PROGRAMMED EQUIVALENCE BASED SELF-INSTRUCTION (PEBI) TO TEACH BEHAVIOR ANALYTIC CONCEPTS

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INTRODUCTION

- Complex higher order thinking skills are expected of university students
- One measure of such complexity is the extent to which appropriate intraverbals are developed.
- Most courses rely on reading and lecture or discussion, the use of programmed self-instruction modules (PSIM) may also benefit learners.
- PSMI sequences frames with fill ins of 1-2 words each within larger modules to learn material. The question is how best to sequence material and incorporate equivalence-based instruction (EBI) into lectures and online formats.
- Programmed instruction has been used as a legitimate alternative to in-person or on-campus learning as seen in Fernald and Jordan (1991), and Root and Rehfeldt (2020).
- B.F. Skinner's 1958 Teaching Machines, Pressey's teaching machines in the 1920s.
- Walker and Rehfeldt, (2012) used the stimulus equivalence in combination with Skinner's taxonomy and the web-based learning, specifically the blackboard platform to teach graphs and clinical vignettes
- LeBlanc et. al, (2003) extended previous work on EBI by adding the reinforcement to the stimulus equivalency to teach US geography.
- Fienup and Critchfield, (2011) looked at using the EBI in a less controlled setting and determined the effectiveness and efficacy of stimulus equivalence when compared with complete instruction and no formal instruction
- In this poster, two studies are reported in which programmed self-instruction designed through EBI (PEBI) was used to teach either operant reinforcement or prompting concepts and procedures.

METHOD

Participants:

- Undergraduate students (n=6)

Setting:

- The PI modules were completed via a Zoom session.

Materials:

- Learning website, individual logins

Design:

- Each module frame was a fill-in-the-blank
- Consideration for variation in answers (e.g. plurals, numerical answers, etc.).
- Correct answers were marked with a green check
- Incorrect answers were marked with a red X and the correct answer was displayed
- All incorrect frames were then moved to the end of the module set to allow for another attempts.
- Unlimited attempts were allowed.

PROCEDURE

- Undergraduate participants (n=6) completed a pre-test, the respective online PEBI modules, post-test, and post-assessment surveys.
- Dependent measures:
  - (a) percentage of correct fill-in and generative answers on pre- and post-tests
  - (b) latency and cumulative latency for correct responses
  - (c) and number of trials/frames to mastery criteria within modules.
- Surveys consisted of 13 questions to be answered using a Likert Scale, and one open response.
- Post assessment, data was analyzed, and surveys were reviewed.
- Edits were made to frames that required more variation in answer options. Other frames were edited for content to be clearer.

Table 1
Table to show an example of module frames

	Reinforcement
A-B	The relationship between a response and a consequence following a response is_____. (Reinforcement)
B-A	Reinforcement is the relationship between a _____and a _____ following a response. (response, consequence)
B-C	When thinking about the relationship between a response and _____, giving praise or not having to _____ work would be examples. (consequence, complete)
C-B	Praise would be an example of the _____ between a _____ and consequence involving a stimulus change following a response. (relationship, response)
A-C	An example of reinforcement would be praise or not having to complete _____ (work)
C-A	Praise, or getting out of doing work are both examples of types of_____. (reinforcement)

Figure 1
Graph to show Cumulative Latency

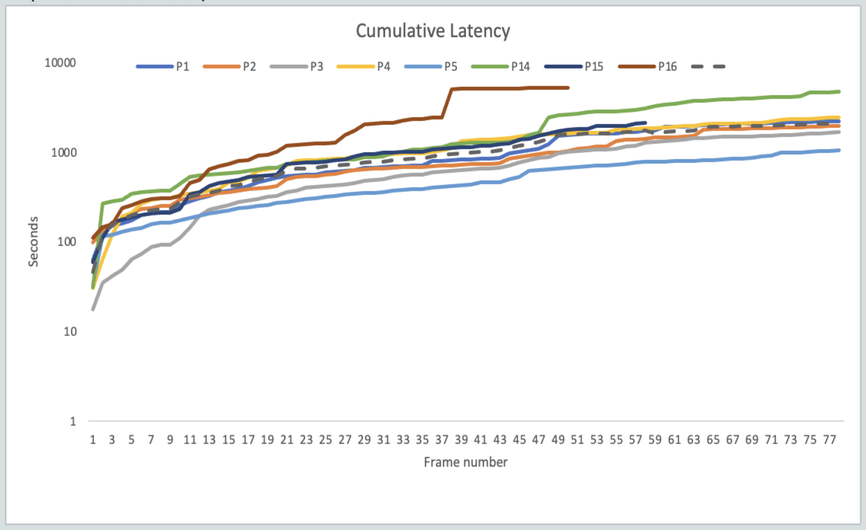


Figure 2
Graph to show attempts to mastery of modules 1-3

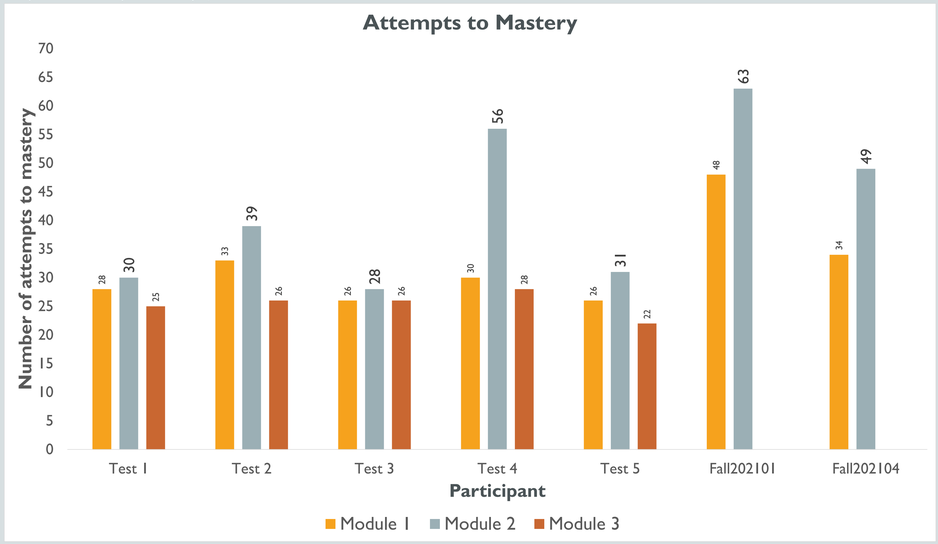


Figure 3
Graph to show Pre- test results

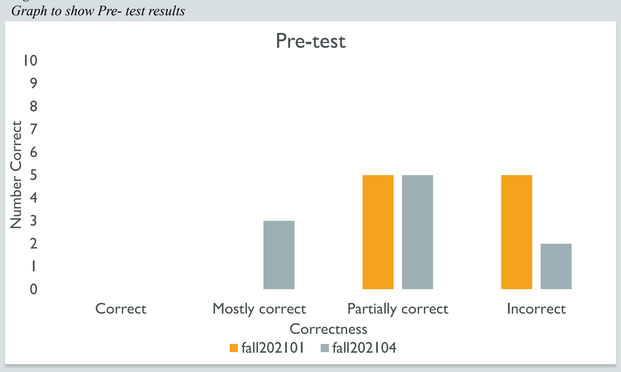
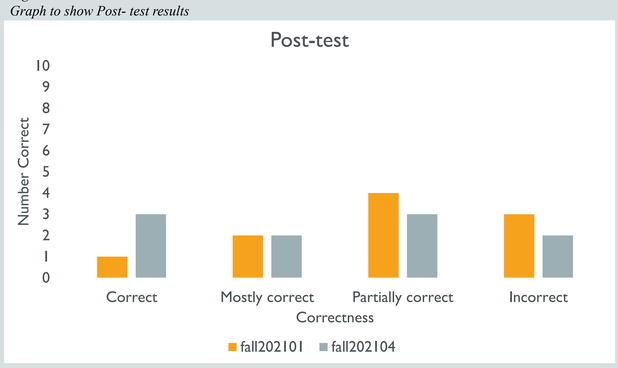


Figure 4
Graph to show Post- test results



RESULTS

- The results of this study indicate that PEBI systems can be used to teach these concepts, and most of the participants' scores increased on the post-test versus the pre-test.
- Although not all participants completed all modules to mastery, each participant contacted the information/correct answers.
- Participants were able to increase the overall 'correctness' of their responses.
- Some modules were completed in less time versus others.
- Latency to complete individual frames shows that some frames took less time to complete.
- Participants required more time to complete all modules
- Post-assessment surveys showed that some participants thought this method would be beneficial to their learning of some topics
- Although it was somewhat enjoyable to complete, they found some modules/topics to be more difficult than others.
- Base or background knowledge of topics would have been more helpful to the participants.

DISCUSSION

- While preliminary, this method shows promise for future studies using PEBI.
- There were some limitations to this current study; time, and number of participants.
- With more time and more participants to complete the modules, there would be more data to assess.
- To conduct teaching using PEBI in person and through Zoom to determine which mode is more effective.

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Table 2
Table showing survey questions for participants to complete post-assessment

1.This set of modules was well-organized
2. I was able to complete the modules with few errors
3. I was surprised at how quickly I learned the material in the modules
4. I learned something new while completing these modules
5. I made errors when completing the modules
6. Making errors in the modules is frustrating
7.It seemed like the modules sometimes required a leap of logic that I couldn't make at first
8. It took me longer than I thought to complete these modules
9. Some parts of the modules were harder to complete than other parts
10. It would be nice to have modules for more concepts that I need to learn
11. Modules like this would be nice to have to practice in addition to a textbook
12. The topics covered were difficult or complex
13. The difficulty of the topics seemed like it was broken down into manageable units
14. What feedback would you provide to the instructional designer of these modules?