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1920 Systems Thinking ST

Cooper, 2010

Brown & Eugene, 1977 Philosophy of Science 1991 NSTB 2025 Research Innovation Enterprise RIE 2023 10 NUS

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COVID-19

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Garrison et al., 1999

Viva La Vida
Koh et al., 2021
NuPOV Nucleophile's Point of View
Augmented Reality AR
QuizBot
Google Onget al., 2021
ChemPOV Chemistry Point of View
Fung et al., 2021
Lim et al., 2017

Platform

Facebook
Line
Supplementary Instruction SI
Moodle
SI
Supplementary Discourse SD
Discord 13 86
Kim et al., 2023

Kahoot!
393
Barr, 2017
Clubhouse
Yep et al., 2023
Cohen's $d = 0.58$
Cohen's $d = 0.21$
Ong et al., 2021

COVID-19
Telegram
Telegram Quiz Bot
Mohan et al., 2021
Telegram Quiz Bot

Method

Didactic Teaching

1800 White et al., 2016

Svinicki & McKeachie, 2014 Bransford et al., 1999 Piaget Brame, 2016

Deslauriers et al., 2019 Theobald et al., 2020 metacognition

COVID-19 10-20% Herbert, 2006

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Case-based learning CBL Herreid, 1997 CBL CBL

Davis (1993) CBL

Lee, 2012 Poll everywhere

Mahaffy et al., 2018 Fung & Watts, 2019

Systems Thinking

Systems Thinking (ST) Mahaffy et al., 2019

Orgill et al., 2019

Self-regulated Learning

Self-regulated Learning (SRL)

Zimmerman, 1986 & 2002) Forethought Phase Performance Phase Self-Reflection Phase

Forethought Phase Performance Phase Self-Reflection Phase

Fung et al., 2022 Parinaz Fathi Agnes Thorarinsdottir COVID-19 Joshua Tropp Fung et al., 2022

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2007

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