Real learning, simulation lessons: The impact of historical simulations on student intrinsic motivation

Travis G. Petty
St. Mary's College of Maryland

Abstract: Addressing the achievement gap in education is essential. To do so, students need to be more engaged in the classroom. Student engagement can potentially be increased by improving how much students enjoy their lessons as well as creating more active lessons that require increased student engagement. To address this, I used a historical simulation and observed the changes in student intrinsic motivation and behavioral engagement. Students showed a statistically significant increase in both following the simulation. Historical simulations have the potential to improve student learning by actively engaging them more while creating a more enjoyable learning environment.

Introduction and Justification

Simulations, as a pedagogical tool, have the potential to engage students in meaningful critical thinking activities that can directly emphasize literacy skills and an empathetic approach to history (Wright-Maley, 20x15; Wright-Maley & Joshi, 2017). The purpose of this study was to determine the effectiveness of historical simulations on students' engagement and their attitudes towards history. Student engagement and attitudes can play a large role in their content acquisition and overall enjoyment of social studies as a subject (McCall, 2012; Robinson, 2013).

Engagement and attitudes toward an area of content are vital components of an effective learning environment (Terzi, 2020). This includes the social studies classroom (McCall, 2012; Robinson, 2013). Researchers from the National Survey of Student Engagement found that student engagement had declined during and following the COVID-19 pandemic (2021). Outside of the occasional history buff, students are less likely to be engaged in social studies classes than was the case in pre-pandemic years. Finn (1993) reported that student engagement plays a pivotal role in student achievement. This decline in engagement can be a detriment to positive learning experiences and effective method of reengaging students is an important consideration.

One way to combat a lack of engagement in social studies is the use of simulations (McCall, 2012; Robinson, 2013). Wright-Maley (2015) defined a simulation as a pedagogical tool that "reflect reality in a structured and limited way [verisimilitude]; . . . illustrate significant dynamic events, processes or phenomena [dynamism];. . . incorporate learners in active roles through which phenomena are revealed [participation]; . . . are pedagogically mediated [pedagogical mediation]" (p. 67). The use of various simulation methods such as role-playing, reenactment, and participatory lessons may engage students in meaningful

and empathetic ways (Wright-Maley & Joshi, 2017). Engagement is essential for the understanding of historical content and the development of critical historical skills (Ghere, 2001). Additionally, students' attitudes towards a subject matter have an impact on their achievement. Ellis (1994) found that students who had poor attitudes towards psychotherapy treatment were less likely to perform well and benefit from the sessions.

The school involved in this study is both rural and highly diverse. One of the main goals of the pre-existing School Improvement Plan (SIP) is to improve the achievement of students identified as economically disadvantaged. Over half of the students that made up the sample of this study were identified as such. Love (2019) argued that students who are economically disadvantaged, especially students of color, are often unsupported in their education and are a critical learning population. Improving the educational experiences of disadvantaged students is vital to closing the achievement gap (Boykin & Noguera, 2013).

Literature Review

Active Learning Through Simulations

Active learning includes any learning activity in which students are required to be active and think about what they are doing (Bonwell & Ellison, 1991). Active learning has the potential to improve student engagement and enjoyment in the classroom (Groccia & Miller, 2005). The influence of active learning on student's behavioral engagement has been documented in a variety of content areas, including social studies (Gehlbach et al., 2008; Ghere, 2001; Kvam, 2000; McCarthy & Anderson; 2000). Students tend to find active learning more enjoyable than more passive forms of instruction, leading to increased intrinsic motivation (Ghere, 2001; Miner, 1977; Reid et al., 2012).

Many educational researchers have explicitly identified simulations as a form of active learning (Kvam, 2000; McCarthy & Anderson, 2000). Simulations are any activity that reproduces a real-world situation in a controlled environment that allows for student choice in the activity (Wright-Maley, 2015). Although much scholarly effort has been devoted to the definition, methodology, and potential efficacy of simulations in social studies, little actionable research has been conducted on the subject. Alternatively, the effectiveness of simulations in medical, engineering, and business education is robust and has shown positive effects on student achievement that may be applicable to social studies classrooms. Namely, researchers have found that simulations in these other contexts are often more engaging and enjoyable than passive instruction and have had positive effects on student achievement (Kvam, 2000; Reid et al., 2012).

Interest in Social Studies

Coombe et al. (2018) reported that students in the U.S. find social studies to be their least favorite subject after world languages. This is concerning because interest or enjoyment of a subject reflects students' levels of intrinsic motivation, which is vital to academic success. Gehlbach et al. (2008) argued that a lack of active learning in social

studies classrooms can lead to a decrease in intrinsic motivation. Alternatively, Gehlbach et al. (2008) found that historical simulations led to increases in students' social perspective taking and interest in social studies. As students participate in activities that require them to take the perspective of other people, historical or otherwise, they find the material more enjoyable and applicable to their own lives (Gehlbach et al., 2008).

Present Study

The purpose of this study was to investigate whether implementing historical simulations could increase eighth grade students' intrinsic motivation and behavioral engagement. More precisely, I explored how historical simulation activities changed students' interest and enjoyment in social studies. I also explored what students found enjoyable or not enjoyable during the activity. The research questions that guided this investigation were:

1. To what extent, if any, do historical simulations improve students'
    a. behavioral engagement and
    b. intrinsic motivation?
2. What do students report liking or not liking about historical simulations?

Methods

Sample

The sample is composed of 8th grade social studies students in a rural, multicultural school. In total, there are 145 students, 93 of whom are identified as economically disadvantaged. The sex demographics are nearly even, with 73 females and 72 males. There are 60 Black students, 47 White students, 16 Hispanic students, 16 multi-racial students, four Asian students, and two American Indian/Alaska Native students. 12 of the students have been identified as having disabilities.

Action Strategy

My action strategy used historical simulations to teach differences between the experience of artisan and factory workers. Eighth grade students from a variety of backgrounds participated in a simulation of artisan craftsmanship versus factory manufacturing to better understand the American industrial expansion of the mid-1800s. The artisan crafts-people were given the best tools to create their snowflakes while the factory workers were given an exact rules sheet and poorer quality tools to create as many snowflakes as possible. The students who were not actively involved recorded notes on the process and outcomes. After the first simulation, the observing students performed the simulation while the former performers observed.

Data Collection

Students were given a pre-intervention and post-intervention survey to self-report their enjoyment of social studies and their own behavioral engagement. Behavioral engagement was measured by adapting Deci et al. (2010)'s Behavioral Engagement Scale to include the term "social studies." To measure students' intrinsic motivation in social studies, I similarly adapted the Interest/Enjoyment subscale of Ryan and Deci (2000)'s Intrinsic Motivation Inventory. The items from these scales were measured in a Likert-type scale of 1 ("Not at all true") to 7 ("extremely true"). To provide additional evidence of behavioral engagement, my mentor teacher used a behavioral checklist to tally students' on-task and off-task behaviors both before and after the intervention. I also recorded field notes to further examine students' changes in behavioral engagement. Finally, students responded to an open-ended survey regarding the extent to which they enjoyed the simulation.

Table 1:

Research Questions and Data Sources

	Data source 1	Data source 2	Data source 3
To what extent do simulation activities improve students' behavioral engagement?	Behavioral Checklist (pre-intervention and post-intervention)	Behavioral Engagement Scale adapted from Deci et al. (2010) (pre-intervention and post-intervention)	Field Notes
To what extent do simulation activities improve students' intrinsic motivation?	Interest/Enjoyment Scale adapted from Ryan and Deci's (2000) Intrinsic Motivation Inventory		
What do students report enjoying or not enjoying about historical simulation activities?	Open-Ended Survey Item		

Data Analysis

The checklist data and Likert-type survey data were analyzed using paired *t*-tests. Cohen's *d* was used to calculate the effect size. The qualitative data derived from the open-ended survey item was first coded for positive and negative interest, and second-level coding was used to explore patterns that emerge in the reasons students enjoy or do not enjoy historical simulation activities.

Validity Concerns

To ensure validity, I have used scales for behavioral engagement and enjoyment that have previously been validated (Deci et al., 2010; Ryan & Deci, 2000). Additionally, I evaluated behavioral engagement in several ways, providing some evidence of convergent validity. The behavioral checklist was used by an outside observer and includes objective behavioral criteria to reduce any effect of bias. Selected sections of qualitative data were coded by additional raters and compared with my own to examine intercoder reliability.

Results

Behavioral Engagement

The data from the behavioral engagement checklist can be found in Table 2. All present students were measured on the behavioral engagement checklist. Of the behaviors recorded (n=115) in pre-intervention, there were 64 off-task behaviors and 51 on-task behaviors. During the intervention (n=126) 47 off-task behaviors and 79 on-task behaviors were observed. On-task behaviors made up roughly 9.5% more of the total behaviors during the intervention, whereas off-task behaviors were recorded 18.3% more during the pre-intervention lesson. A two tailed t-test revealed a statistically significant (p=0.004) increase in on-task behaviors. The effect size (d=.38) was small, likely due to the restraints on time for data collection.

Table 2:

Pretest and Posttest On-Task Behavior Averages

	n	*M*	SD	*p*	*Effect (d)*
Pre	115	.44	.5	.004	.38
Post	126	.63	.49		

Students self-reported their own behavioral engagement using a likert-type behavioral engagement scale adapted from Deci et al. (2010). The data from this scale can be found in Table 3. Students ratings for behavioral engagement rose from the pretest (M=4.3) to the posttest (M=4.6). This increase in ratings for students' behavioral engagement was statistically significant (p=.01). Again the effect size was small (d=.37), likely due to the time-constraints.

Based on the students' behavioral engagement ratings (p=.004) as well as the behavioral engagement checklist (p=.01), students behavioral engagement improved during the intervention. From my own observational notes, students were actively engaged with both their factorial or artisan tasks and their observations of their fellow classmates. Students mostly remained respectful and on-task during the simulation.

Table 3:

Pretest and Posttest Behavioral Engagement Scale Ratings

Real Learning, Simulation Lessons

	n	*M*	SD	*p*	*Effect (d)*
Pre	91	4.3	.9	.01	.37
Post	96	4.6	.98		

Intrinsic Motivation

Behavioral engagement was measured using a student-reported questionnaire and a likert-type interest/enjoyment scale adapted from Ryan and Deci's (2000) intrinsic motivation inventory. The data from the scale can be found in Table 4. Student ratings for interest in social studies increased from the pretest (*M*=2.2) to the posttest (*M*=2.7). This increase in student ratings was statistically significant (*p*=.0008). The change in interest had a medium effect size (.49).

Table 4:

Pretest and Posttest Interest/Enjoyment Scale Ratings

	n	*M*	SD	*p*	*Effect (d)*
Pre	91	2.2	.96	.0008	.49
Post	96	2.7	.93		

In the questionnaire, students (*n*=96) were asked what they did or did not enjoy during the lesson. Students reported enjoying the collaborative and competitive aspects of the simulation, but some reported not enjoying the classroom excitement. When coding student responses, words like "teamwork" and "game" were reported as aspects of the simulation that were enjoyed. Student enjoyment of collaboration and competition showed up in over half of the responses. Nine (9.3%) responses, students reported not enjoying the increased excitement in the classroom. Sixty-six (68.8%) of the students reported enjoying the lesson in total, corroborating the increase in interest ratings from the interest/enjoyment scale (Table 4).

Discussion of Results

In all, students showed statistically significant improvements in both behavioral engagement and intrinsic motivation during the intervention. Groccia and Miller (2005) asserted that active learning influenced students' behavioral engagement. My own field notes, the behavioral engagement checklist, and the student-reported engagement scale corroborated that historical simulations may have a positive impact on behavioral engagement. McCall (2012) and Robinson (2013) also argued that simulations could have a positive effect on students' intrinsic motivation in a classroom. Analysis of the student questionnaire and the interest/enjoyment scale additionally corroborated that historical simulations may positively influence students' interest in social studies.

Conclusions and Implication

In my research, I found similar success with historical simulations in the classroom as Groccia and Miller (2005) did in their study of active learning. I found that students enjoyed and were more engaged in the simulation than in traditional lecture style lessons. Additionally, my observation of students showed an increase in historical empathy and critical thinking skills similar to the findings of Bonwell and Ellison (1991).

Wright-Maley's (2015) framework of historical simulations was a benefit when designing the simulation. By ensuring fair rules, verisimilitude, competition, and collaboration, the simulation was a more positive experience for the students than traditional lectures. Additionally, Wright-Maley (2015) more concretely defined historical simulation to the benefit of this research.

Ultimately, students reported and were observed to have statistically significant changes in their behavioral engagement and intrinsic motivation. This study corroborated former studies and theories that supported the benefits of historical simulations (see Gehlbach et al., 2008; Ghere, 2001; McCarthy & Anderson, 2000; Miner, 1997; Wright-Maley, 2015; Wright-Maley & Joshi, 2017) as well as active learning in other academic disciplines (see Bonwell & Eison, 1991; Kvam, 2000; Reid & Tabibzadeh, 2012).

Limitations

Due to the time constraints and limited sample size of this research the effect size of the changes to students' behavioral engagement (d=.38, d=.37) and intrinsic motivation (d=.49) might not have been observed to their most accurate extent. While the effect sizes were low and medium respectively, other research suggest a larger effect size potential (Gehlbach et al., 2008; Ghere, 2001; McCarthy & Anderson, 2000; Miner, 1997; Wright-Maley, 2015; Wright-Maley & Joshi, 2017).

Implications

Additional research without constraints may find a larger effect on behavioral engagement and intrinsic motivation. Regardless, students in general found the simulation more engaging and enjoyable than traditional classroom lectures. I found that historical simulations has the potential to combat the decrease in student enjoyment of social studies (Coombe et al., 2018), the achievement gap (Boykin & Noguera, 2013), and address racial disparities in the classroom (Love, 2020). I intend to use historical simulations in my classroom and to continue to study its potential.

References

Bonwell, C., & Eison J. (1991). Active learning: Creating excitement in the classroom. *ASH-ERIC Higher Education Reports.* https://files.eric.ed.gov/fulltext/ED336049.pdf

Boykin, A., & Noguera, P. (2013). *Creating the opportunity to learn: Moving from research to practice to close the Achievement Gap.* Pearson.

Coombe et al. (2018). The 2018 Cambridge international global education census.

Cambridge International. https://www.cambridgeinternational.org/about-us/edcensus/

Deci, E., & Ryan, R. (2012). Self-determination theory. *Handbook of theories of social psychology* (pp. 416–436). https://doi.org/10.4135/9781446249215.n21

Ellis, A. (1994). *Reason and emotion in psychotherapy*. New York: Birch Lane Press.

Finn, J. (1993). *School engagement & students at risk.* National Center for Educational Statistics. https://eric.ed.gov/?id=ED362322

Gehlbach, H., Brown, S. W., Ioannou, A., Boyer, M. A., Hudson, N., Niv-Solomon, A., & Janik, L. (2008). Increasing interest in social studies: Social perspective taking and self-efficacy in stimulating simulations. *Contemporary Educational Psychology*, *33*(4), 894-914. http:// dx.doi.org/10.1016/j.cedpsych.2007.11.002

Ghere, D. L. (2001). "You are members of a United Nation Commission…": Recent world crises simulations. *Teaching History, 103,* 22-25. https://search.ebscohost.com/login.aspx?direct=true&db=edsjsr&AN=edsjsr.43260403&site=eds-live

Kvam, P. (2000). The effect of active learning on student retention in engineering statistics. *The American Statistician, 54(2)*, 136-140. https://doi.org/10.2307/2686032

Love, B. (2020). *We want to do more than survive: Abolitionist teaching and the pursuit of educational freedom.* Beacon.

McCall, J. (2012). Navigating the Problem Space: The Medium of Simulation Games in the Teaching of History. *The History Teacher*, *46*(1), 9–28. http://www.jstor.org/stable/43264070

McCarthy, J. P., & Anderson, L. (2000). Active learning techniques versus traditional teaching styles: Two experiments from history and political science. *Innovative Higher Education, 24*(4), 279-294.

Miner, N. R. (1977). Simulation and Role-Playing in the Teaching of East Asian History. *The History Teacher*, *10*(2), 221-228. https://www.jstor.org/stable/491266

NSSE. (2021). *The pandemic and student engagement: Trends, disparities, and opportunities.* National Survey of Student Engagement. https://nsse.indiana.edu/research/annual-results/2021/story1.html

Reid, M., Brown, S., & Tabibzadeh, K. (2012). Capstone teaching models: Combining simulation, analytical intuitive learning processes, history and effectiveness. *Journal of Education for Business*, *87*(3), 178-184. https://doi.org/10.1080/08832323.2011.586006

Robison, W. B. (2013). Stimulation, Not Simulation: An Alternate Approach to History Teaching Games. *The History Teacher*, *46*(4), 577–588. http://www.jstor.org/stable/43264159

Ryan, R., & Deci, E. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*, 54-67. https://doi.org/10.1006/ceps.1999.1020

Terzi, R. (2020). The impact of understanding learners and techno-pedagogical competency on effective learning environments by designing the instructional process*. Turkish Journal of Education, 9*(3), 246-259. https://eric.ed.gov/?id=EJ1286278

Wright-Maley, C. (2015). What every Social Studies teacher should know about simulations. *Canadian Social Studies*, *48*(1), 8-23. https://files.eric.ed.gov/fulltext/EJ1087180.pdf

Wright-Maley, C., & Joshi, P. (2017). All fall down: Simulating the spread of the Black Plague in the high school History classroom. *The History Teacher*, *50*(4), 517–534. https://www.jstor.org/stable/44507272

Appendix

Appendix A

Pre/Post Behavioral Engagement Checklist

Student	**On Task**	**Off Task**

	Raising hand	Appropr i ately talking to other students	Physically working on the assigned task	Out of seat inappropri ately	Talking at an inappropria te time	Using computer inappropriat ely

Appendix B

[Pre-test] Student Individual Self-Report Engagement (Deci et al., 2010)

During this social studies I pay attention.

1 2 3 4 5 6 7

Not at all true Extremely true

I did not try to work hard during social studies. (R)

1 2 3 4 5 6 7

Not at all true Extremely true

During social studies I tried to learn as much as I could.

1 2 3 4 5 6 7

Not at all true Extremely true

[Pre-test] Interest Enjoyment Subscale (Ryan & Deci, 2000)

I enjoy social studies very much.

1 2 3 4 5 6 7

Not at all true Extremely true

I think social studies is important.

1 2 3 4 5 6 7

Not at all true Extremely true

I think social studies is boring. (R)

1 2 3 4 5 6 7

Not at all true Extremely true

Social studies does not hold my attention at all.(R)

1 2 3 4 5 6 7

Not at all true Extremely true

I would describe this social studies as very interesting.

1 2 3 4 5 6 7

Not at all true Extremely true

I think social studies is quite enjoyable.

1 2 3 4 5 6 7

Not at all true Extremely true

During social studies, I thought about how much I enjoy it.

1 2 3 4 5 6 7

Not at all true Extremely true

Appendix C

[Post-test] Student Individual Self-Report Engagement (Deci et al., 2010)

During this class I paid attention.

1 2 3 4 5 6 7

Not at all true Extremely true

I did not try to work hard on this activity. (R)

1 2 3 4 5 6 7

Not at all true Extremely true

During this activity I tried to learn as much as I could.

1 2 3 4 5 6 7

Not at all true Extremely true

[Post-test] Interest Enjoyment Subscale (Ryan & Deci, 2000)

I enjoyed this activity very much.

1 2 3 4 5 6 7

Not at all true Extremely true

I think this is an important activity.

1 2 3 4 5 6 7

Not at all true Extremely true

I thought this was a boring activity. (R)

1 2 3 4 5 6 7

Not at all true Extremely true

This activity did not hold my attention at all.(R)

1 2 3 4 5 6 7

Not at all true Extremely true

I would describe this activity as very interesting.

1 2 3 4 5 6 7

Not at all true Extremely true

I thought this activity was quite enjoyable.

1 2 3 4 5 6 7

Not at all true Extremely true

While I was doing this activity, I was thinking about how much I enjoyed it.

1 2 3 4 5 6 7

Not at all true Extremely true

Appendix D

Simulation Inquiry Questionnaire

What did you enjoy or not enjoy about today's activity?