

research context
and participants

curriculum focus

purpose

conditions compared

results

Hawkins & Phelps, 2013
work carried out at a "regional
comprehensive university in the south"
General Chemistry II laboratory (169 of
336 students gave consent for data to be
used)

electrochemistry

to test the efficacy of a virtual lab
as a replacement for the hands-on
laboratory
conceptual and factual
understanding were collected as
well as a post-test hands-on setup
of an electrochemical cell.

simulations (experimental
group) (n=84)
versus
standard hands-on
laboratory (control group)
(n=85)

**no significant
differences**

*conceptual question:
is 'refutation' potentially possible?*

*empirical
question:
did
refutation
occur?*

Watson et al, 2020
from University of Houston – Clear Lake
A purposeful sample of 59 Chemistry II
undergraduate students (all gave consent)

pH, acids & bases

whether or not the use of a
collaborative pH computer
simulation had an impact on the
pH knowledge (ability to solve
standard problems), confidence,
and conceptual understanding

collaborative pH computer
simulation activity (n=23)
versus
traditional reading- based
classroom assignments
(n=36)

**no significant
differences**