

A Systematic Literature Mapping of COVID-19 Papers in Computer Science Education

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Abstract

The COVID-19 pandemic caused many institutions to radically alter the way in which they delivered and evaluated their educational models and frameworks. In the subsequent 3 years, a great deal of research has been conducted in the CS Education community as to the changes that were made and how they impacted learners, educators, and institutions. Building on our existing framework for an interim literature map, this work seeks to provide a systematic and complete mapping of the relevant literature, provid-

ing both a tool for practitioners to easily find and synthesize literature, and the basis for researchers to perform a more detailed literature review. This work represents a systematic search, categorization, refinement, and validation of a literature mapping on three axes: Intervention, Measurement, and Population. An accompanying bibliography and mapping data file is also available for download.

Mapping Protocol

- Initial Query: ‘covid’ OR ‘coronavirus’ OR ‘pandemic’ on the ACM Digital Library - ACM SIGCSE Sponsored Conferences. Returned an initial database of 425 total articles.
- Limiting to research papers measuring covid related intervention in CS context. Reduced to 55 papers.
- All papers double-coded (Cohen’s Kappa: 0.78) Discrepancies settled by group discussion.

Mapping Categories

Intervention:

- Remote Teaching
- Remote Assessment
- Remote Work
- Virtual Event
- General Impact of Pandemic

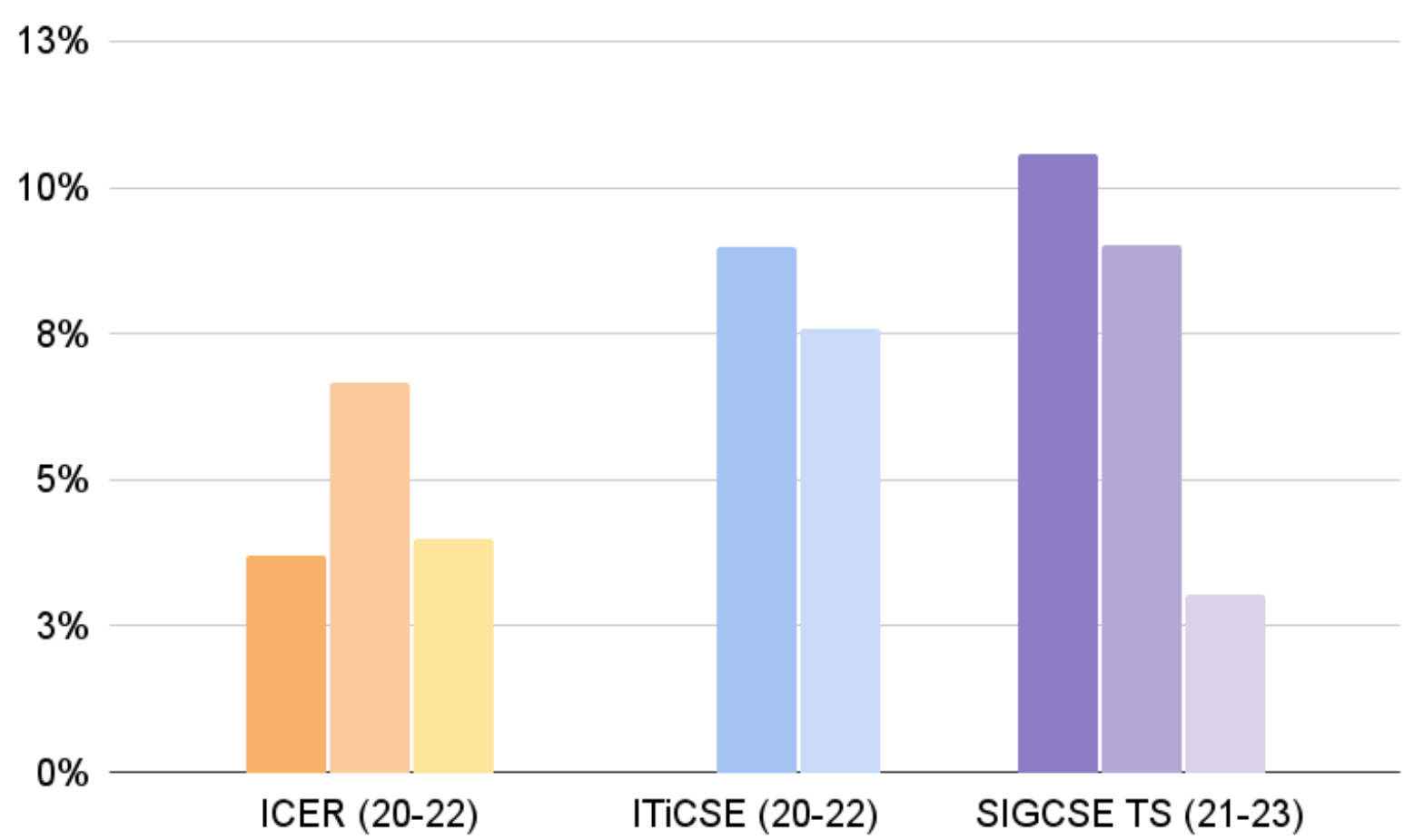
Measurement:

- Grades
- Non-Grade Performance
- Participation (Drop/Fail/Attendance)
- Perceptions (Students’ Preferences, Self Perceptions, Feelings about CS)
- Mental Health

Population:

- Level (K-12/Undergraduate, Introductory)
- Educators
- Gender/Race

Papers by Year



Percentage of COVID Papers by Year

Paper Counts by Category

Interventions vs Measurements

	Grades	Performance	Participa- tion	Perceptions	Mental Health
Remote Teaching	5	0	5	21	1
Remote Assessment	11	1	3	11	1
Remote Work	4	0	3	16	2
Pandemic General	2	1	2	8	3
Virtual Event	1	2	1	4	0

Measurements vs Populations

	K-12	Under- graduate	Introduc- tory	Educators	Gender	Race
Grades	3	12	7	0	0	0
Performance	2	2	2	1	0	0
Participation	3	6	2	0	1	1
Perceptions	10	28	11	3	5	5
Mental Health	0	5	3	0	1	1

Populations vs Interventions

	Remote Teaching	Remote Assessment	Remote Work	Pandemic General	Virtual Event
K-12	9	2	4	1	5
Undergraduate	17	13	16	11	0
Introductory	4	8	5	4	0
Educators	2	0	0	1	2
Gender	2	0	2	2	1
Race	3	0	1	3	1

Findings

- Many papers published late 2021, with steep drop off by mid 2022
- Vast majority of studies were on undergraduate students, with disproportionate focus on CS0/CS1
- Most evaluations were perception based, with simple surveys or questionnaires, or marks based
- Very little focus on gender/race
- Few papers on K-12
- Paper density areas correspond to traditional areas of focus in CS education

Resources

A full PDF mapping, downloadable CSV file and bibliography file are available at:
<https://github.com/BrianHarringtonUTSC/SIGCSE2024CovidLitMap>