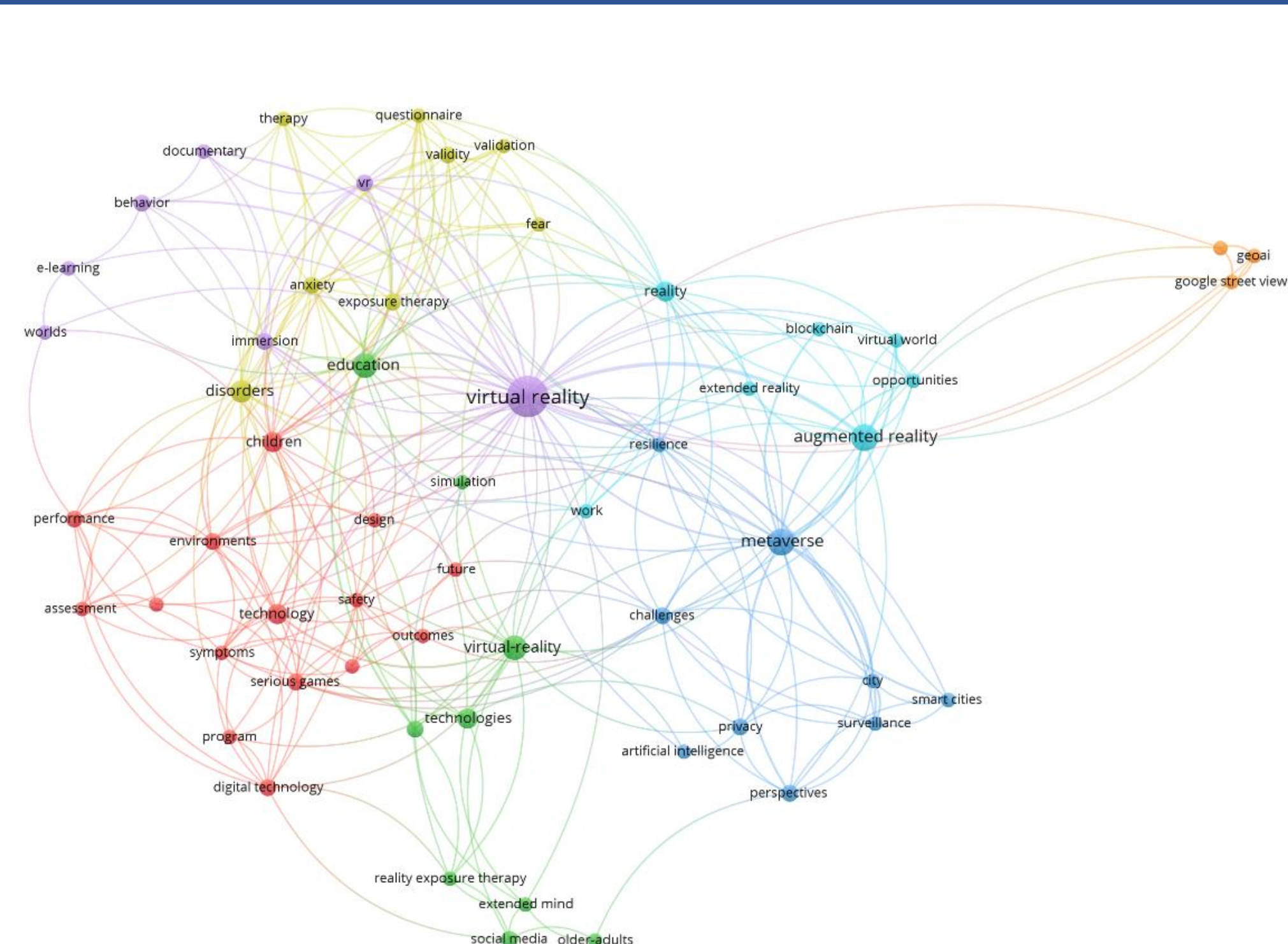


## Thematic trends

**Top keywords:** "virtual reality," "privacy," "therapy," and "education."

**Thematic networks:** connection between "metaverse" and "smart" cities", as well as between "ethics" and "mental health".

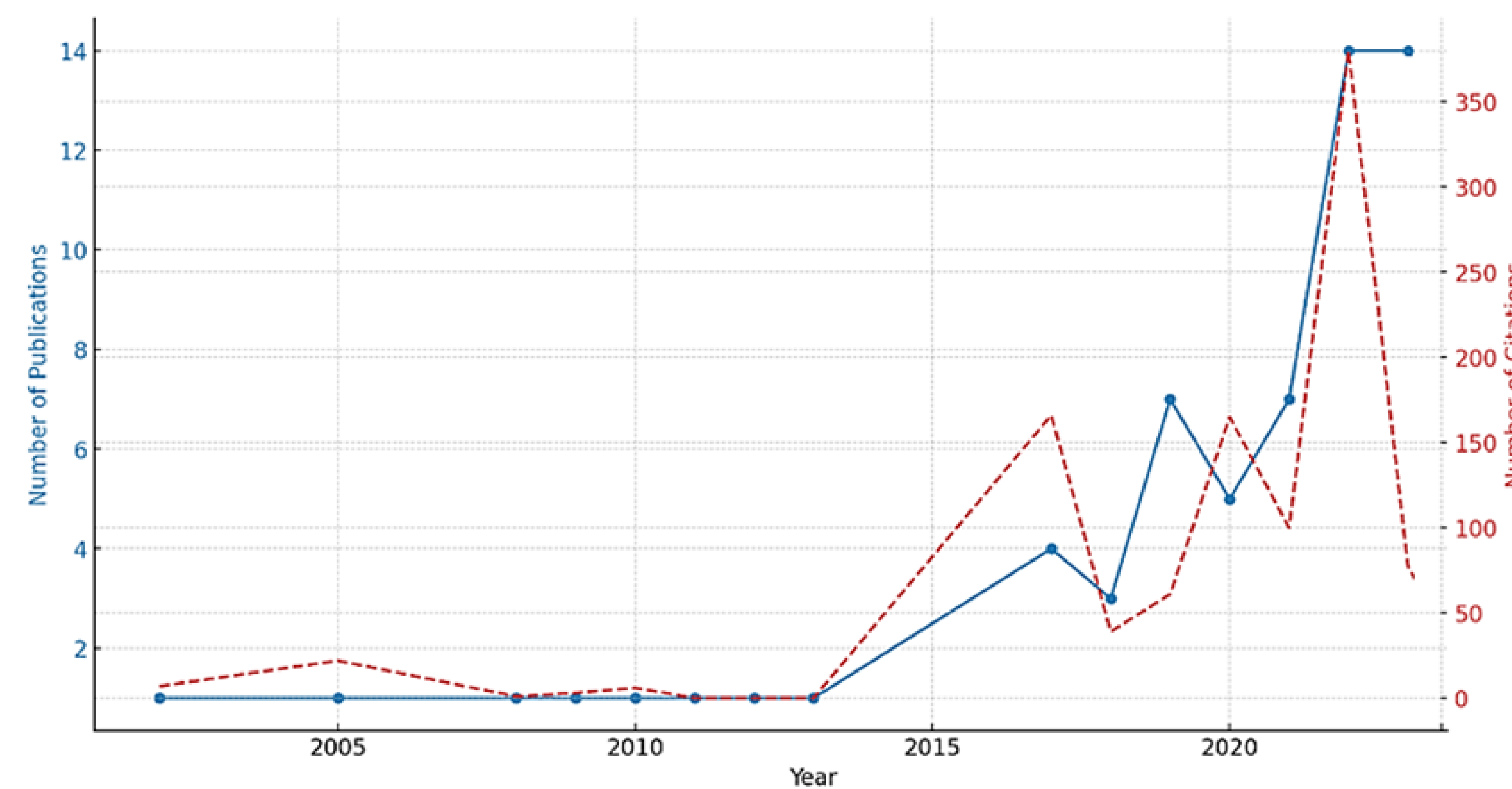
## Thematic trends



## Methods and Materials

- Database:** Web of Science (WoS)
- Inclusion criteria:** English, until December 2023
- Search strategy:** "ethical," "social," "challenges," "virtual," and "reality"

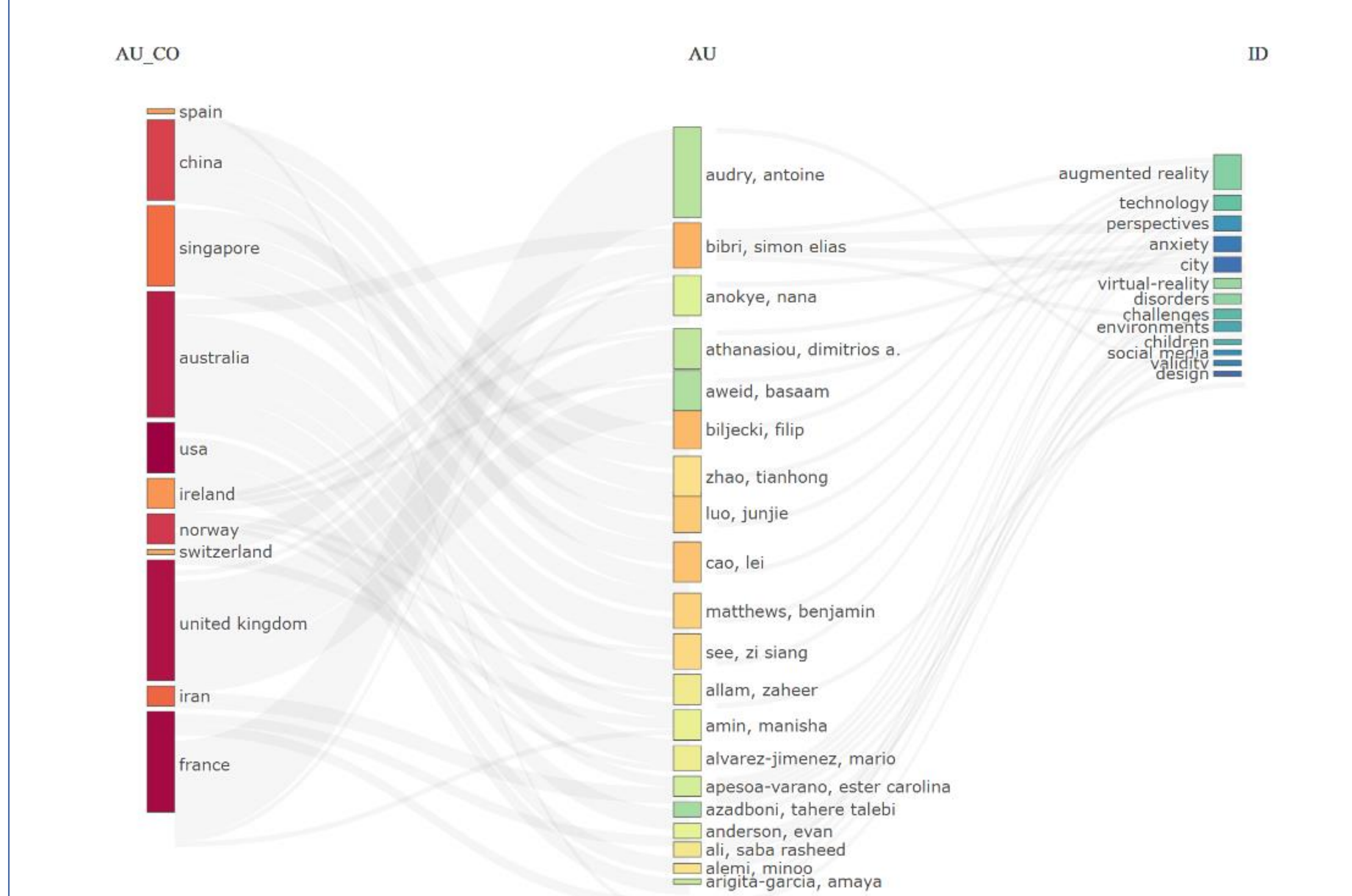
## Evolution of research



## Most Influential Publications

**Featured topics:** metaverse, mental health and education.  
"The Metaverse as a Virtual Form of Smart Cities" (2022), 235 citations.

## International collaboration

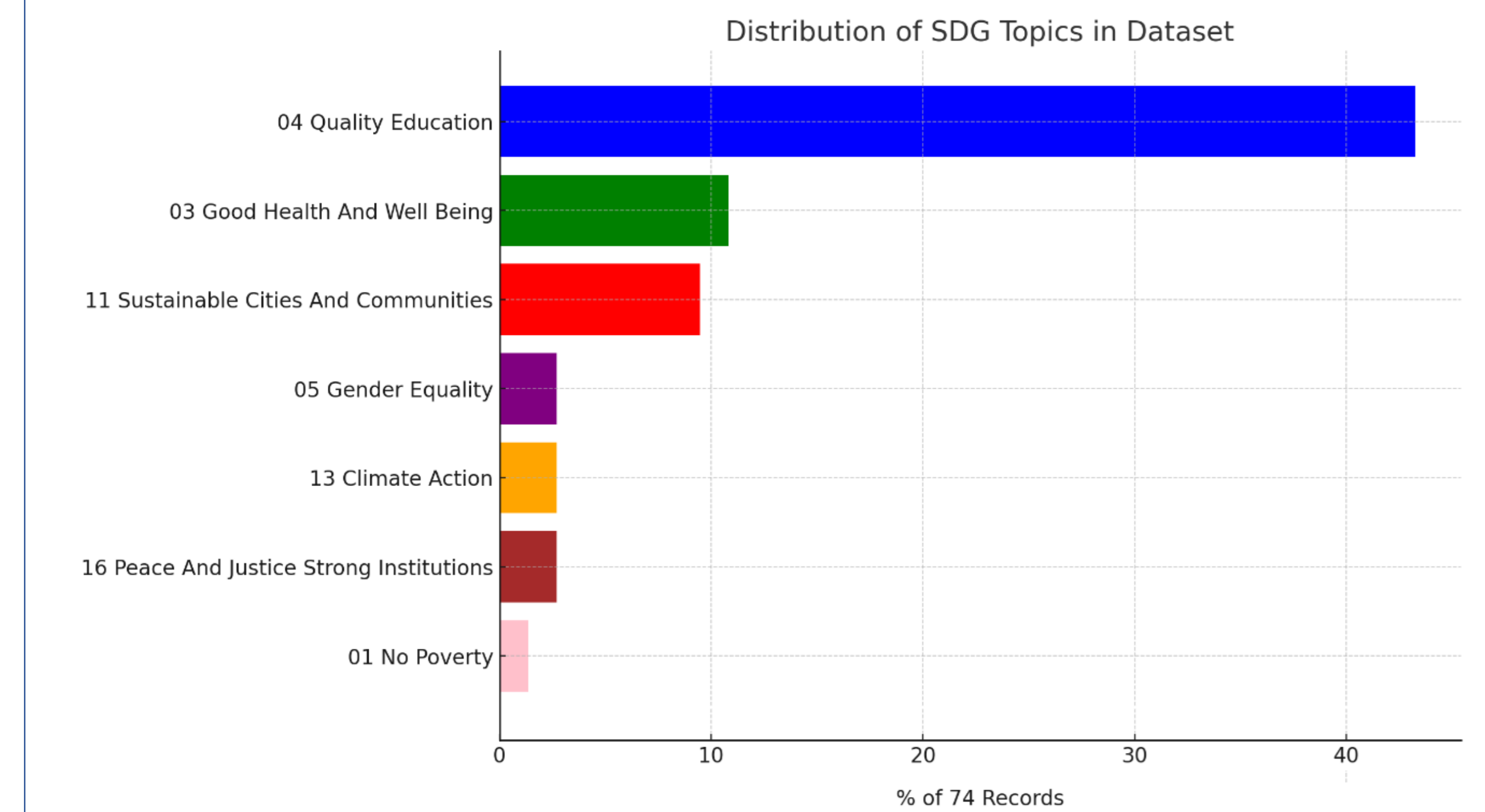


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## Impact on SDGs



- Most represented objective: SDG 4 - Quality education (40% of articles).
- Other highlights: SDG 3 - Good health and well-being and SDG 11 - Sustainable cities.

## International collaboration

- Leading countries: United States, United Kingdom, China, and Australia.
- Strong co-authorship networks across countries and key topics

## Conclusions

- Connect metaverse with smart cities and ethics with mental health.
- VR excels in education, health and sustainable cities.
- Data privacy, cyber addiction and social isolation.
- Lack of long-term impact analysis.
- Need for ethical frameworks and inclusive regulations.

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