

# CARMA 2024

## From Crisis to Opportunity: A Google Trends Analysis of Global Interest in Distance Education Tools During and Post the COVID-19 Pandemic

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Slides available at



Data and codes available at: [https://github.com/pridiltal/CARMA2024\\_Analysis](https://github.com/pridiltal/CARMA2024_Analysis)

Slides available at: [prital.netlify.app](http://prital.netlify.app)

This work was supported in part by the **RETINA** research lab, funded by the OWSD, a program unit of the United Nations Educational, Scientific, and Cultural Organization (UNESCO).



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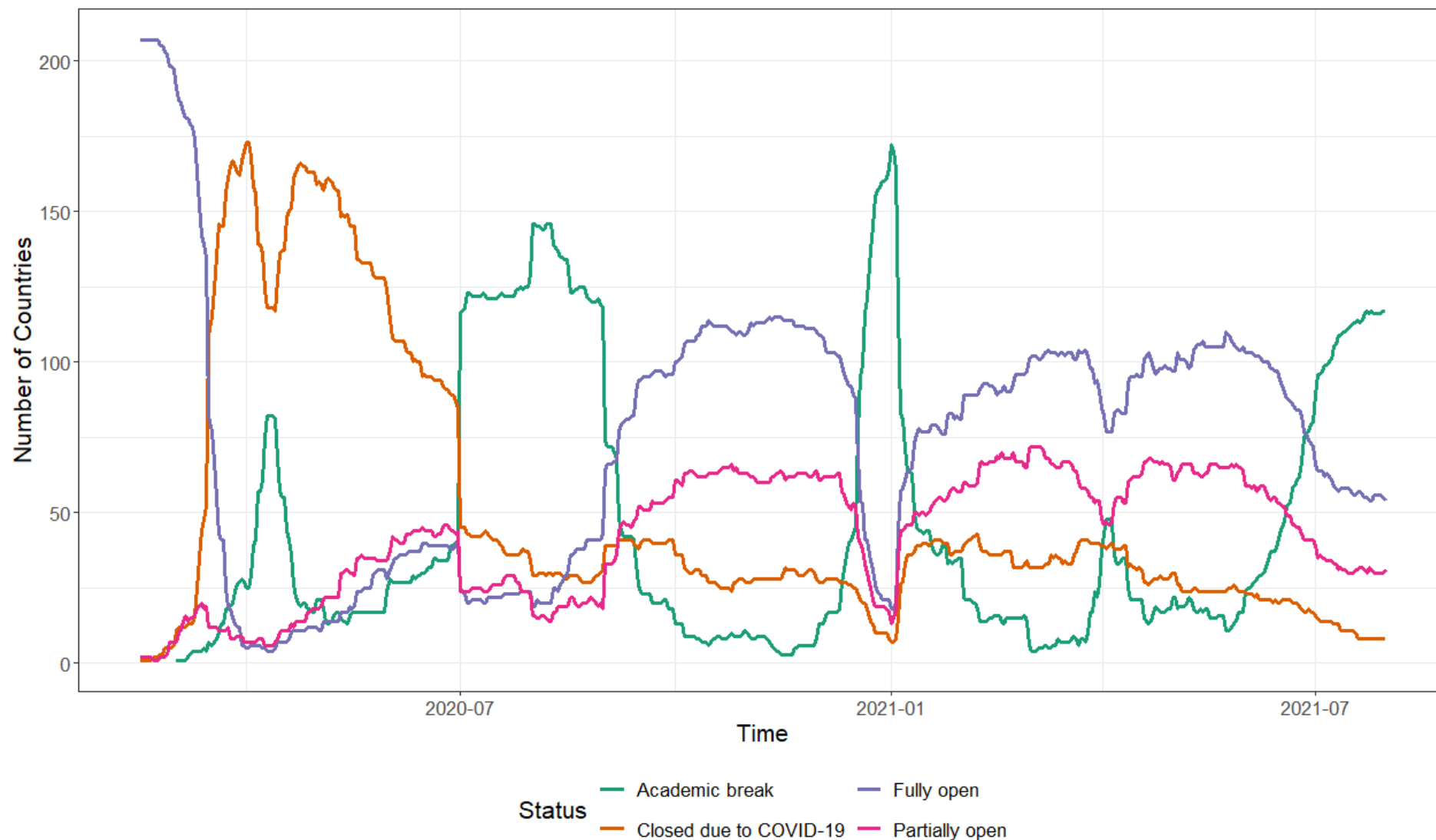


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# Global tracking of COVID-19 caused school closures and re-openings



Source: UNESCO (2020). COVID-19 educational disruption and response. [Online; accessed 13-May-2020]. <https://en.unesco.org/covid19/educationresponse>

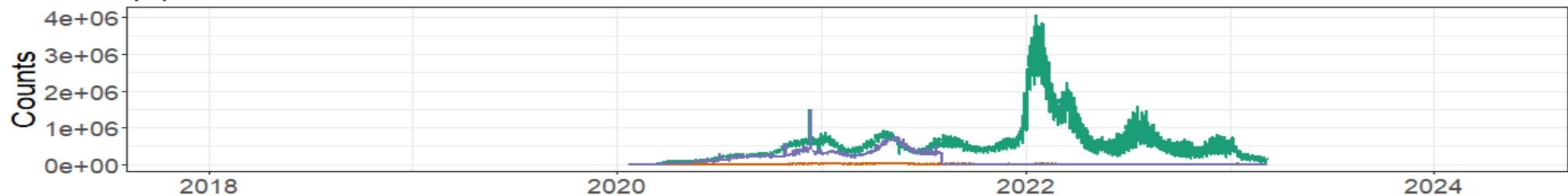


# From chalk-talk to **virtual walk**



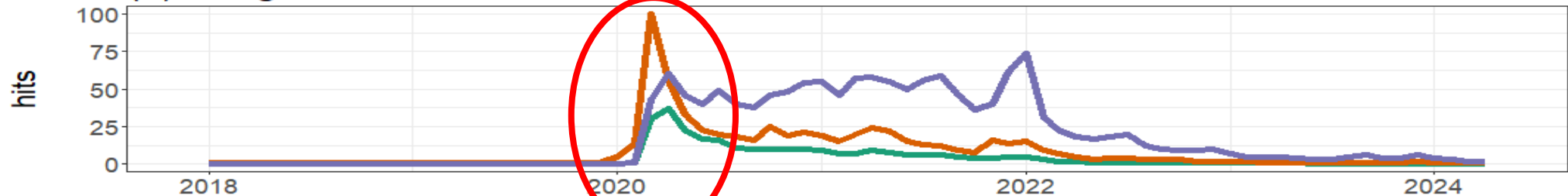
Image Credit: pixabay.com

(a) COVID-19 cases worldwide



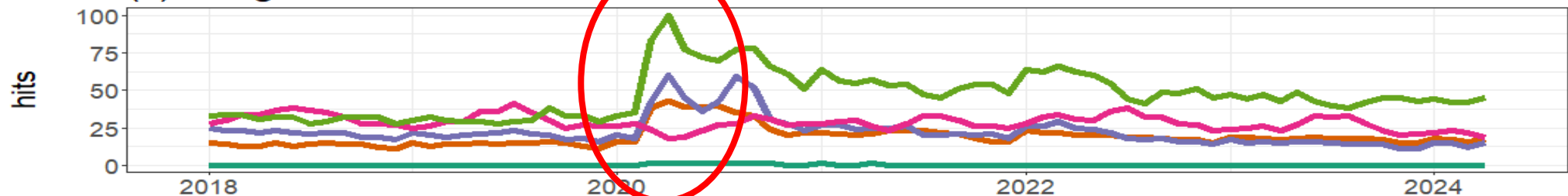
Type — confirmed — death — recovery

(b) Google search trends of COVID-19 related terms



keyword — covid 19 — corona — covid

(c) Google search trends of distance education-related terms

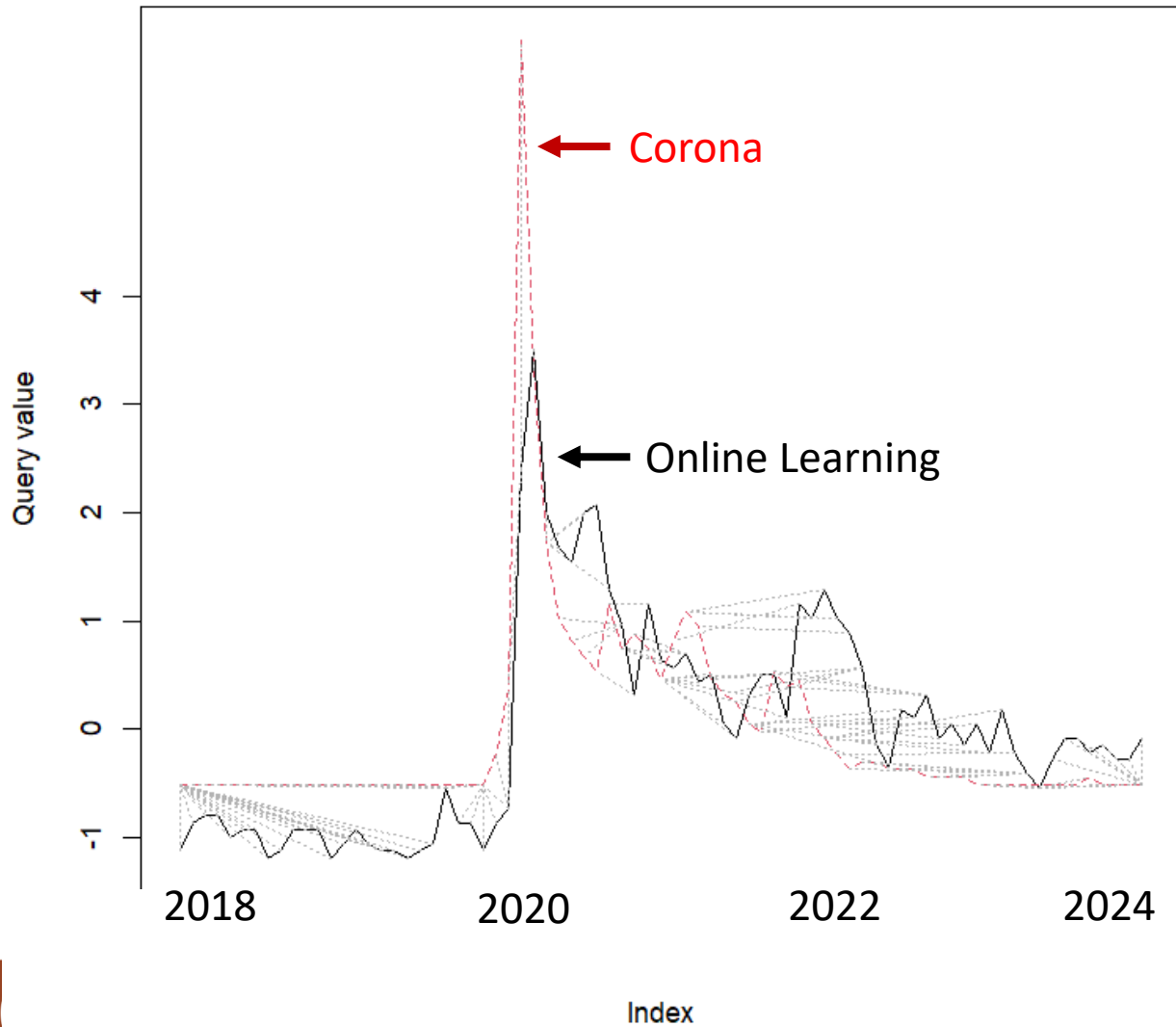


date

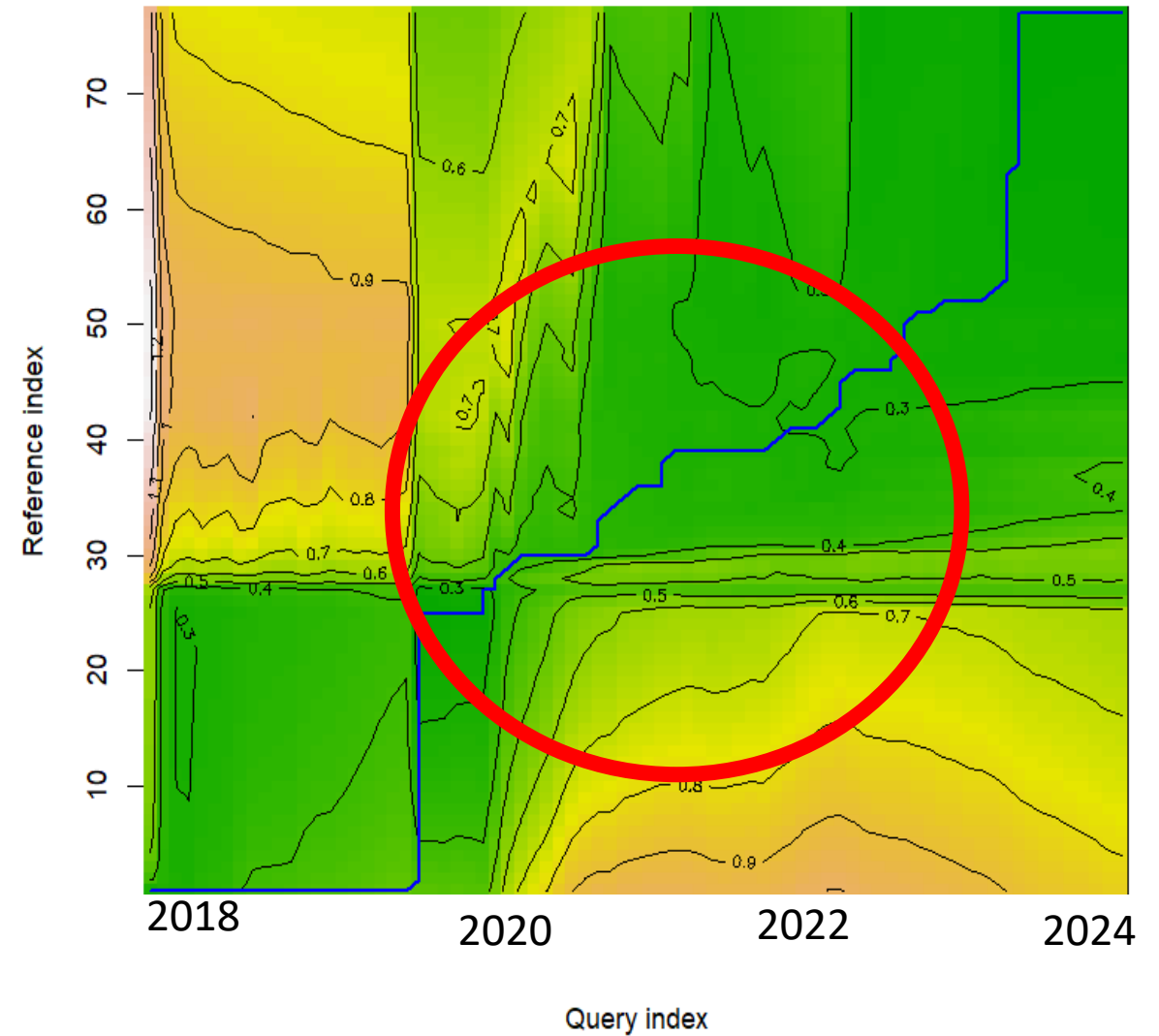
keywords — online proctoring — Distance learning — Online Learning  
— Online teaching — Distance education

# Dynamic Time Warping (DTW) Analysis

(a) Pointwise comparison between 'Online Learning' and 'corona'

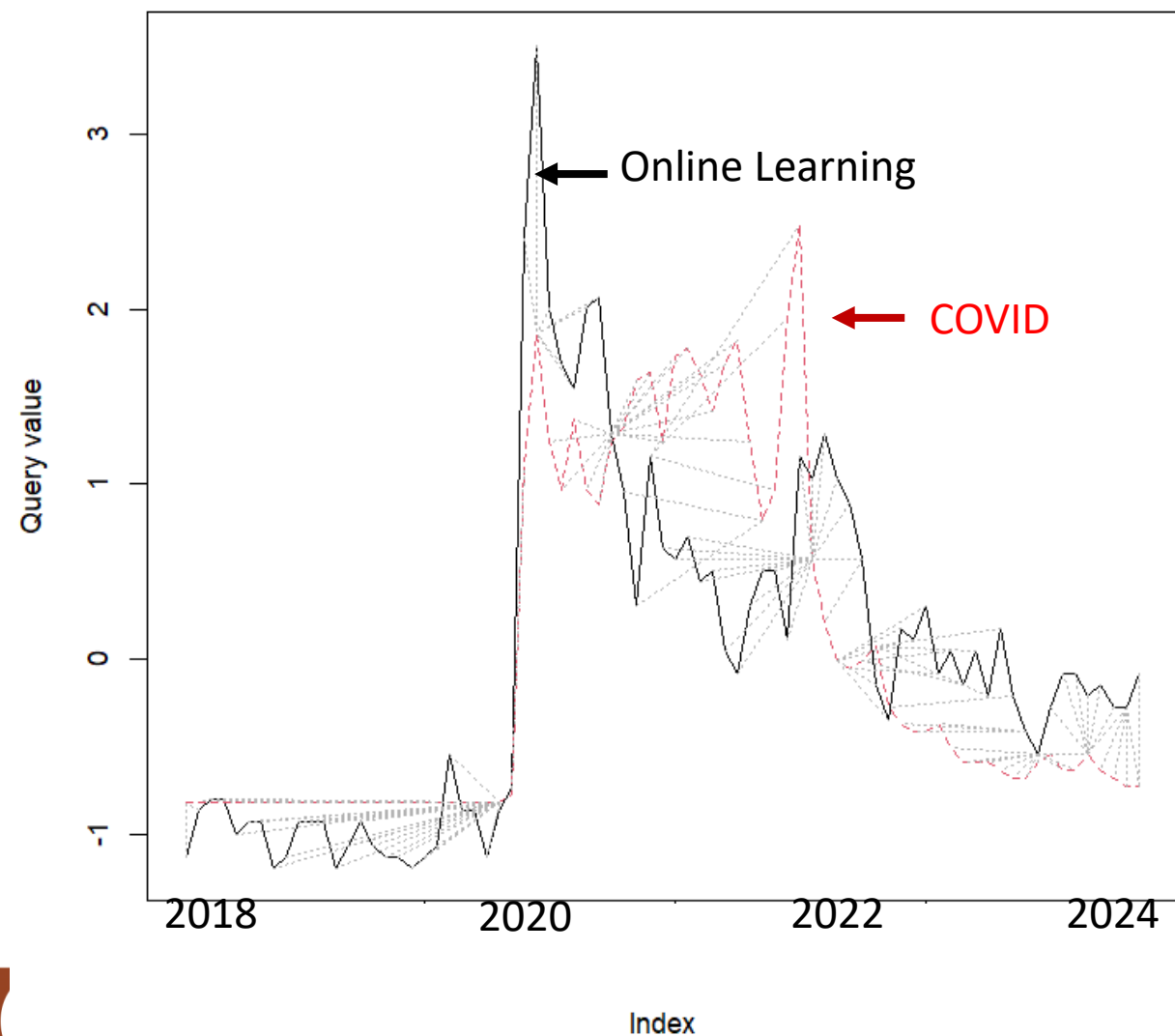


(b) Cumulative cost density with the warping path between 'Online Learning' and 'corona'

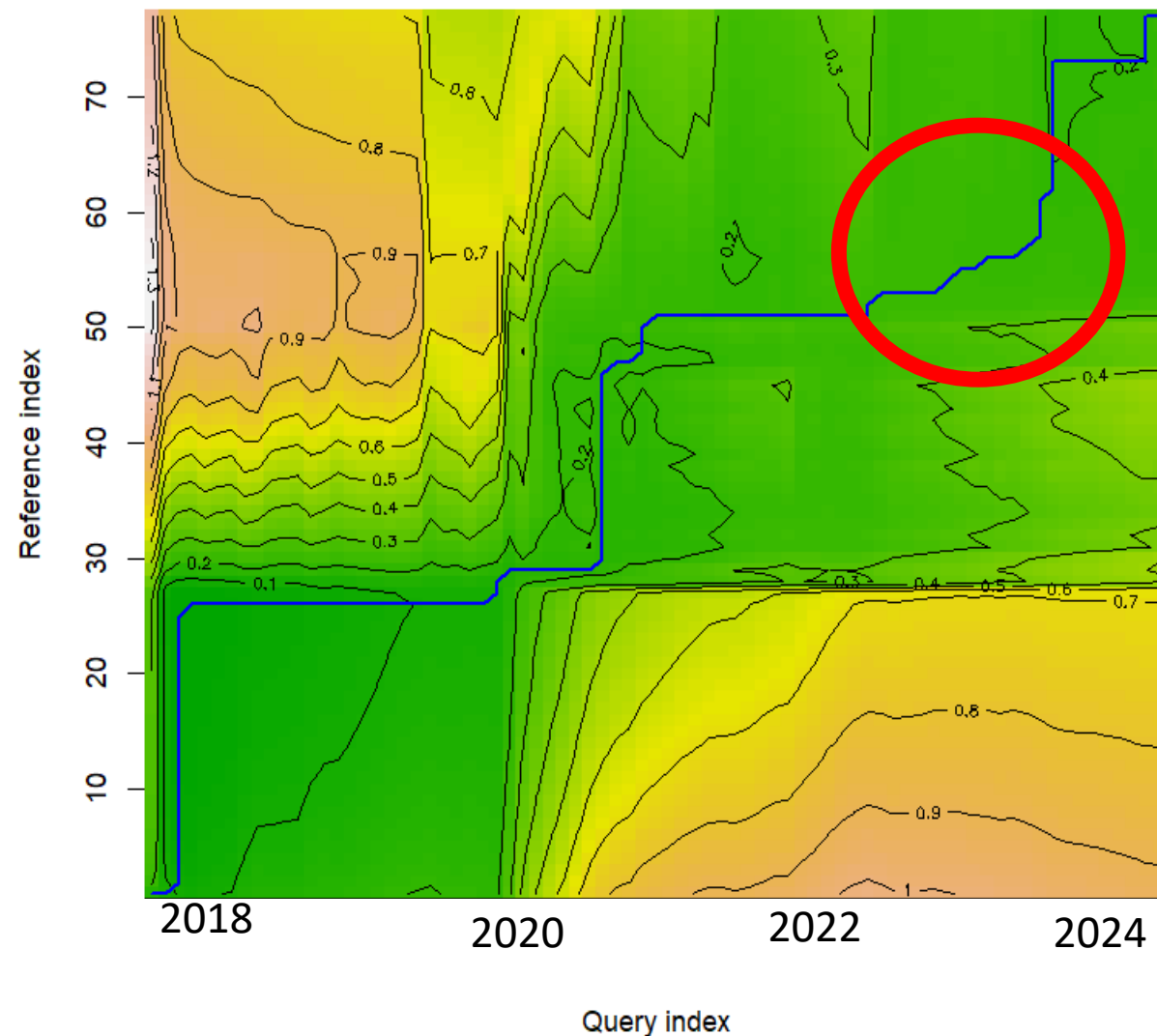


# Dynamic Time Warping (DTW) Analysis

(a) Pointwise comparison between 'Online Learning' and 'covid'



(b) Cumulative cost density with the warping path between 'Online Learning' and 'covid'







# Distance learning solutions

UNESCO (2020). Distance learning solutions. [Online; accessed 13-May-2020]. <https://en.unesco.org/covid19/educationresponse/solutions>

## More on UNESCO's COVID-19 Education Response

The list of educational applications, platforms and resources below aim to help parents, teachers, schools and school administrators facilitate student learning and provide social care and interaction during periods of school closure. Most of the solutions curated are free and many cater to multiple languages. While these solutions do not carry UNESCO's explicit endorsement, they tend to have a wide reach, a strong user-base and evidence of impact. They are categorized based on distance learning needs, but most of them offer functionalities across multiple categories.

## Resources to provide psychosocial support

- [InterAgency Standing Committee guidelines](#) to protect and improve people's mental health and psychosocial well-being in the midst of an emergency
- [WHO mental health and psychosocial guidance during the COVID-19 outbreak](#)
- UNICEF guidance on [how teachers should talk to children about COVID-19](#)
- UNICEF guidance on [how parents and caregivers can talk children about COVID-19](#)

## Digital learning management systems

- [CenturyTech](#) – Personal learning pathways with micro-lessons to address gaps in knowledge, challenge students and promote long-term memory retention.
- [ClassDojo](#) – Connects teachers with students and parents to build classroom communities.
- [Edmodo](#) – Tools and resources to manage classrooms and engage students remotely, offering a variety of



# Google Trends Analysis in Distance Education

- **Aim:** To explore if Google Trends search queries can be used as a proxy to quantify the popularity and public interest in various distance education options during and after the COVID-19 pandemic.
- **Google Trends:** An open-source web analytics tool offering insights into internet search behaviour.
- Provides a **relative search volume** scaled from 0 to 100, indicating interest relative to the highest point in the series for the chosen region and time.
- A value of 100 indicates the peak popularity of a term within the specified time frame.

# Google Trends Analysis in Distance Education

- **Timeframe:** December 2019 to April 2024
- **Key Questions:**
  - What solutions have emerged to meet the demands of distance education during and post COVID-19? (**Emergent Solutions**)
  - Which distance learning solutions have gained widespread attention and public interest? (**Public Interest**)
- Selected search terms based on UNESCO's list of distance learning solutions (UNESCO, 2020).
- Concentrated on the education category to improve data relevance and accuracy (Vaughan & Romero-Frías, 2014).
- Avoided acronyms to prevent confusion, focusing on specific tools and techniques in the market (Vaughan & Romero-Frias, 2014).

# Segmentation of Analysis

- Digital learning management systems
- Systems designed for basic mobile phone usage
- Systems with strong offline functionalities
- Massive Open Online Course (MOOC) platforms
- Self-directed learning resources
- Mobile reading apps
- Collaboration platforms facilitating live-video communication
- Tools for educators to create digital learning content
- External repositories of distance learning solutions
- Tools for Online proctoring
- Psychosocial support

# Handling Google Trends Query Limitations

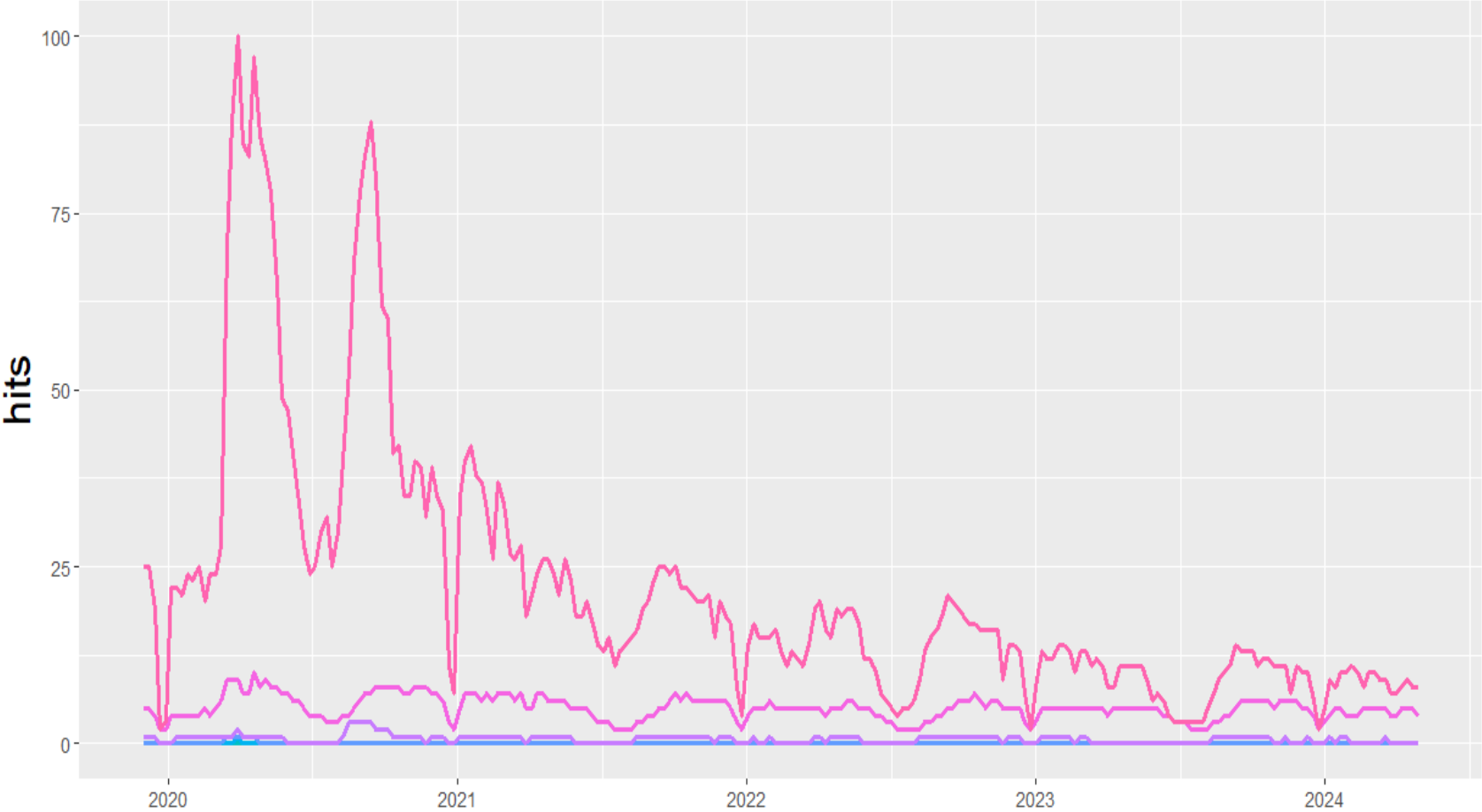
- In Google trends, it is possible to search for only up to five queries at a time.
- Under each segmentation, we entered up to five distance learning tools at a time and recorded their relative ranking scores.
- An iterative pairwise comparison was used to identify tool with the highest relative ranking score during the study period.
- Used this highest-ranked tool as a reference point for obtaining the relative ranking scores of other tools.





Image Source: <https://www.didasko-online.com/wp-content/uploads/2022/09/LMS-and-learning-icons-with-man-using-computer-as-background.jpg>

# Digital learning management systems



- |             |                 |         |                  |
|-------------|-----------------|---------|------------------|
| CenturyTech | EkStep          | Skooler | Schoology        |
| ClassDojo   | Nafham          | Seesaw  | Moodle           |
| Edraak      | Paper.Airplanes | Edmodo  | Google.Classroom |



Image Source: <https://www.intelligenthq.com/wp-content/uploads/2018/06/Online-course-certificates.jpg>

## Massive Open Online Course (MOOC) platforms

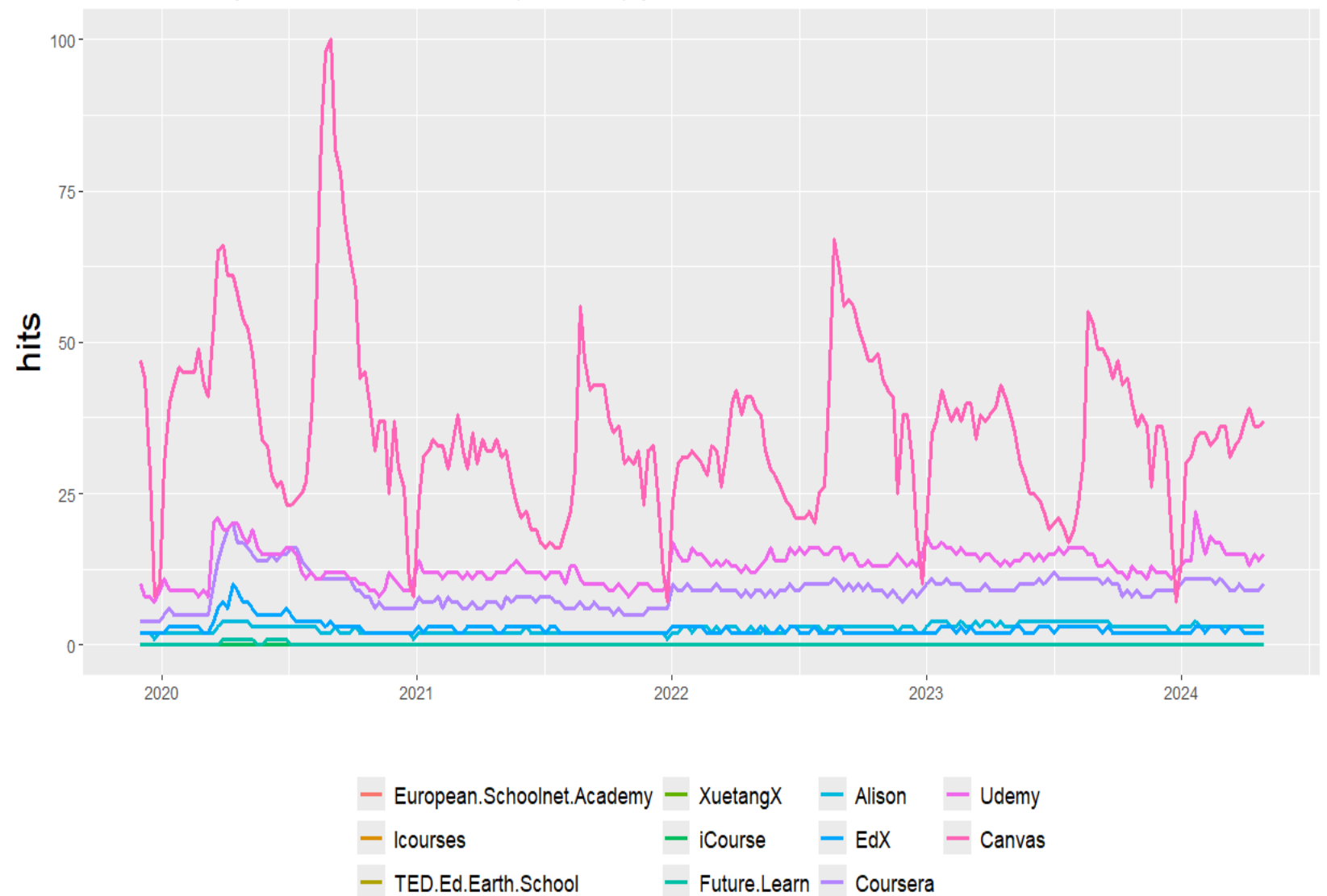
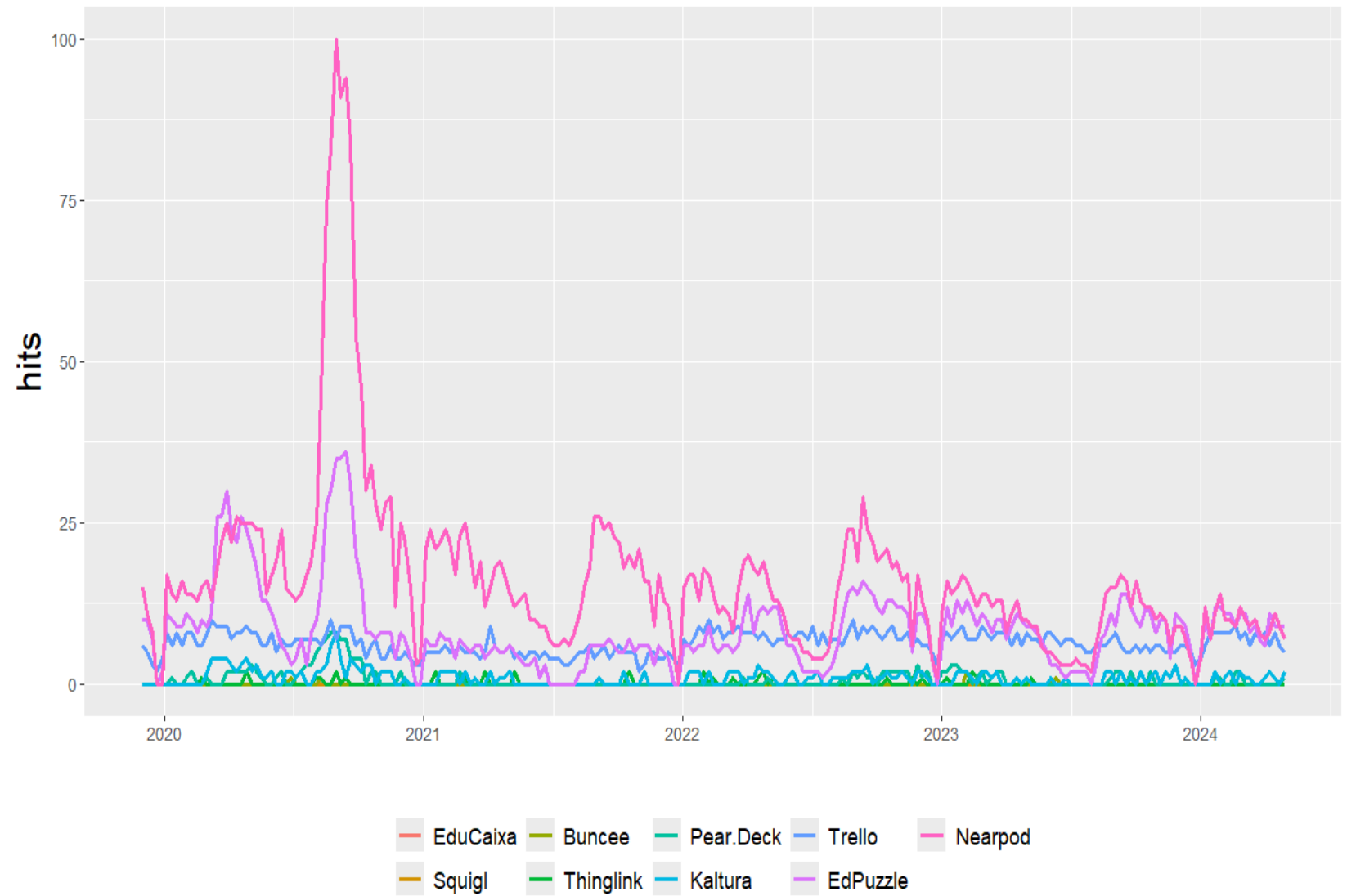




Image Source: <https://www.linkedin.com/pulse/lack-training-teachers-use-new-technologies-why-our-education-/>

## Tools for teachers to create of digital learning content







## Self-directed learning content

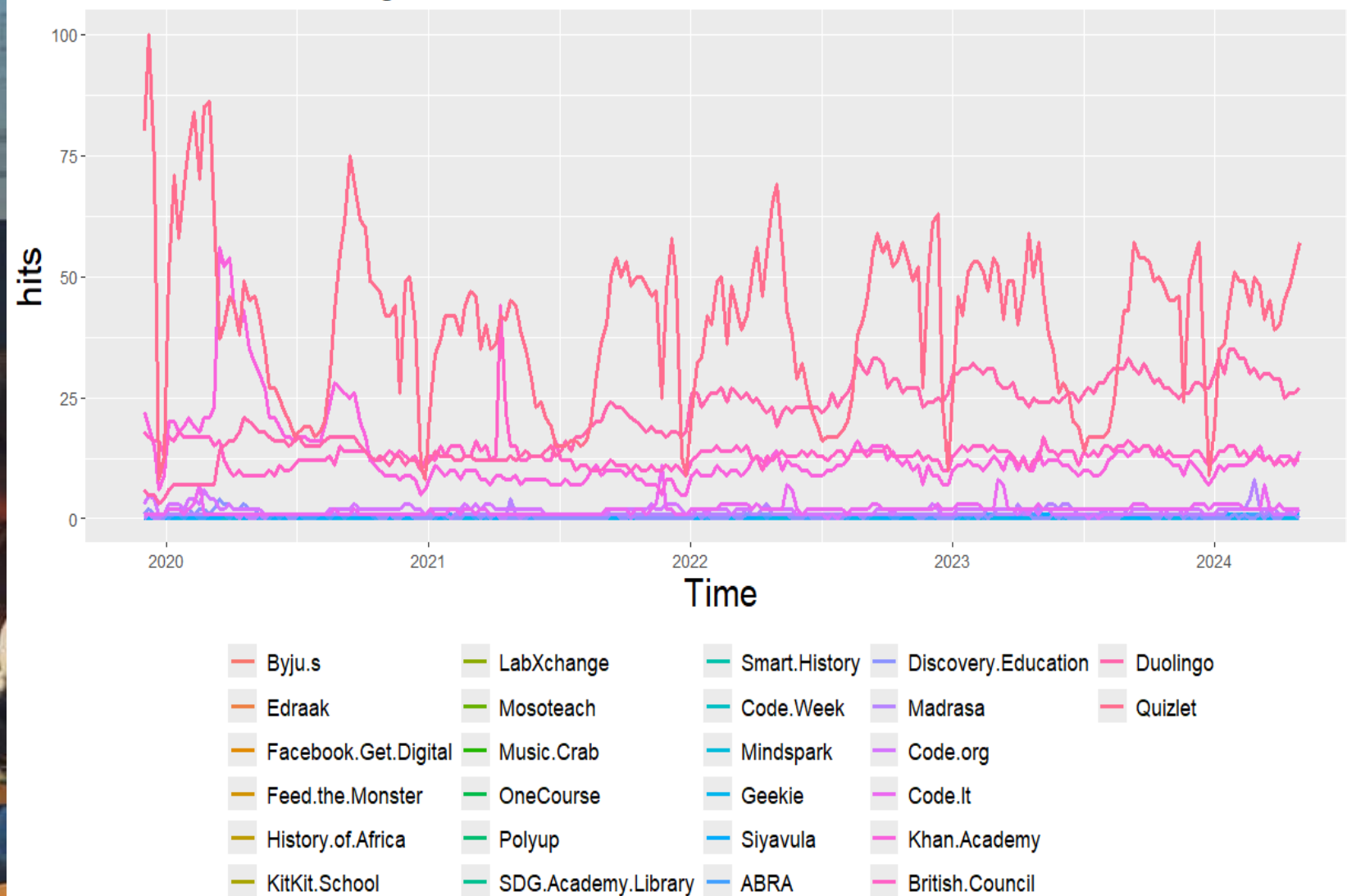






Image Source:  
[https://beerconnoisseur.com/sites/default/files/blogs/2022/role\\_of\\_education\\_in\\_the\\_modern\\_world\\_of\\_technologies/remote-working-1024x681-1-900x599-1.jpg](https://beerconnoisseur.com/sites/default/files/blogs/2022/role_of_education_in_the_modern_world_of_technologies/remote-working-1024x681-1-900x599-1.jpg)

## Mobile reading applications





## Collaboration platforms that support live-video communication

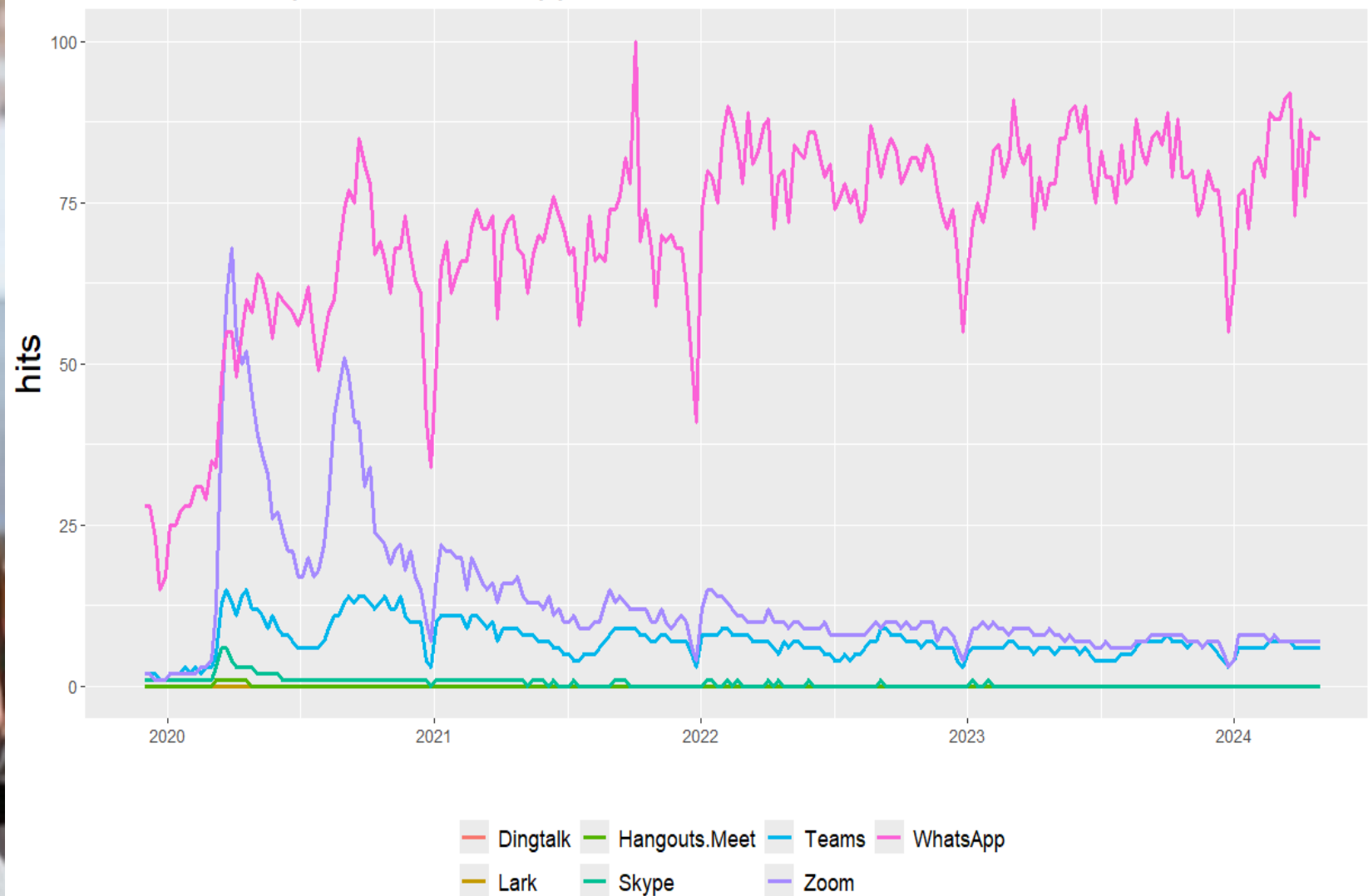




Image Source: <https://cdn.elearningindustry.com/wp-content/uploads/2021/01/is-remote-proctoring-the-future-of-academia.png>

## Tools for online proctoring

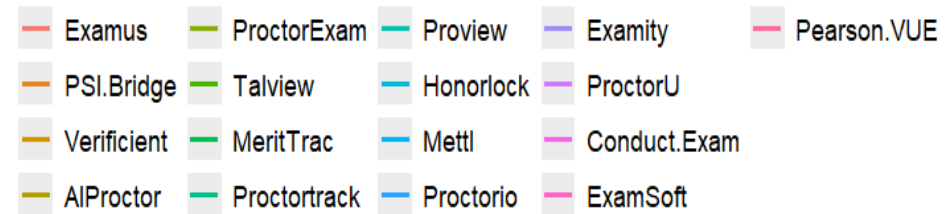
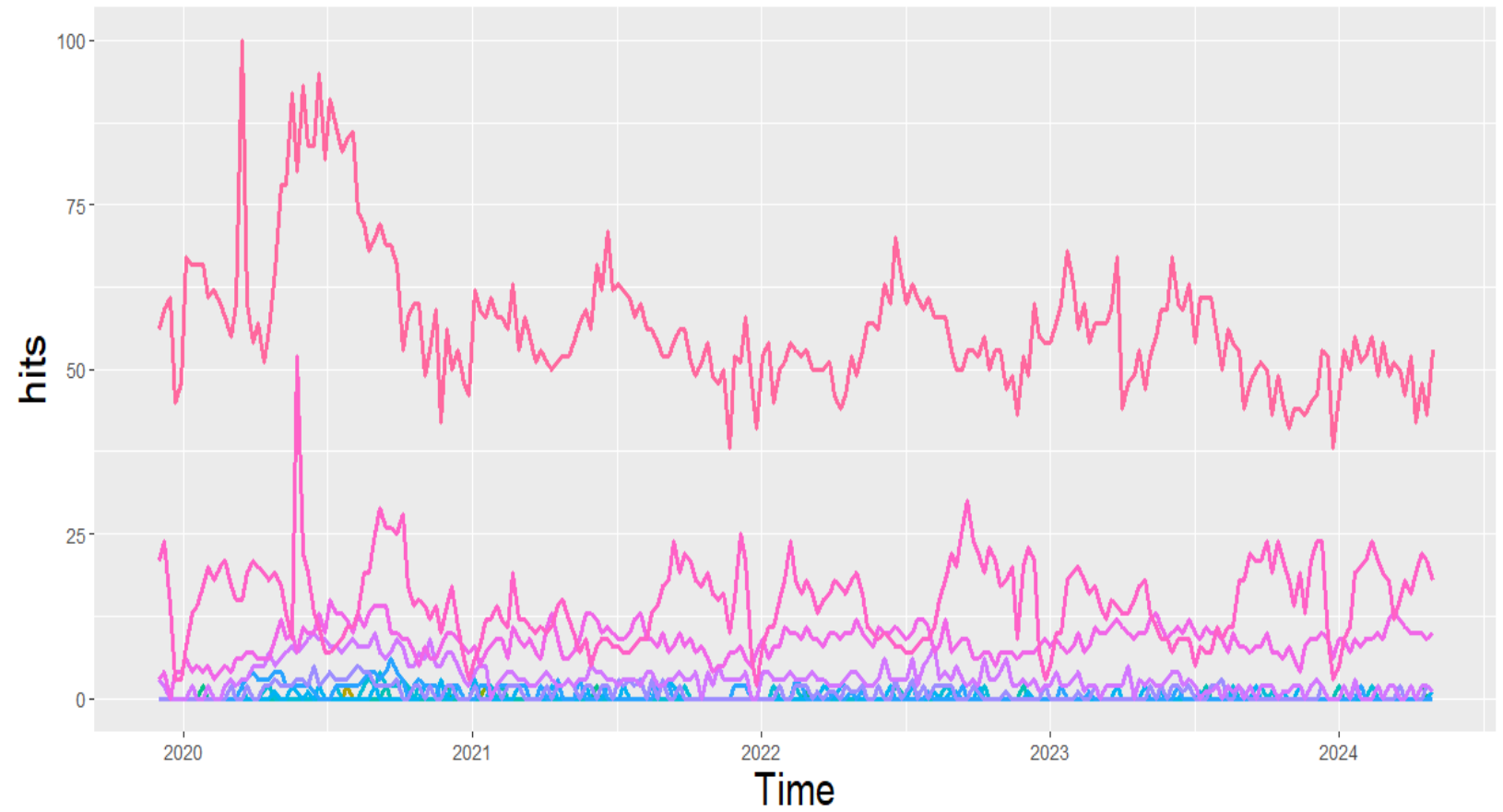






Image Source: <https://www.language magazine.com/wp-content/uploads/2020/03/GettyImages-1174366520-300x174.jpg>

# External repositories of distance learning solutions

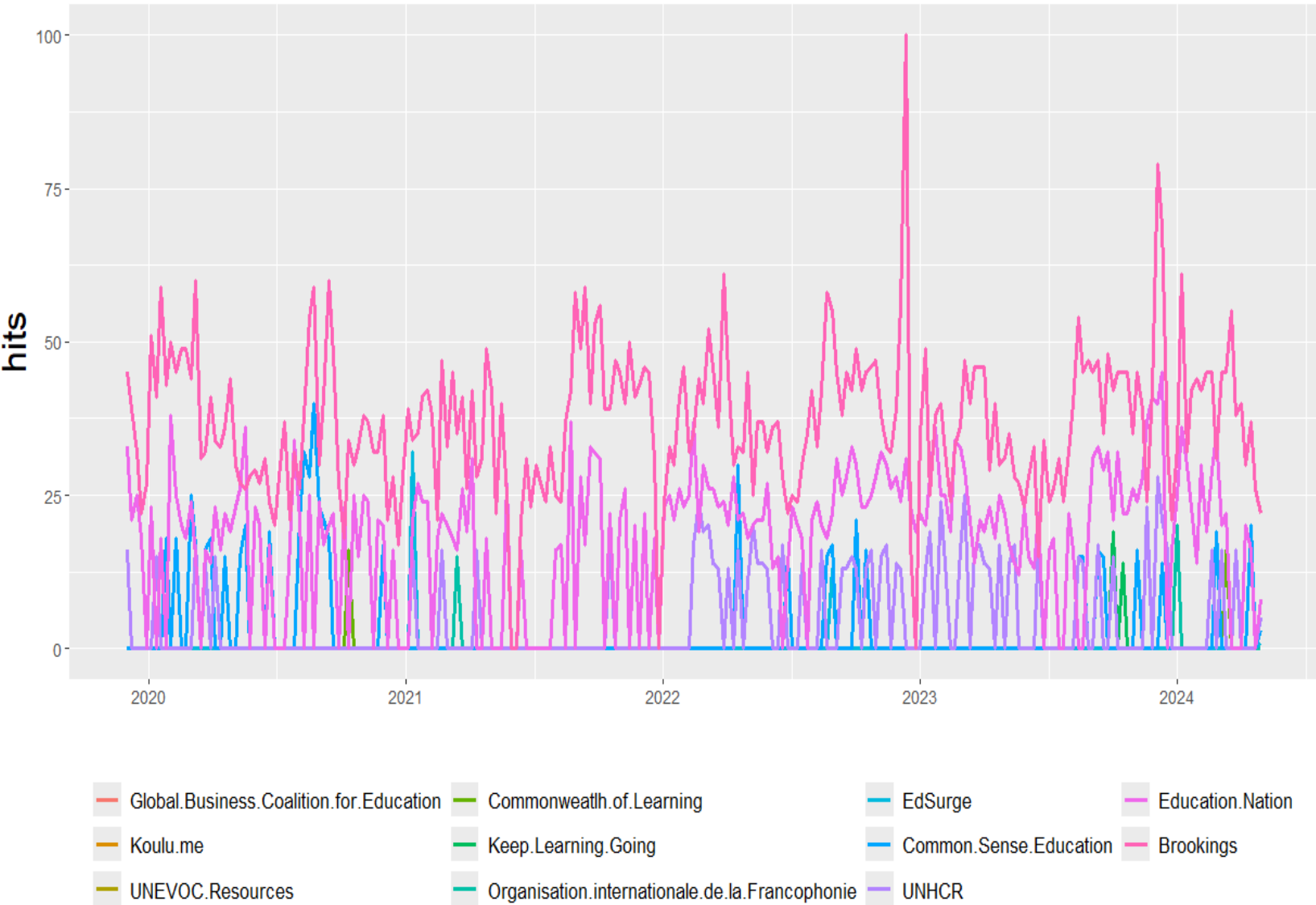






Image Source: <https://medium.com/@i.vikash/designing-a-mobile-application-architecture-for-offline-use-e03e7731f4f2>

## Systems with strong offline functionality

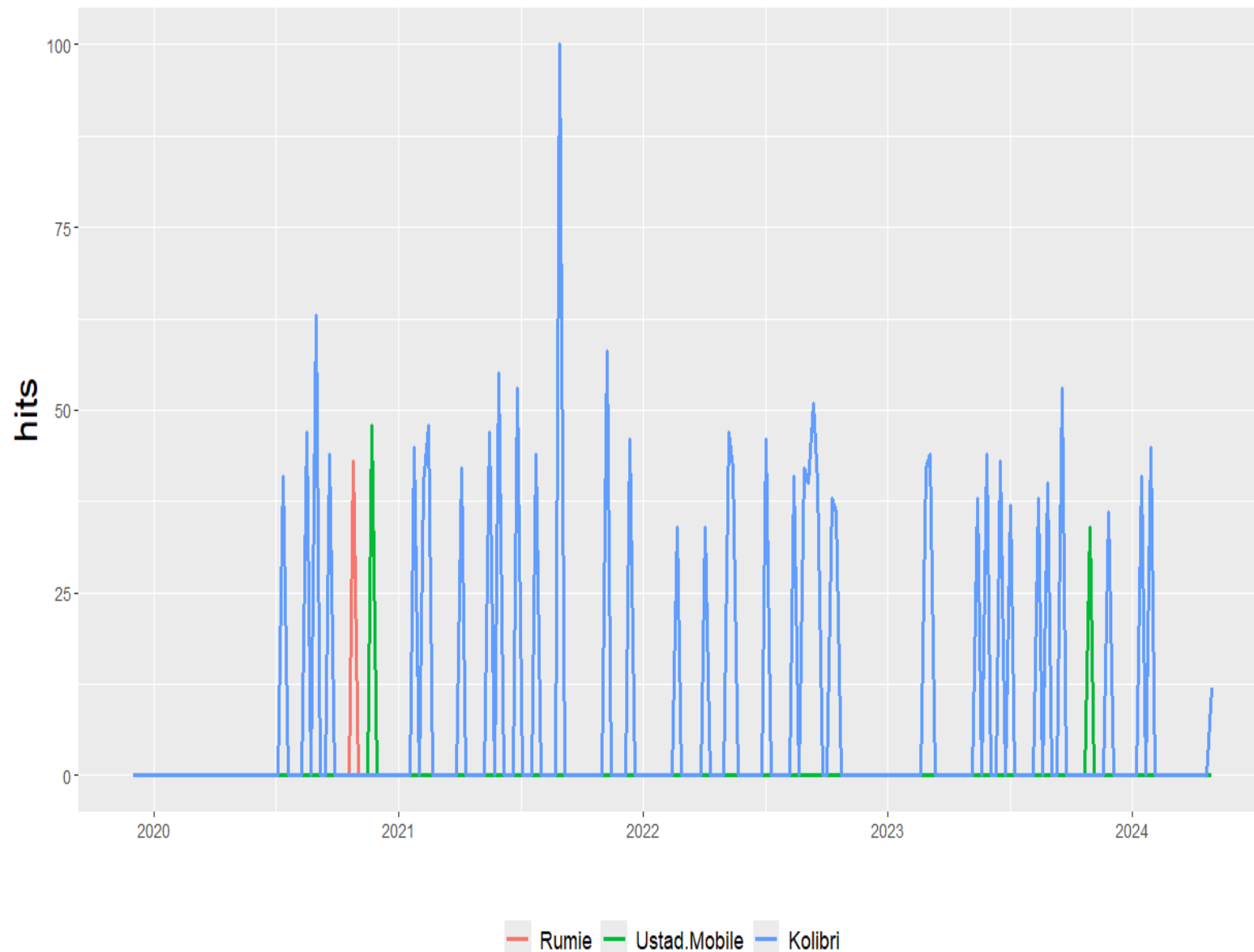
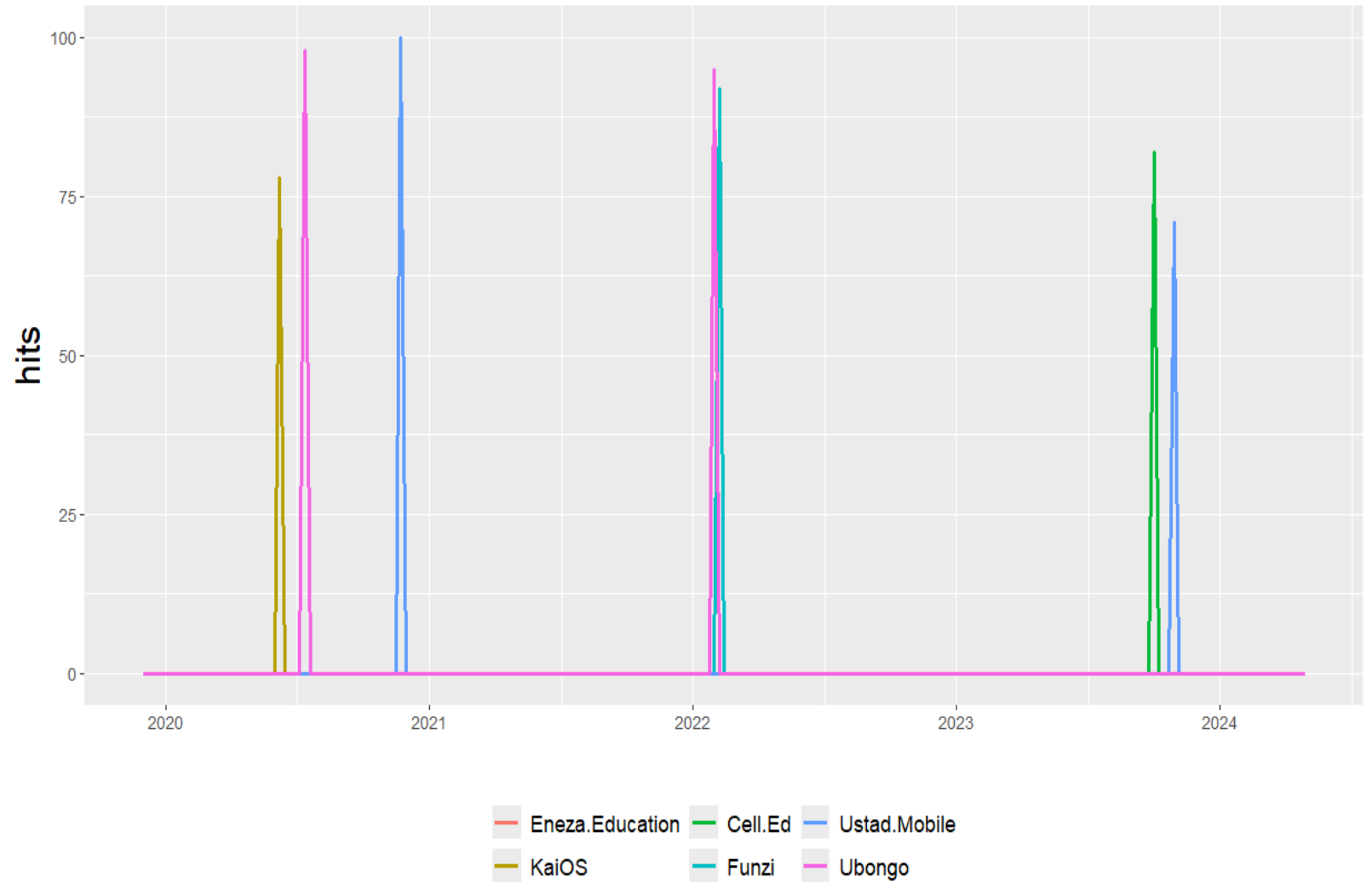


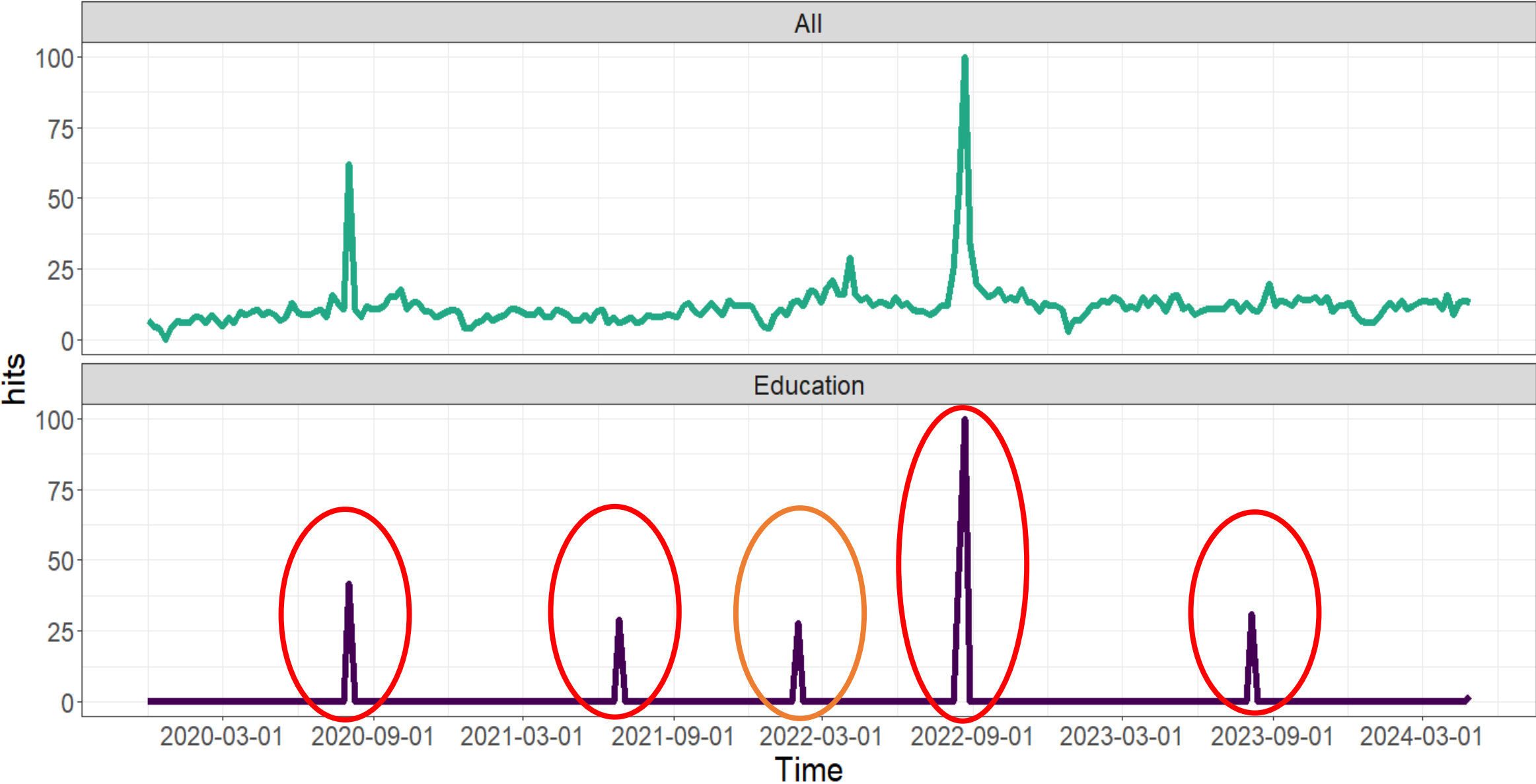


Image Source: <https://elearningindustry.com/wp-content/uploads/2020/09/mobile-learning-what-is-it.jpg>

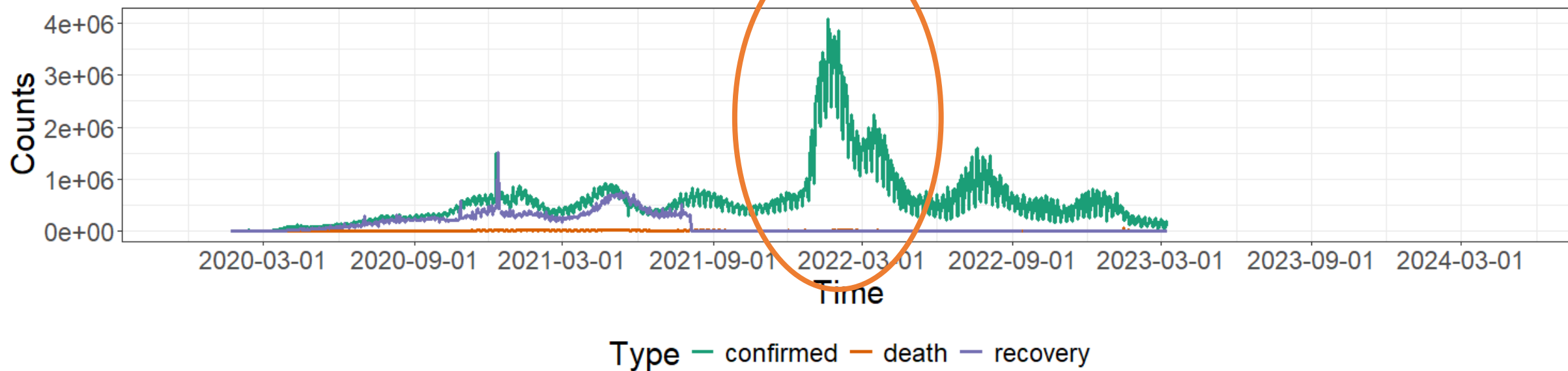
## Systems built for use on basic mobile phones



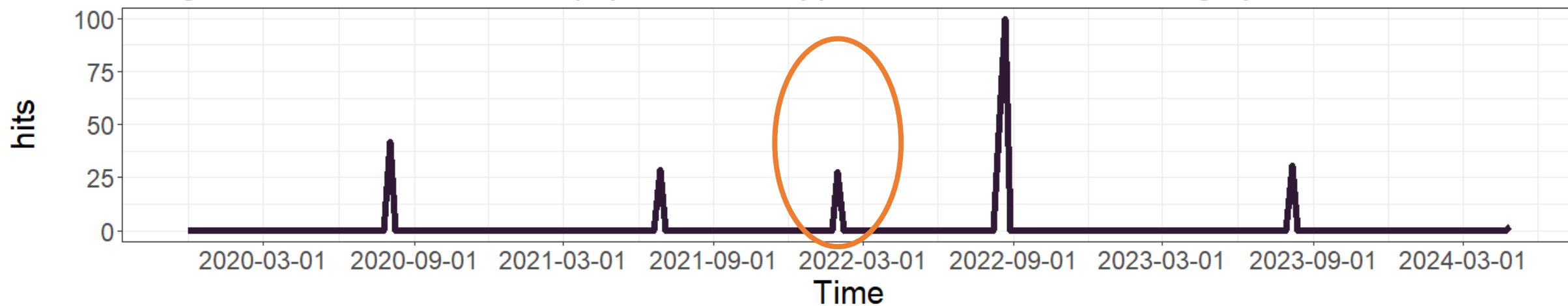
Google search trend of the term psychosocial support under 'All' categories and 'Education' category



## COVID-19 cases worldwide



## Google search trend of the term psychosocial support under 'Education' category





# Main Contributions

- Facilitates navigation through the multitude of market options available.
- Enables informed decision-making with **minimal time and effort**.
- Provides valuable information for identifying competitors and enhancing tool efficacy.
- Guides developers and educational institutions to improve and innovate existing tools.
- Highlights the critical need to address overlooked aspects of mental health support during academic breaks and school closures.

# What Next ?

- Popularity does not guarantee quality.
- Future research should evaluate the efficiency and effectiveness of popular tools to ensure engaging online learning experiences.
- Reflects search behavior of internet users only.
- Further investigation at national and regional levels to understand the specific needs and challenges in different areas.
- Further research should assess the accuracy, reliability, and coverage of Google Trends data to enhance its utility (Cebrián et al. ,2023)

# Thank you

This work was supported in part by the **RETINA** research lab, funded by the OWSD, a program unit of the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

Data and codes available at: [https://github.com/pridiltal/CARMA2024\\_Analysis](https://github.com/pridiltal/CARMA2024_Analysis)



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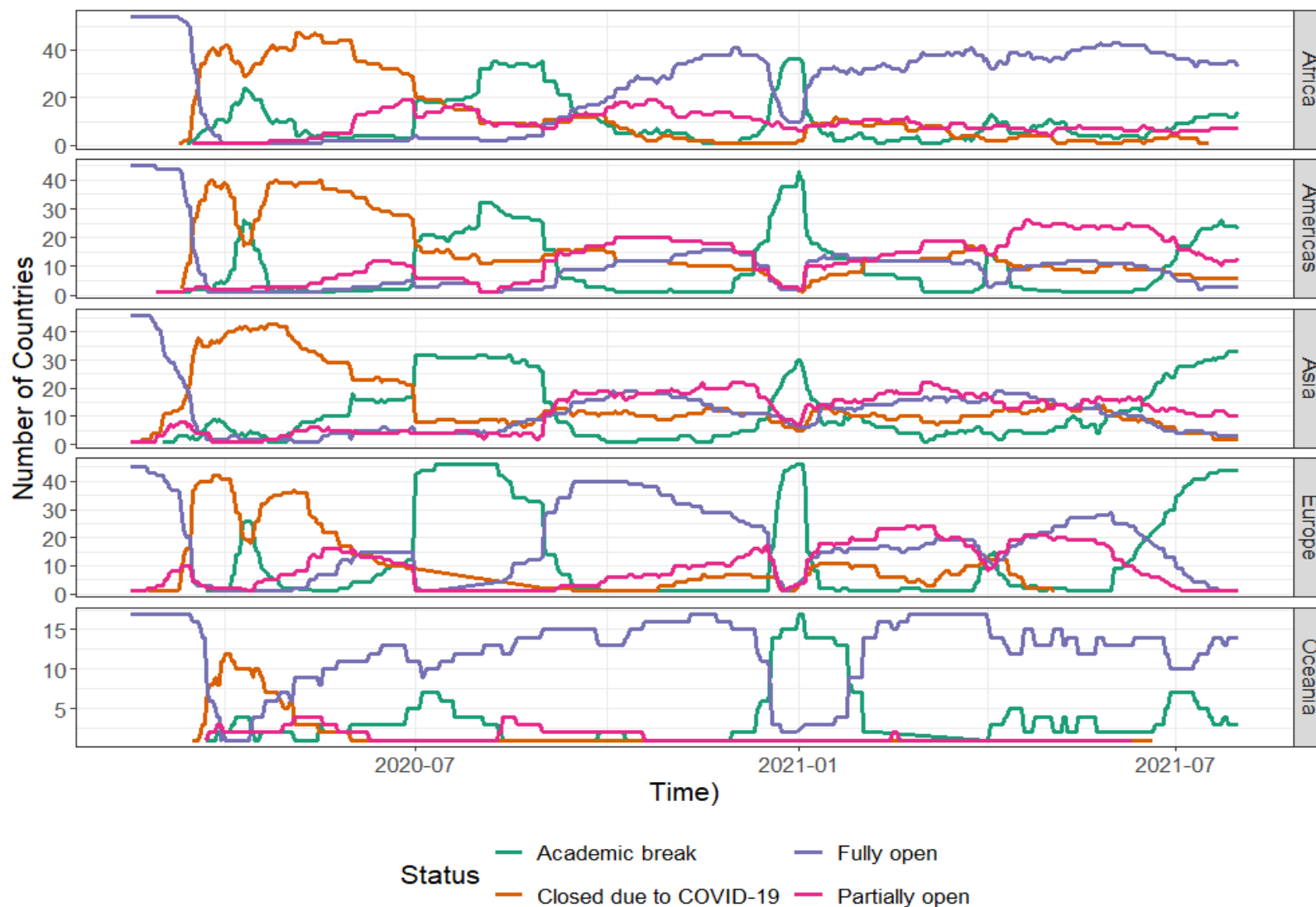
Slides available at





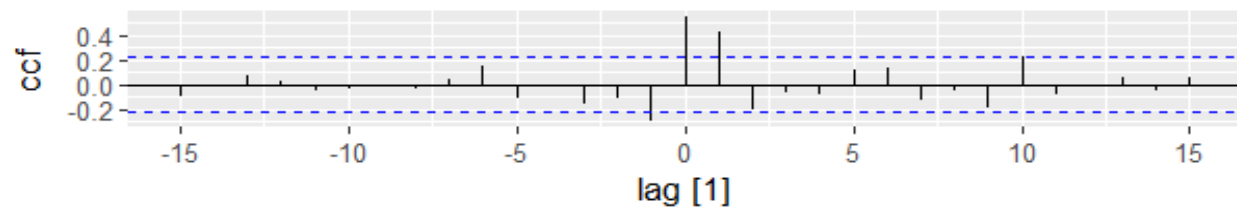


# Region wise tracking of COVID-19 caused school closures and re-openings

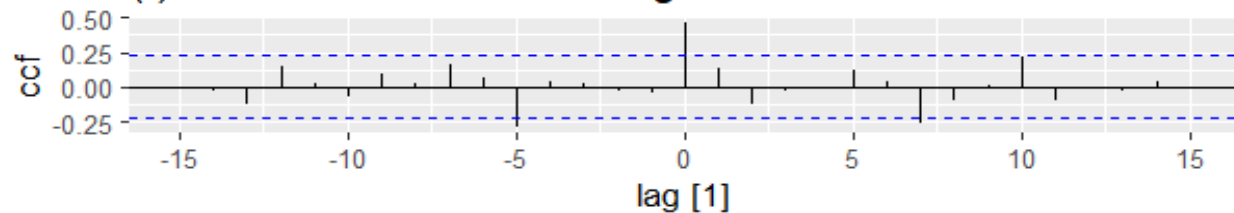


Source: UNESCO (2020). COVID-19 educational disruption and response. [Online; accessed 13-May-2020]. <https://en.unesco.org/covid19/educationresponse>

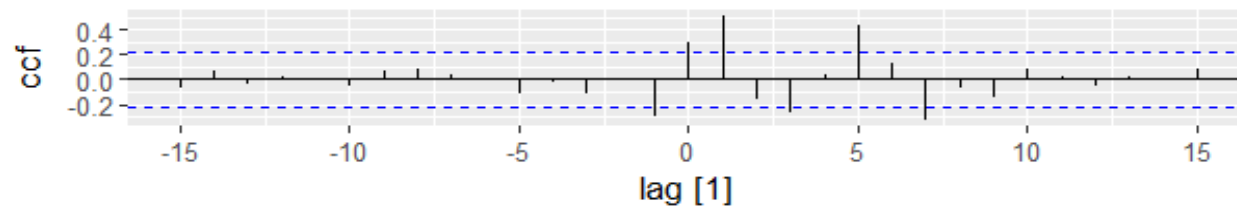
(a) 'Corona' with 'Online learning'



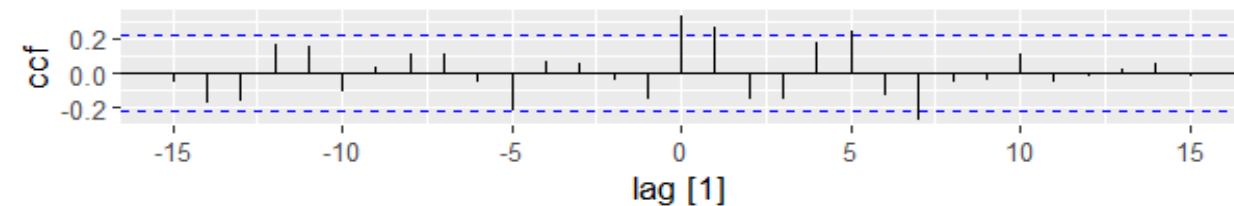
(f) 'Covid' with 'Online learning'



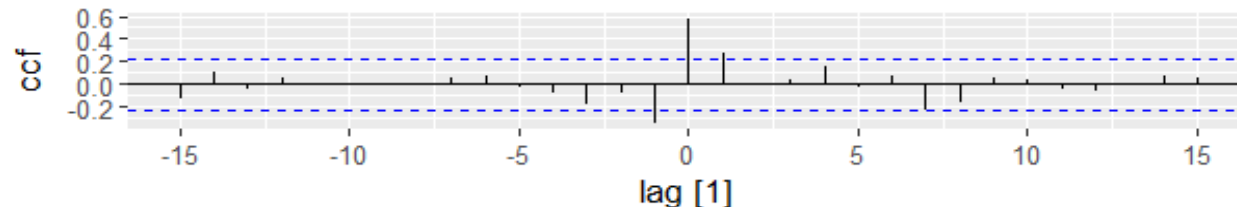
(b) 'Corona' with 'Distance learning'



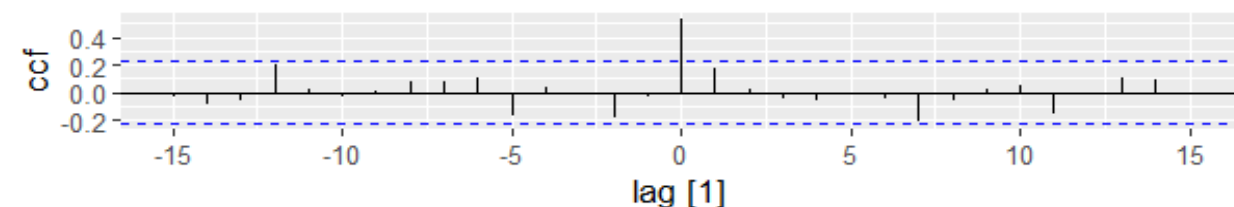
(g) 'Covid' with 'Distance learning'



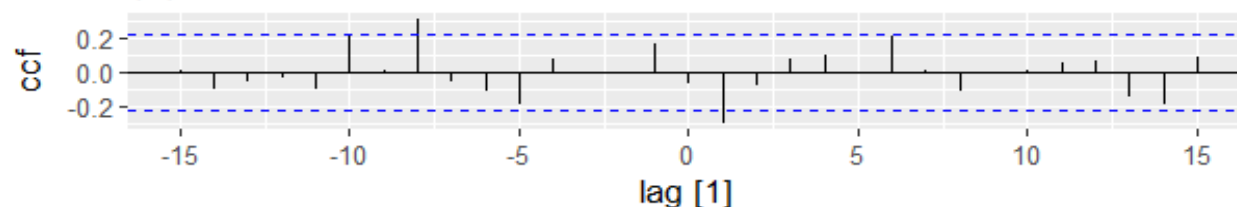
(c) 'Corona' with 'Online teaching'



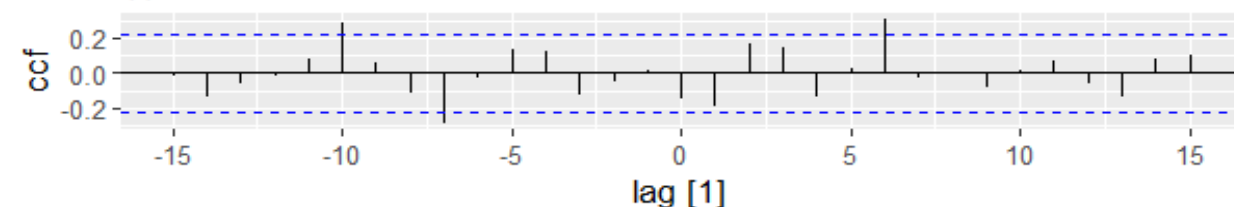
(h) 'Covid' with 'Online teaching'



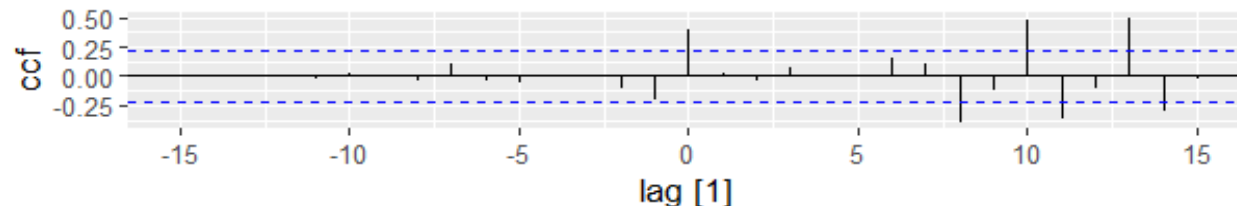
(d) 'Corona' with 'Distance education'



(i) 'Covid' with 'Distance education'



(e) 'Corona' with 'Online proctoring'



(j) 'Covid' with 'Online proctoring'

