Gamification: Impact on Writing with Students with Autism- An Action Research Plan

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Technology has grown significantly, over the past centuries (Mitchell, 2007). We can use the positive change that technology has made to allow more peer-to-peer interactions and hands-on activities through the use of gamification with all students (Thomas and Brown, 2011). The purpose of my study is to see how the integration of a newer technological tool of gamification can be combined with writing strategies to impact individuals with Autism Spectrum Disorder (ASD) writing skill.

Fundamental Research Question

According to Mertler (2019), there are a total of three areas that action research topics come about. The two areas that my topic comes about are in the areas of problem identification and studying a field of my personal interest (Mertler, 2019). Growing up having an ASD, I have found it really difficult and time consuming to complete writing tasks. As a child that had a difficulty communicating her wants and needs verbally, it was even more difficult for me to respond with paper and pencil. According to Mays and Calhouns (2008) study on students with ASD, 65% of these students show evidence of having writing difficulty. There has been limited data on the impact that gamification can have on these students' writing skills. My study will review how gamification can impact learning, and the different techniques that are used to improve writing skills. My fundamental research question for this study will be, "how does gamification impact the writing skills among children with Autism Spectrum Disorder?"

Summary of the Literature Review

There are many characteristics related to gamification and research intervention that have been proven to increase writing among individuals with ASD (Accardo et al., 2019; Asaro-Saddler, 2016; Hunt et al., 2022; Murillo-Zamerno et al., 2021; Pennington et al., 2012;

Stylianidou et al., 2020; Tilli et al., 2022; Zolkipili et al., 2023). As Murillo-Zamerno, et al. (2021) mentions, we can think of the most common characteristics of gamification with points, badges, and leaderboards, and the most beneficial of that intervention being the Self-Regulation Strategy (SRSD) (Accardo et al., 2019; Asaro-Saddler, 2016; Pennington et al., 2012).

There was also lots of research on the benefit of gamification, but limited studies on the barriers of gamification. According to Hunt et al. (2022), within gamification, students can plan, monitor, and reflect, while building an explanation and rephrasing arguments, by seeing and responding to their understanding of the knowledge and skills they are learning. However, gamification has been seen to have technological challenges and challenges to student response when being implemented (Baalsrud Hauge et al., 2016; Demirbilek et al., 2022; Trinidad et al., 2021).

There is a need for further study on the effectiveness of how gamification could positively impact motivation and participation with individuals with ASD in their writing skills. Overall the review suggests that combining gamification with writing tasks may be beneficial among students with ASD .

Study Information

Research Design

When thinking about what research design I was going to use I thought about the frequency that the gamification technique impacts the students' writing. I would also like to use observations that I can get from the head teacher, and existing classroom artifacts showing that writing is a difficulty that the students have. Which led me to taking data on the frequency of how often the technique works and doesn't with the option to be able to take some qualitative data from other observations from others in the classroom and those who have worked with

students with ASD in writing tasks. According to Mertler (2019), there are several types of

research designs depending on what type of data you are going to take. For my action research

project, I am leaning towards using the Triangulation Mixed- Method Design Approach. This

method focuses on the equal use of quantitative and qualitative data (Mertler, 2019). A mixed

design allows you to use both types of data with a main focus on one or both in order to get the

best out of your action research study (Mertler, 2019).

Data Collection and Analysis

The data that I plan to collect that can adequately show how gamification impacts writing

skills among children with ASD is the use of quantitative and qualitative data collection

techniques. The types of quantitative data I will collect will start at the beginning of the action

stage by sending out a questionnaire to other educators who have worked with students with

ASD with questions revolving the observations they have seen with writing tasks among these

students. I use a checklist to collect the data on the behavior that the student exhibits when giving

a writing task while engaging in a type of gamification. I will also use qualitative data techniques

such as existing documents and records to show the need for difficulty among writing tasks with

students with ASD, and use observational notes from the head classroom teacher of the student

completing the tasks.

I will analyze my quantitative data by using descriptive statistics using the measure of

central tendency and my qualitative data by using the constant comparative method. Within my

quantitative data, I will take data using a checklist every day during writing tasks making note on

if the writing task was completed using the gamification task or not. I will then analyze the data

monthly, writing down how many times the tasks were completed using the technique each week

of the month. Following the monthly data analysis, I will be able to find the mean, median, mode

of the monthly data every four months, and repeat this analysis process every month and quarter during my action research study. Within my qualitative data, I will collect my data using observations from the head teacher and the descriptive statistics using the measure of tendency in the classroom. I will then analyze these observations and checklist data to find common themes. I would then continue to take data, and write a paragraph that contributes to condensing the most important ideas (Mertler, 2019).

Research Timeline

Step 1: Planning and Baseline Data (January- April 2024)

1. Create data sheets and Questionnaires for action research study **COMPLETED**

2. Get educators in grades K-5th Permission to Participate in the action research study

    COMPLETED

3. Identify the percentage of educators that have seen a writing difficulty among students with autism that they have worked with

4. Gather the Baseline Data

5. Identify Students with Autism Spectrum Disorder in K-5 at North Iowa

6. Receive Permission From Parents and Guardians to participate in study

Step 2: Intervention and Data Collection (April 2024-December 2024)

1. Create an intervention schedule

2. Meet with students weekly to perform intervention and collected data

3. On the 1st of every month sit down and reflect on Data

    a. April Reflection

    b. April and May Reflection

    c. April, May and August Reflection

  d. April May, August-September Reflection

  e. April, May, August-October Reflection

  f. April, May, August- November Reflection

  g. April, May, August-December Reflection

Step 3: Analyze and Reflection (January 2025-February 2025)

 1. Analyze Data

  a. Themes

  b. Before Summer and After Summer

  c. Teacher Observations

 2. Create a Journal Article on Findings

 3. Share and Communicate Results

Sharing and Communicating Results

   Sharing your results with other educators, administrators, and parents of students who participated in any part of your research process is a very important and ethical step when completing your action research. Keeping these groups of people informed about the process and research going on will allow for the extra strategies and recommendations on how they themselves can help improve the engagement and motivation of all students. Sending out a monthly newsletter and presentation that highlights activities, lessons, data, research reflection, and recommendation of the month's innovation process will guarantee that these groups of individuals are staying up to date with the latest research being done.

Final Reflection

   Throughout the entire Action Research process, I will continue to reflect, journal, and share my data and research that can be crucial to the overall learning environment. This is very

important and something that Mertler (2020) mentions throughout his whole book on Action

Research. Action Research is a continuation of reflections before, during, and after the research

process is over (Mertler 2020). After the research is complete, I will reflect and analyze the data

and characteristics of the study. Reflecting on questions such as what went well, what could have

gone better, were there any limitations within the study, and what were the final takeaways on the

overall research. Finally, I will look at furthering my research, and how I could look at the

impact that gamification has on other diverse learning groups or what other Universal Design for

Learners approach techniques can help individuals with Autism be successful in their academics

and post graduation endeavors.

References

Accardo, A. L., Finnegan, E. G., Kuder, S. J., & Bomgardner, E. M. (2020). Writing

Interventions for Individuals with Autism Spectrum Disorder: A Research Synthesis.

Journal of Autism & Developmental Disorders, *50*(6), 1988–2006.

https://doi-org.libproxy.lamar.edu/10.1007/s10803-019-03955-9

Ahmed Tlili, Mouna Denden, Anqi Duan, Natalia Padilla-Zea, Ronghuai Huang, Tianyue Sun, &

Daniel Burgos. (2022). Game-Based Learning for Learners With Disabilities—What Is

Next? A Systematic Literature Review From the Activity Theory Perspective. *Frontiers*

in Psychology, *12*. https://doi-org.libproxy.lamar.edu/10.3389/fpsyg.2021.814691

Asaro-Saddler, K. (2016). Writing Instruction and Self-Regulation for Students With Autism

Spectrum Disorders. *Topics in Language Disorders*, *36*(3), 266–283.

https://doi-org.libproxy.lamar.edu/10.1097/TLD.0000000000000093

Baalsrud Hauge, J., Wiesner, S., Stefan, I. A., Stefan, A., & Thoben, K.-D. (2016). Applying

Gamification for Developing Formal Knowledge Models: Challenges and Requirements.

IFIP International Conference on Advances in Production Management Systems (APMS),

713–720. https://doi-org.libproxy.lamar.edu/10.1007/978-3-319-51133-7_84

Cruz, C. S. dela, Arenas, M. R., Palaoag, T. D., & Berba, E. M. (2021). Game-Based Learning

System: An Exceptional Learners Motivation for Better Performance. *International*

Journal of Organizational Business Excellence; Vol. 1 No. 1 (2018): June 2018; 13–24 ;

2621-654X ; 2622-8793.

Demirbilek, M., Talan, T., & Alzouebi, K. (2022). An Examination of the Factors and Challenges

to Adopting Gamification in English Foreign Language Teaching. *International Journal*

of Technology in Education, *5*(4), 654–668.

Hunt, J., Taub, M., Marino, M., Duarte, A., Bentley, B., Holman, K., & Banzon, A. (2022). Enhancing Engagement and Fraction Concept Knowledge with a Universally Designed Game Based Curriculum. *Learning Disabilities: A Contemporary Journal*, *20*(1), 77–95.

Mertler, C. A. (2020). *Action research: Improving schools and empowering educators* (6th ed.). Sage Publications, Inc.

Mitchell, D. (2007). "Progressive education in the 1940s." YouTube, https://youtu.be/opXKmwg8VQM. Accessed 7 June 2023.

Murillo-Zamorano, L. R., Sanchez, J. A. L., Godoy-Caballero, A. L., & Munoz, C. B. (2021). Gamification and Active Learning in Higher Education: Is It Possible to Match Digital Society, Academia and Students' Interests? *International Journal of Educational Technology in Higher Education*, *18*, 1–27.

Pennington, R. C., & Delano, M. E. (2012). Writing Instruction for Students With Autism Spectrum Disorders: A Review of Literature. *Focus on Autism & Other Developmental Disabilities*, *27*(3), 158–167. https://doi-org.libproxy.lamar.edu/10.1177/1088357612451318

Stylianidou, N., Sofianidis, A., Manoli, E., & Meletiou-Mavrotheris, M. (2020). "Helping Nemo!"--Using Augmented Reality and Alternate Reality Games in the Context of Universal Design for Learning. *Education Sciences*, *10*.

Thomas, D., & Brown, J. S. (2011). A new culture of learning: Cultivating the imagination for a world of constant change. Lexington, Ky, USA: CreateSpace Independent Publishing Platform.

Trinidad M., Calderon A., & Ruiz M. (2021). GoRace: A Multi-Context and Narrative-Based

      Gamification Suite to Overcome Gamification Technological Challenges. *IEEE Access*,

      9, 65882–65905. https://doi-org.libproxy.lamar.edu/10.1109/ACCESS.2021.3076291

Zolkipli, N. Z., Rahmatullah, B., Mohamad Samuri, S., Árva, V., & Sugiyo Pranoto, Y. K.

      (2023). "Leave No One Behind": A Systematic Literature Review on Game-Based

      Learning Courseware for Preschool Children with Learning Disabilities. *Southeast Asia*

      Early Childhood, *12*(1), 79–97.

Appendix A: Open Question Teacher Questionnaire on Writing Among Students with Autism Spectrum Disorder (Pre- Research)

TEACHER'S PRE-QUESTIONAIRE

Have you worked with students with Autism Spectrum Disorder?

What trends have or did you notice when it comes to these students completing writing tasks?

What strategies have you used to provide these students with the opportunity to overcome these trends?

What have you noticed about these students handwriting when completing these types of tasks?

What is your prospective on Using Game-like activities to enhance participation and motivation?

Appendix B: Participation Checklist: Engaging in Writing Tasks (During Research)

PARTICIPATION CHART: ENGAGING IN WRITING TASKS

DATE	ACTIVITY	🙂	☹️	COMMENTS ON BEHAVIOR

Appendix C: Lead Teacher Observation Journal (During Research)

Date:_____

Teacher:_____

Instructions

Please provide a description of the activity, if the student participated or did not with the gamification strategy implemented, and your observation on the student's behavior during the activity.

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