

Committing to Collaboration: Participatory Approach to Developing Game Design and Employment Workshops for Autistic Youth

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Background

- Autistic people often face barriers obtaining meaningful employment ^{1, 2}.
- Some autistic people have STEM interests and strengths aligned with workforce needs ^{3, 4}.
- Together with a participatory team of neurodivergent students, and an ed-tech not-for-profit called Tech Kids Unlimited (TKU), we are iteratively developing game design and employment skills workshops for autistic youth.

Objectives

1. Describe participatory approach to developing workshop learning objectives (LOs) for Year 2.
2. Outline challenges honoring participatory directives.
3. Assess outcomes of workshop participation.
4. Identify instructional strategies that engage autistic youth.

Participatory Team

Who are we?

- Research staff, TKU staff and alumni, neurodivergent high school, undergrad and grad students.

What do we do?

- To ensure the project is guided by autistic voices, we meet once a month to make key project decisions (e.g., hypotheses, assessments, workshop LOs).
- Key decisions do not move forward without consensus via the AASPIRE voting method ⁵.

Methods

Pre-workshop Screener

23 participants were screened for interest in workshop topics, basic tech skills, and rated their interest in learning workshop LOs.

Pre- and Post-Workshop Assessments

22 of 23 students ($M_{age} = 16.82$, $SD = 2.24$, N. of M. = 18, F = 2, non-binary = 2) completed:

- *Interview*:
 - Pre: Motivations for joining the workshop, job goals, self-understanding, self-advocacy, etc.
 - Post: Feedback on the workshop, job goals, self-understanding, self-advocacy, etc.
- *Survey*:
 - Self-determination ⁶, video game design, and career decision-making self-efficacy ⁷.
- *Cambridge Brain Sciences* ⁸ (CBS, see Figure 1):
 - Computerized, game-like tasks measuring cognition and attention.

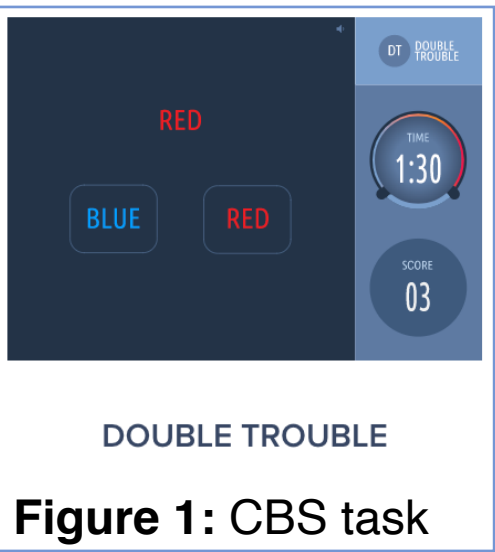


Figure 1: CBS task

In-Workshop Assessment

- Probed workshop activities were preselected and varied across key dimensions:
 - Collaboration (structured vs unstructured), and type (tech only, employment only, hybrid).
- Students rated engagement after workshop activities, using 4 picture scales (e.g., Figure 3).

Participatory Approach

Research Team

- Reviewed employment skills, training literature, and Year 1 student engagement ratings.
- Created a list of game design and employment LOs for Year 2.

Participatory Team

- Rated importance of incoming students learning LOs and proposed changes to LOs.
- LOs updated in line with feedback and Participatory Team re-voted to move forward with LOs.

Workshop Students

- Screener: workshop students rated how interested they were to learn each LO.

Final Learning Objectives (LOs)

- Participatory team and incoming student ratings were well aligned, however, **incoming students rated ‘identifying appropriate workplace conversation’ as important to learn.**
- **Participatory members** were **concerned** that teaching ‘**identifying appropriate conversation**’ may **promote ableism and masking.**
 - **LO was retitled: ‘Understanding Workplace Dynamics’.**
 - Content focused on (1) pros and cons of disclosing, and (2) asking for accommodations at school/work. **Modules were delivered by an autistic researcher.**

Results

- Student interest in learning specific LOs was sometimes associated with student-reported engagement in workshop activities (*Note: Pre-registered $\alpha = 0.01$, for all analyses*)
 - E.g., Interest in creating websites and troubleshooting were associated with engagement in working on a personal website/devlog ($ps < .006$).

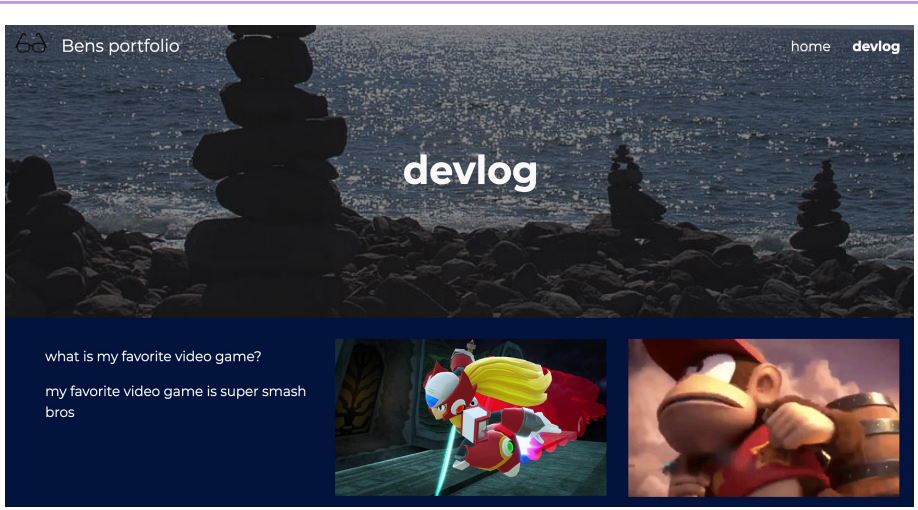


Figure 2: Example Student Devlog



Figure 3: Student Engagement Rating Scale

- Trend toward structured collaborative activities more engaging than unstructured ($ps \leq .04$).
- No evidence that hybrid activities more engaging than game design/employment only ($ps > .21$).

Table 1: Engagement Probe Matrix: Workshop activities by activity type and structure (average ratings)

Tech			Hybrid			Employment			
	Game Design/ CT	User	Self-Adv + Tech	Tech/CT+ Task Management	User + Feedback/ Task Management	Self-Advocacy	Collaboration/ Task Management	Career Interests	Workplace Dynamics
Structure	Independent	Game Design Basics (1.29)	User Interface (1.11)	Intro to Advocacy (0.95)	Managing Independent Work on Projects (0.79) (repeat) (0.86)	User Experience (1.17)	Self-Advocacy (1.05)	Effective Collaboration Skills (0.70) Agile Collaboration (0.71)	Workplace (0.68) Seeking Accommodations at Work/School (1.24)
	Collaboration Structured	Game Mechanics (1.06)	Final Showcase (1.26)	Final Workshop Review (1.48)	Managing Team Progress: Gantt Chart (1.19)	Midpoint Workshop Review (1.25)	Roles (1.41)		
	Collaboration Unstructured	Gameworld Design (1.30)		Disability Disclosure (0.74)		Advocacy in Different Contexts (0.52)			

Note: N = 22; Mean ratings for activities in brackets; Response scale Interested (2) to Bored (-2).

- Improvements in game design self-efficacy ($p = .004$) from pre- ($M = 4.96$) to post-test ($M = 7.14$).
- No improvements in career self-efficacy and self-determination ($ps = 0.07$).

Engagement Strategies

- Student engagement ratings demonstrated that to enable autistic youth to hone their individual game design and employment skills, workshops should incorporate engaging, collaborative, and neurodiversity-affirmative activities.
- STEM-related special interests, particularly in the area of technology, were the most common type of special interest reported by students. This could provide some evidence that interest is central to engagement (*see Daniel Batkin’s Poster for more information, Abstract #45301*).

Committing to Collaboration

- To collaboratively improve the workshop, students reviewed and discussed their engagement ratings at the midpoint and end of the workshop.
- Staff adjusted curriculum and instructional approaches, based on student feedback (*see below*). On the final day, students reflected that the workshop atmosphere and curriculum had improved.

“repetitiveness, such as in the self advocacy lessons is not admired, and gets frustrating”

“working together is more fun”

“The Jamboard was probably popular because it was hands on and interactive, and you got to be creative”

“People enjoyed stuff more because you took the feedback and you made it better. People didn’t enjoy explaining self-advocacy so they had shorter lessons”

“I think a lot more people liked it near the end because there were more activities to do as a group besides our independent work.”

- Despite adopting a participatory approach to our research and coaching staff (led by an autistic researcher) to use neurodiversity-affirmative approaches, normalizing language and goals (e.g., pushing students to adapt to “norms”) emerged in the workshop.

Conclusions

Future workshops seeking to improve autistic employment outcomes should incorporate engaging, collaborative, and neurodiversity-affirmative activities for participants to develop their interests and employment skills. We hope autistic people’s employment outcomes in STEM and other settings would thereby improve.

Next Steps

- Actively hire more staff who identify as neurodivergent, so students have access to role models.
- Further centralize participatory voices in the creation and review of staff training and curriculum.
- Increase staff training focused on embedding neurodiversity-affirmative approaches (e.g., valuing all forms of communication) and principles of universal design (e.g., providing individualized support) into our practice.

References

- ¹ Burgess, S., & Cimera, R. E. (2014). Employment outcomes of transition-aged adults with autism spectrum disorders: A state of the states report. *American journal on intellectual and developmental disabilities*, 119(1), 64-83.
- ² Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary education and employment among youth with an autism spectrum disorder. *Pediatrics*, 129(6), 1042-1049.
- ³ United States Department of Labor, Bureau of Labor Statistics. *Labor Force Statistics from the Current Population Survey*. 2015
- ⁴ Krzeminska, A., & Hawse, S. (2020). Mainstreaming neurodiversity for an inclusive and sustainable future workforce: Autism-spectrum employees. *Industry and higher Education: Case studies for sustainable futures*, 229-261.
- ⁵ Nicolaidis, C., Raymaker, D., Kapp, S. K., Baagds, A., Ashkenazy, E., McDonald, K., ... & Joyce, A. (2019). The AASPIRE practice-based guidelines for the inclusion of autistic adults in research as co-researchers and study participants. *Autism*, 23(8), 2007-2019.
- ⁶ Shogren, K. A., Wehmeyer, M. L., Little, T. D., Forber-Pratt, A. J., Palmer, S. B., & Seo, H. (2017). Preliminary validity and reliability of scores on the Self-Determination Inventory: Student Report version. *Career Development and Transition for Exceptional Individuals*, 40(2), 92-103.
- ⁷ Summers, J. J., & Falco, L. D. (2022). Evaluating construct validity of the Middle School Self-Efficacy Scale with high school adolescents. *Journal of Career Development*, 49(4), 735-752.
- ⁸ Owen, A. M., Hampshire, A., Grahn, J. A., Stenton, R., Dajani, S., Burns, A. S., ... & Ballard, C. G. (2010). Putting brain training to the test. *Nature*, 465(7299), 775-778



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