

The Effects of Assistive Technology on the Frequency and Duration of Maladaptive Behavior in Adults with Intellectual Disabilities

By:

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Introduction

- Previous research has successfully examined the effects of assistive technology such as iPads on the reduction of frequency and duration of maladaptive behavior (Intille, 2012; Nieman, 2013; Acotto, 2014; and Neely et al. 2012).
- iPads are increasingly used in education and Day Training (DT) settings for adults with Autism (Neely et al. 2013; O' Malley et al. 2014) and adults with intellectual disabilities (Korda & Itani, 2011; Guardino & Fullerton, 2012).
- The purpose of the present study was to: a) examine the effects of assistive technology on the reduction of maladaptive behavior using iPads, b) increase the frequency and duration of on-task behavior, and c) evaluate client satisfaction of program delivery using iPads in behavior management.

Methods

Participants:

- 12 adults with intellectual disabilities (3 w/ Autism; 3 w/ Down Syndrome; 3 w/ Mild ID; 3 w/ Moderate ID)
- 6 = Male; 6 = Female
- Age range: 25 to 65
- All participants had fair to good motor skills, vision, and hearing skills

Setting:

- A 40' X 40' Classroom/Learning Lab w/ florescent lighting

Apparatus:

- Twelve 16GB white Apple iPads (4th Gen)
- Twelve work stations w/ twelve chairs
- Sony 3D Home Theater Projector w/ 300 watt surround sound system (to provide connectivity for the streaming services offered by Apple TV and Microsoft products)
- One 96" X 120" Projection Screen
- Learning Lab Facilitator who is a trained Direct Service Professional (DSP)
- Behavior Support Plans for each participant written by a certified Behavior Analyst
- Frequency Data Sheets with individualized behavior(s) for each participant
- Learning Lab Curriculum

Experimental Design:

- ABAB Reversal Design
- *Dependent Variable:* Frequency of maladaptive behavior(s)
- *Independent Variable:* Course Curriculum administered on iPads

General Procedures:

- The following target behaviors were identified and operationally defined based on participants' Behavior Support Plans:

<i>Self-Injurious Behavior (SIB)</i>	<i>Wandering/Elopement</i>
<i>Socially Inappropriate Behavior</i>	<i>Stealing</i>
<i>Aggression (Verbal & Physical)</i>	<i>Non-Compliance</i>

- Target behaviors were measured using a partial interval recording system. Partial interval recording was selected as it allows for recording of the occurrence (i.e., frequency) of target behavior during class sessions.
- Prior to baseline, *teacher training* was provided to the Learning Lab Facilitator on each participant's Behavior Plan and implementation of the Learning Lab Curriculum.
- **Baseline (A)** data was obtained by recording the frequency of each participant's maladaptive behavior identified in his/her Behavior Plan in the natural environment.
- **Intervention 1 (B)** involved the administration of the course curriculum on iPads.
- **A return to baseline (A) and Intervention 2 (B)** were carried out identical to the first baseline and Intervention 1 to account for *Experimental Control*.
- Data were analyzed using *descriptive statistics* and *graphical analysis*. Observations were conducted a minimum of three times per week by a trained data collector.
- **Inter-rater data** were collected by a trained data collector for 25% of the total sessions. The overall inter-rater reliability was high, averaging 93% (ranging from 78 – 100%).
- **Social Validity** was conducted using interviews and surveys for the twelve participants, their Vocational Counselors, and QIDP's. The interview data were analyzed by reporting the qualitative trends in the interviews and by comparing rankings of the occurrence of the behavior among different conditions (baseline & intervention).
- **Treatment Integrity** was assessed to ensure the study was carried out to the degree to which the interventions were implemented as intended. This included operational definitions and questionnaires that probed the researcher so that the intervention was systematically manipulated.

Results

Figure 1: Displays the graphical analysis of the results from both baseline conditions and interventions.

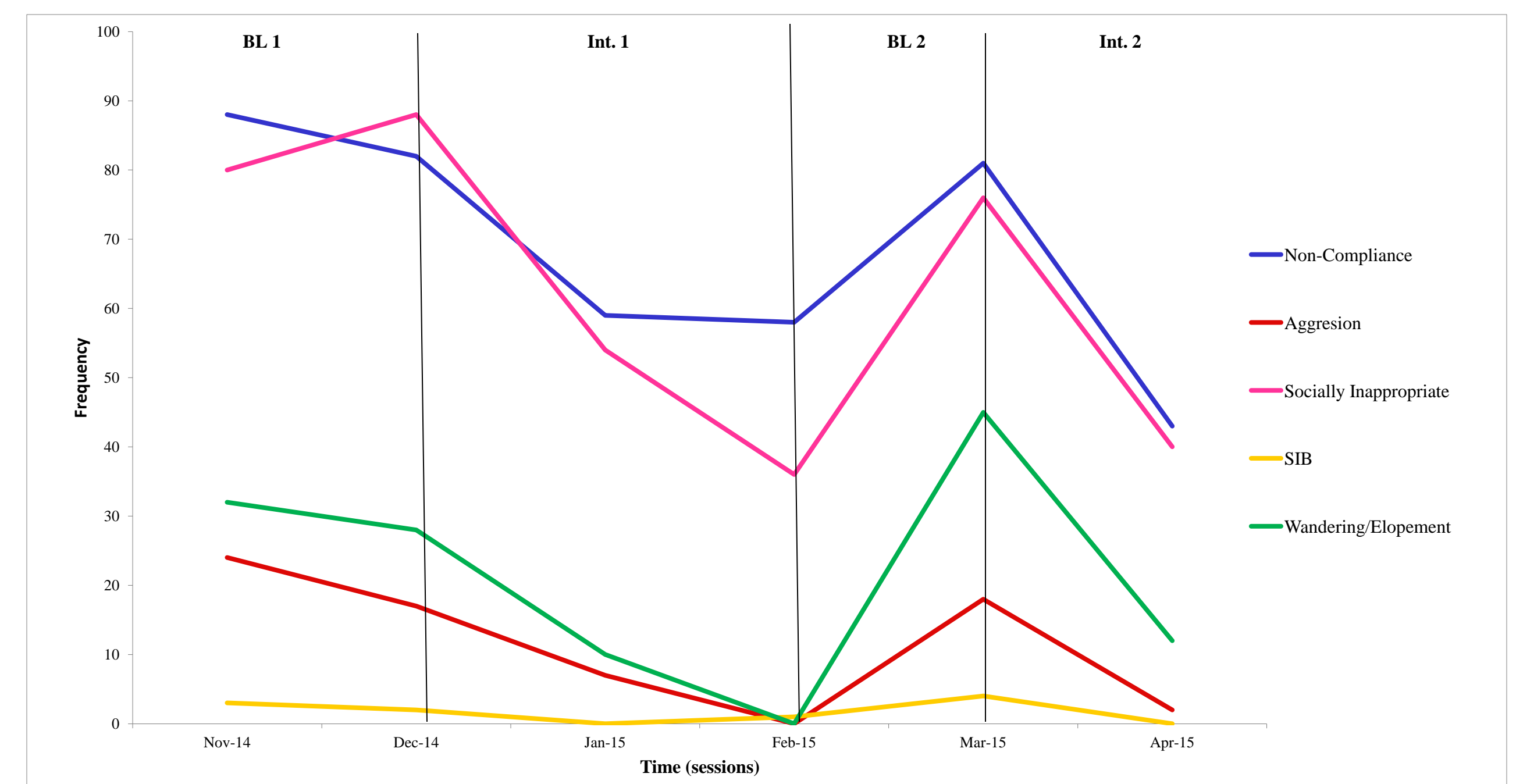


Figure 1

- Results from the present study successfully demonstrated that the identified maladaptive behaviors decreased when a course curriculum was administered on iPads.
- During Intervention target behaviors decreased by nearly half. When baseline was reintroduced, target behaviors increased to their original baseline values, or higher.
- In addition to the decrease in frequency, the duration of on-task behavior increased slightly in 4 participants and increased dramatically in 8 of the participants.
- The results of the Social Validity Assessments were consistent with the frequency scores for 10 out of 12 participants.

Discussion

- The current results expand existing research on maladaptive behavior and assistive technology.
- The research design demonstrates a high rate of experimental control, which shows that a curriculum utilizing assistive technology in the form of iPads successfully reduced maladaptive behavior in adults with intellectual disabilities in a workshop setting.
- Findings also suggest iPads can be effective instructional tools to enhance learning and independence, an implication for future research.
- *Limitations* suggest that despite their many advantages, assistive devices may not be suited to the needs of every adult with an intellectual disability. Extraneous variables such as motivation, visual impairments, and motor skills should be highly considered.
- *Implications* for future studies should replicate these procedures with a greater number of participants. The apps and features used for entertainment purposes can function as powerful reinforcers to facilitate higher rates of learning. The experimental control demonstrated allows for prediction, verification, and replication of future studies.
- The iPads were found to create immediate feedback and each participant was in control of the pacing of his/her learning. This serves as both an implication and limitation of the study.
- **Contributors:** El Valor thanks Comcast for their generosity in donating the technology used in this research project. Other contributors: Mirta Bueno, research assistant; Raquel Reyes, Learning Lab Facilitator; Dennis Warren, Director of IT; and El Valor's staff who completed the surveys.

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