# Using Simulation-based Training and eLearning to Teach Students How to Conduct Functional Analyses

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# Introduction

* Many Functional Analysis training packages focus on implementation (Ramirez et al., 2016)
* Training requires a lot of time and the use of expert trainers (Ramirez et al., 2016)
* The use of **technology**
	+ Reduced cost & resources

 eLearning

 Robot simulating a client with problem behavior

# Purpose

* Examine the effectiveness of a Standard FA training using
	+ **Instructional eLearning** modules and
	+ **Simulations using a humanoid robot** on implementation, data collection,

graphing, interpretation, and problem solving skills.

# Participants & Settings

* Total of 7 graduate students (2 men, 5 women)
	+ Enrolled in an advanced research methods class
	+ Prior coursework on assessment and treatment of problem behavior
* eLearning Modules
	+ Accessible in any setting with a computer via a Google Drive link
* Simulation-based Training
	+ Observation rooms with one-way mirrors on the university campus

# Response Measurement

* **Knowledge of component skills** measured by multiple choice and fill-in tests:
	+ Data Collection
	+ Interpretation
	+ Problem Solving
	+ Graphing

# Pre-post test design

* + 20 items total (5 per component skill)
	+ Calculated **percentage correct** on tests

# Intervention: e-Learning Modules

* Five-part eLearning module on FA methods
	+ Average time to completion was 6 hours
	+ Components targeted knowledge test content
1. Implementation (Iwata et al., 1994)
2. Data Collection
3. Graphing
4. Interpretation (Roane et al., 2013)
5. Problem solving (Chok et al., 2012)

# Results of completing the modules

**1 0 0**

**8 0** P r e - T e s t

**P e r c e n t a g e o f C o r r e c t R e s p o n s e s**

P o s t-T e s t

**6 0**

**4 0**

**2 0**

**0**

**D a ta C o lle c tio n G r a p h in g In te r p r e ta tio n P r o b le m S o lv in g T o ta l T e s t S c o r e**

# Implementation Skills

* Performance monitoring tool (adapted from Ward-Horner & Sturmey, 2012)

# Overall percentage correct

* + Mastery criteria: one session > 90%
* Trial-by-trial IOA
	+ **90% agreement** (range of 80%-100%)
* Standard FA condition properties
	+ Participants informed of:

# Intervention

 Results of preference assessment results

 Demand: Clap hands

* + 2-min. conditions across a humanoid robot

 Fixed order: Attention, play, & demand

* Total training time (M=25 min; Mdn= 18 min)

# Implementation Results



**Summary**



* eLearning

# Limitations

* + Participants were graduate students
	+ Improvements to weaker module components
* Test Development
	+ Knowledge tests not counterbalanced to assess difficulty
	+ Post-test results did not include implementation knowledge test (screening)
	+ Test sections were too short (each section should be 10 questions)

# Implications

* eLearning modules together with simulation-based training may be a great alternative to teach FA methodology in a time and cost efficient manner.

# Selected References

Chok, J. T., Shlesinger, A., Studer, L., & Bird, F. L. (2012). Description of a practitioner training program on functional analysis and treatment development. *Behavior Analysis in Practice*, *5*(2), 25.

Iwata, B.A., Dorsey, M.F., Slifer, K.J., Bauman, K.E., & Richman, G.S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis, 27,* 197-209. doi: 10.1901/jaba.1994.27-197 (Reprinted from *Analysis and Intervention in*

*Developmental Disabilities, 2,* 3-20, 1982)

Ramirez, V., Kazemi, E., & Esmaeili, V. (2016). A systematic review of functional analysis trainings. Unpublished raw data.

Roane, H. S., Fisher, W. W., Kelley, M. E., Mevers, J. L. and Bouxsein, K. J. (2013). Using modified visual-inspection criteria to interpret functional analysis outfomes. *Journal of Applied Behavior Analysis, 46*, 130–146. doi:10.1002/jaba.13

WardIHorner, J., & Sturmey, P. (2012). Component analysis of behavior skills training in functional analysis. *Behavioral Interventions*, *27*(2)