

REDUCING BIAS AND PROMOTING EQUITY THROUGH A SIMULATED TEACHING ENVIRONMENT



Rhonda Christensen
Gerald Knezek
University of North Texas
Stacy Kruse
Pragmatic Solutions

Interactive Session presented at ISTE June 2024

BACKGROUND

- Baidee (2012) identified four advantages to simulation based learning
 - Classroom decision-making
 - Practice through repeating, receiving feedback and advice
 - Self-efficacy in classroom teaching
 - Collaborations and social interactions
- Simulations allow educators to act within virtual environments, immediately applying theory to realistic, yet controlled, settings (Fischler, 2006)

SIMEQUITY PROJECT: PURPOSE

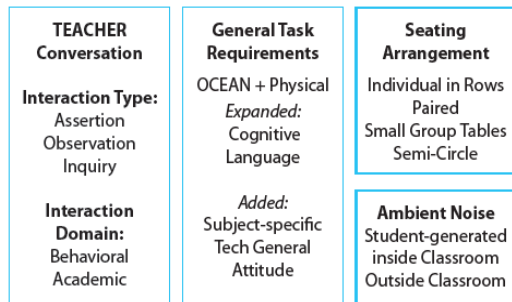
- Implicit bias impacts teaching and learning.
- A typical teacher makes up to 3,000 important decisions during a day of instruction (Danielson, 1996).
- Being a culturally responsive educator first requires recognition of existing or potential bias, a metacognitive skill of teaching.
- Digital simulations in education can support teaching and learning.
- **The simEquity project, using simSchool, focuses on helping educators recognize, reflect on and reduce implicit bias that may exist.**

ABOUT SIMSCHOOL



SIMSCHOOL

- A dynamic, online classroom simulation program that allows preservice and inservice teachers the opportunity to practice teaching
- Promotes pedagogical expertise by re-creating the complexities of classroom decisions through mathematical representations of how people learn and what teachers do when teaching.
- Computational Model (COVE)
 - **C**ognitive science models
 - **O**CEAN model of psychology (Big 5 personality: extroversion, agreeableness, persistence, emotional stability and intellectual openness)
 - **V**iseral layer of Visual-Auditory-Kinesthetic perception
 - **E**nvironment (social and physical expectations) for learning



Internal Influences

Character Profile

STATE Characteristics

Cognitive:

General Ability
 General Language Capacity
 + Expanded Language
 + Subject-Specific

Emotional:

OCEAN + Attitude +
 Social Proximity Impact

TRAIT

Physical Characteristics:

VAK + Motor Skills +
 General Health



Data Generated

Visual Indicators

Expanded:

Facial Expressions
 Body Positions incl. Stimming
 Hand raised when
 cognitive and/or emotional
 threshold hit

Audio Indicators

General Ambient Noise

Distraction Indicator:
 Student Chatter +
 Ambient Increase
 influenced by average
 class distraction level

Data Visible During Play

Student Dashboard

Rate of Learning
 Zone of Proximal
 Development
 Modified OCEAN

Attitude
 Social Impact w/
 Student Influencers

Change Log
 influenced by
 emotional and
 cognitive threshold

Class Dashboard

Average:

Rate of Learning
 Task Differentiation
 Performance
 Emotional Distraction
 Conversation Type
 Attitude toward
 Subject

Lesson Plan Dashboard for:

Task Descriptions
 Tasks used in Order
 Visual indicator of
 +/- average impact

Learning Characteristics in simSchool

Catalog of Modules for Various Topics and Grade Levels



= Grade Level of Students



= Contains Additional Resources



= Estimated Time to Complete

	Module Name	Description		
K-5	Mastering Inclusionary Practices Elementary	Practices Explore classroom management and accommodations	x	1.5 HRS
K-5	Strategies, Accommodations, and Learning Tools	Working with a Variety of Student Learning Devices	x	2 HRS
9-12	Differentiated Instruction Secondary	Practice teaching students who learn best through different modalities	x	2 HRS
9-12	Differentiated Instruction Secondary	Practice teaching students who learn best through different modalities	x	2 HRS
9-12	Exceptionalities and Student Success, Part 3	Experience instructing students with challenges in math processing	x	1.5 HRS
9-12	Exceptionalities and Student Success, Part 5	Experience instructing students on the Spectrum	x	1.5 HRS
9-12	Mastering Inclusionary Practices Secondary	Explore classroom management and accommodations	x	1.5 HRS
9-12	Study Skills Intervention	Teach a high school class where all students have IEPs 4 • 60 min	x	2 HRS

Module Overview >

Teaching Sims >

Observations >

Reflection Questions

Instructions

In this lesson, students explore the varied work of scientists, technologists, engineers and mathematicians, and discuss character traits common to all of them. Students meet a diverse group of scientists—inventors, problem-solvers and those who explain the world around us.

OBJECTIVES

- Students will identify careers that are possible with a background in STEM.
- Students will identify characteristics of a diverse group of people who are successful in STEM.

Enduring Understandings:

- STEM careers consist of many diverse types of work.
- Despite their diverse backgrounds, scientists have similar traits, such as curiosity, perseverance and the ability to solve problems.

ESSENTIAL QUESTIONS

- What work do scientists do?
- What qualities or skills do scientists have in common?

1. Spend approximately 5 minutes presenting Introduction activities to students.
2. Expect that in a live classroom, giving proper time to complete all Instruction Tasks might require 30 minutes. In simSchool, for the purpose of seeing how your diverse students respond to the expectations of the activities in the Learning Plan, it's okay to spend less time. Do make sure that you allow students to work in groups and independently so that you can observe their performance and respond to their specific needs.
3. Spend approximately 5 minutes presenting Closing activities to students.

Resources



class profile



class
instructions



6 8 stem at
work.pdf



(6-8) STEM at Work

Module Overview >

Teaching Sims v

- Class 1: (6-8) STEM at Work
- Class 2: (6-8) STEM at Work 2
- Class 3: (6-8) STEM at Work 3
- Class 4: (6-8) STEM at Work 4
- Class 5: (6-8) STEM at Work 5

Observations >

Reflection Questions

Teaching Sims

Instructions: You must review your observation report for each class taught for the next class to unlock. You must also review your report for each class before you can answer reflection questions if they are present.

Class 1 simEquity Yr. 3	Class 2 simEquity Yr. 3	Class 3 simEquity Yr. 3	Class 4 simEquity Yr. 3	Class 5 simEquity Yr. 3
				
Start Teaching!	LOCKED	LOCKED	LOCKED	LOCKED

ProfileTeachTalkProgressLogs

Click on a student to view progress



Robert Blackwell
He is working on...
Now is your chance to share. You may speak with other students at

StartDone

Robert's Strengths

Reading	Moderate
Writing	Low
Listening	Moderate
Speaking	Moderate
Math	Moderate
Technology	Moderate
PE	Low
Art	Moderate

Key Personality Details

Preferred pronoun:He

Has an IEP Plan:No

Has a 504 Plan:Yes

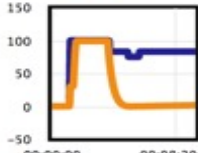
Social Traits:Does fine working with people or alone [\[see more\]](#)

Work Habits:Usually open to and motivated by working with others [\[see more\]](#)

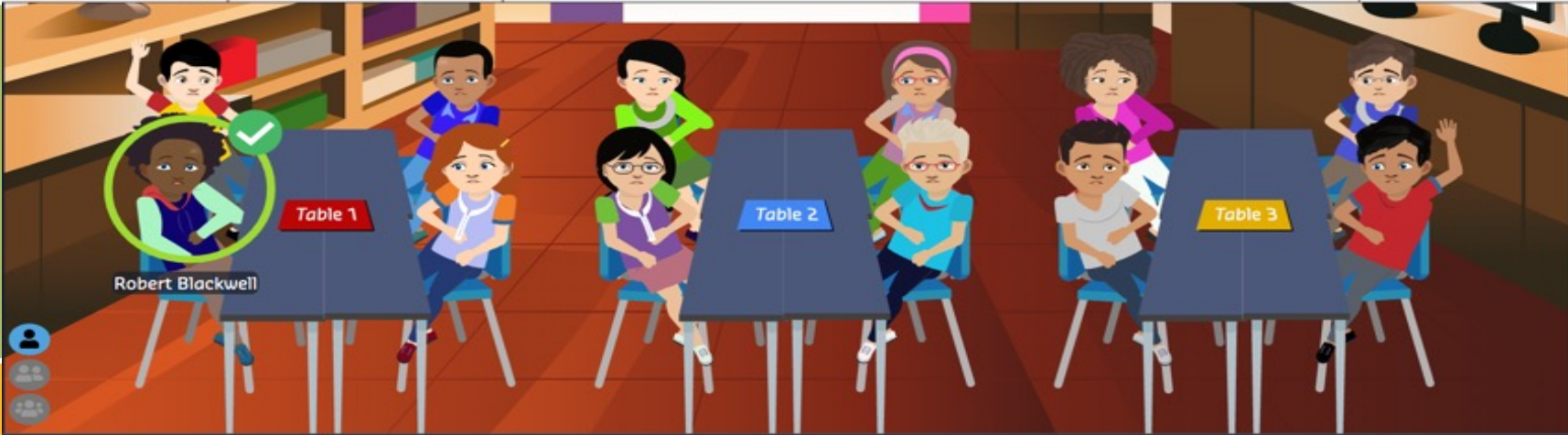
Learning Environment:Either working alone or with others [\[see more\]](#)

Academic Performance

ClassroomStudent



Time Elapsed



Robert Blackwell

Table 1Table 2Table 3

RESTART

00:09:41

PAUSESUBMIT

Task Academic and Social Requirement

Teaching Sims

Admin Feature: Open Sim AI Dashboard

Profile Teach Talk Progress Logs

Tips

<< Back to List

✓ If you wanted something to change at your school, in your community, or in society, how might you go about changing it? How could music help in this way? What role do you think music can play in inciting change? Discuss at your tables.

Class Group To Brandon ASSIGN

Level of Academic Difficulty:

Social Requirement:

Tools Used:

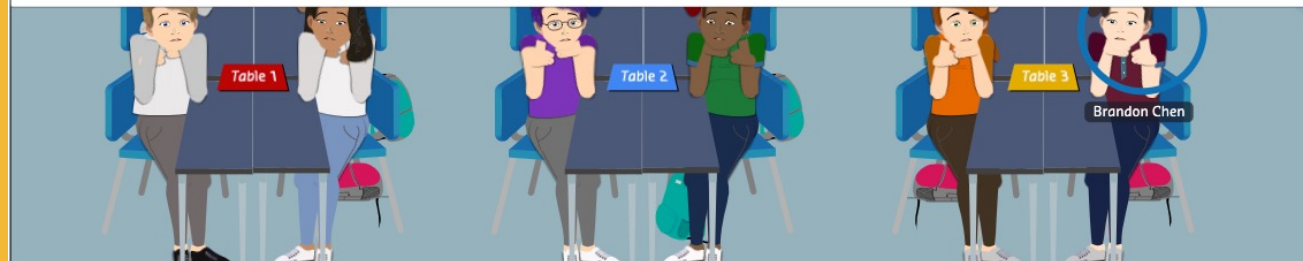
- none

Student Direction of Focus:

- toward peers

Resources:

- na



Benchmarks

1. Regularly assess individual and group performance.
2. Designs, adapts and delivers instruction to address each student's diverse learning strengths and needs and creates opportunities for students to demonstrate their learning in different ways.
3. Makes appropriate and timely provisions for individual students with particular learning differences and needs.
4. Understands students with exceptional needs, including those associated with disabilities and giftedness, and knows how to use strategies and resources to address these needs.
5. Gives students adequate time to transition between instructional activities.
6. Uses praise and encourages positive behavior.
7. Demonstrates fair and equitable practices for students of varied genders, appearances, cultures and learning needs.
8. Use proximity control while students are working on tasks to help them in maintaining engagement.
9. Pacing maintains student involvement and engagement.
10. The teacher brings multiple perspectives to the discussion of content, including attention to learners' personal family and community experiences and cultural norms.
11. The teacher communicates verbally and nonverbally in ways that demonstrate respect for and responsiveness to the cultural backgrounds and differing perspectives learners bring to the learning environment.
12. The teacher develops and implements supports for learner literacy development across content areas.
13. The teacher develops appropriate sequencing of learning experiences and provides multiple ways to demonstrate knowledge and skill.
14. Use the appropriate tasks for any student indicated as ELL/IEP/504.
15. Use eye contact with high-achieving and low-achieving students.

SIMSCHOOL FEEDBACK

Benchmarks

Class 1 Report					
Description	N/A	Needs Attention	Satisfactory	Good	Feedback
1 Regularly assesses individual and group performance.			✓		You checked the class progress 2 times, or approximately once every 8 minute(s). More Detail
2 Designs, adapts, and delivers instructions to address each student's diverse learning strengths and needs and creates opportunities for students to demonstrate their learning in different ways.				✓	You used 5 tasks from the lesson plan. More Detail
3 Makes appropriate and timely provisions for individual students with particular learning differences and needs.			✓		Students spent 47% of their time in the mid performing band. More Detail
4 Understands students with exceptional needs, including those associated with disabilities and giftedness, and knows how to use strategies and resources to address these needs.			✓		Of 8 students requiring accommodations, you provided accommodations for 5 of them. More Detail
5 Gives students adequate time to transition between instructional activities.			✓		You gave some form of a break before 40% of assigned tasks. More Detail
6 Uses praise and encourages positive behavior			✓		You gave praise 2 times, or approximately once every 8 minutes. More Detail

Report Item Criteria

More detailed feedback on each benchmark

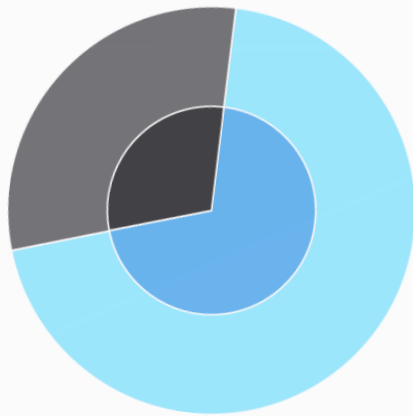
Use the accommodations indicated as appropriate for students having IEP plans, 504 plans, or indicated as English Language Learners on their simStudents profiles if the students decline in academic or emotional performance. Using no accommodations for any students will result in a "needs attention" observation. Using correct accommodations for 1-2 students will result in "satisfactory". Using at least one correct accommodation for all students will result in "good".

Close

Graphic Feedback

Student Attention By Gender

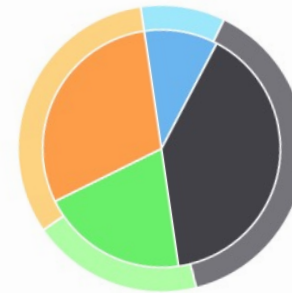
'Attention' determined by speaking to a student, looking at a student's profile, assigning a differentiated task, applying a differentiated strategy, or zooming in on a student.



- attention received by female students
- female students in classroom
- attention received by male students
- male students in classroom

Student Attention By Ethnicity

'Attention' determined by speaking to a student, looking at a student's profile, assigning a differentiated task, applying a differentiated strategy, or zooming in on a student.



- attention received by black or african american students
- attention received by hispanic or latino or of spanish origin students
- attention received by unspecified students
- attention received by white students
- black or african american students in classroom
- hispanic or latino or of spanish origin students in classroom
- unspecified students in classroom
- white students in classroom

Methodology: Data Collection

- Teacher Surveys
 - The *Teachers' Sense of Efficacy Scale* (TSES) short form (Tschannen-Moran & Hoy, 2001)
 - The *Culturally Responsive Self-Efficacy Survey* (Siwatu, 2007)
 - *Educator Bias Inventory* (Collum et al., 2020) (*Self-Awareness, Pedagogical environment, and Relationships with families and community*)
- Simulation-Generated Data
 - Academic Index
 - Emotional Index
 - Equality/Equity Index
 - Survey rating predicting success – avatars/names

SELF REPORT DATA

- Teacher Data
 - Teachers' Sense of Self-Efficacy Scale
 - Culturally Responsive Teaching Survey
 - Educator Bias Inventory
- Student Data
 - Voice about school
 - Voice about influence
 - Cultural Engagement of their Teachers
 - Diverse Teaching Practices of their Teachers
 - Student Engagement

RESEARCH FINDINGS – VERY BRIEF

- Teachers
 - Significant ($p < .05$) positive changes pre to post for efficacy related to instructional practices as well as culturally responsive teaching practices
 - Within the simulator data, labeling simulated students as having special learning needs results in classroom teachers paying increased, targeted attention to these students.
- Students of participating teachers
 - pre-post significant ($p < .05$) differences were found for students for Voice Having Influence, Student Engagement, and Diverse Teaching Practices (of their teachers)
 - significant ($p < .05$) differences between males and female students on at pretest time (Voice Having Influence and Student Engagement) with males being significantly higher. By posttest, the differences between males and females were no longer significant ($p < .05$)

DEMONSTRATION: SIMSCHOOL

- Brief introduction (videos are provided for anyone using the system)
- Walk-through of simulation
- Planning process
- Login and complete modules

IMPLEMENTATION STRATEGIES

For this free module, recommend having students complete it and upload or email the pdf of their results for credit.

If using complete simSchool system, the modules can be used in a specific class only or used throughout the program.

- Classroom management module

- Differentiated instruction

- Math focused

- Social issues focused

- STEM

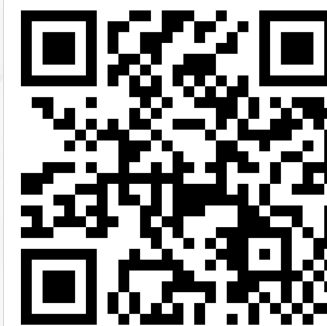
TRY IT!

Virtual teaching. Real results.

Made possible through funding from the National Science Foundation (NSF grant number 2118849), simsSchool simEquity™ Modules are available for FREE Spring 2024 - Fall 2025. Register now to begin teaching, reflecting, and improving equitable practices.



REGISTER NOW



Scan me!

<https://west.simschool.org/home/simschool#simequityreg>

**SIMULATION PD
OPPORTUNITY:
SPACE LIMITED
\$400
STIPEND PAID**

- Sign Up:
<https://tinyurl.com/simequitysignup>

THANK YOU!

Rhonda Christensen
Rhonda.Christensen@unt.edu

Gerald Knezek
gknezek@gmail.com

Stacy Kruse
stacy@pr-sol.com



NSF grant #2118849

Presentation Template: [SlidesMania](http://slidesmania.com)

Sample Images: [Unsplash](https://unsplash.com)

Fonts used in this presentation: Andika and
LUCKIEST GUY



Free themes and templates for
Google Slides or **PowerPoint**

NOT to be sold as is or modified!

Read [FAQ](#) on slidesmania.com

Do not remove the slidesmania.com text on the sides.

Sharing is caring!

