Exploring Requirements for an Adaptive Exercise Selection System

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The Study

- Focus group study

- Explores characteristics for exercise selection

- Explores how humans adapt exercise selection to learner personality and performance

The Design

- Six focus groups

- Investigated three personality traits
    1. Conscientiousness (FG1A & FG1B)
    2. Self-Esteem (FG2A & FG2B)
    3. Emotional Stability (FG3A & FG3B)

The Participants

- 33 students altogether (postgraduate and undergraduate students)
- Students were selected from computing and learning domain
- Participants were given information sheets and consent forms
- Participation was voluntary and withdrawal was allowed

Focus Group	Total number of participants	Males	Females	Personality Trait	Status
FG1A	4	2	2	Conscientiousness	Post – graduates students
FG1B	5	2	3	Conscientiousness	Post – graduate students
FG2A	5	5	0	Self-esteem	Undergraduate students
FG2B	4	4	0	Self-esteem	Undergraduate students
FG3A	7	5	2	Neuroticism	Undergraduate students
FG3B	8	7	1	Neuroticism	Undergraduate students

The Research Questions

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Q2. What do we need to know about exercises (*exercise characteristics*) to know which one to pick next for the learner?

Q3. What *next exercise* should be selected for the learner?

The Materials
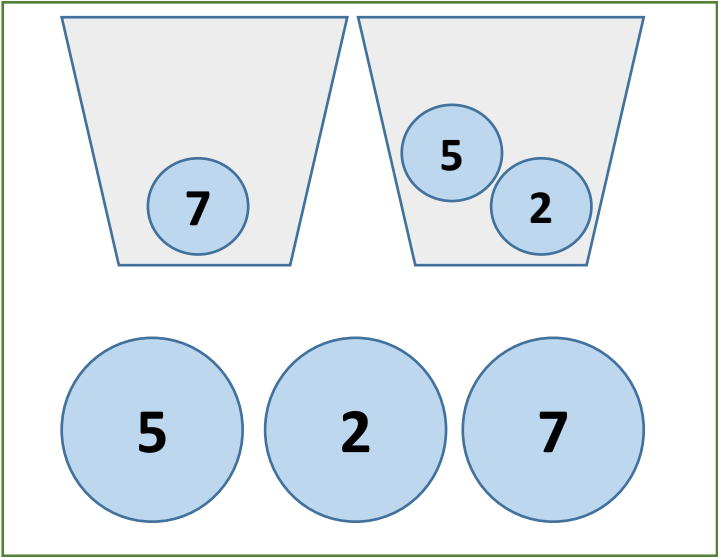
Validated trait Stories:

LEVEL	STORY
High	Kate is a student who is confident about her abilities. She is satisfied about the way she looks and feels good about herself. She thinks she is as smart as others and believes that others admire and respect her. She feels that she has a good understanding of things.
Low	Kate is a student who worries about the impression she makes and whether she is regarded as a success or a failure. She feels like she is not doing well and believes she cannot understand the things she reads. Nancy thinks she is unattractive and is displeased with herself. She feels inferior to others.

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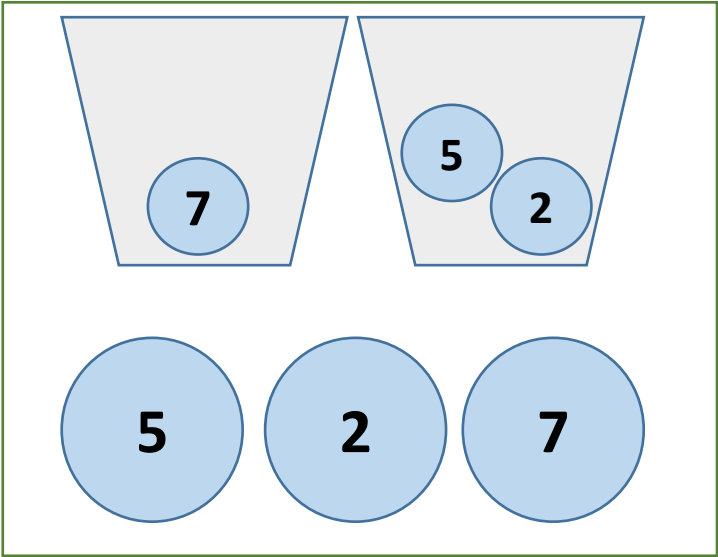| LEVEL	STORY
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Exercise card:

The Materials

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Exercise card:

Performance card:

- "she did really well"
- "she just passed
- "she just failed
- "she did very badly

The Procedure

- A semi structured approach was used

- Participants were asked research question 1 (**Q1**)

- Participants were asked research question 2 (**Q2**)

- For research question 3 (**Q3**), participants were:
  - Shown 2 students who differed in personality
  - Shown a sample exercise
  - Told one possible past performance
  - Asked to pick the next exercise difficulty for the learner

- Repeated four times for each past performance level for the two learners

The Results

Result Table for Q1 and Q2

Characteristics	Conscientiousness		Self-esteem		Neuroticism	
	FG1A	**FG1B**	**FG2A**	**FG2B**	**FG3A**	**FG3B**
Learner Characteristics **Age** **Past performance** **Learning style** **Knowledge** **Personality**	Support, Age, Performance	Past experience, Learning style, Competence Time, Feeling	Learning styles, Knowledge, Time, Experience, Interest, Past performance	Age, Personality, Difficulty levels	Past performance, Learning styles, Practice, Time, Personality, Feedback	Age, Topic knowledge, Culture, Information, Confidence, Experience
Exercise Characteristics **Exercise difficulty** **Feedback**			Relevance, Presentation, Difficulty levels, Support	Feedback, Ground rules	Difficulty levels	Difficulty levels, Relevance, Presentation, Experience, Support

Result Table for Q3

Conditions	Conscientiousness High		Conscientiousness Low		Self-Esteem High		Self-Esteem Low		Neuroticism High		Neuroticism Low	
	FG1A	**FG1B**	**FG1A**	**FG1B**	**FG2A**	**FG2B**	**FG2A**	**FG2B**	**FG3A**	**FG3B**	**FG3A**	**FG3B**
Did well	MD	SMD	SMD	NR	MD	MD	SMD	SMD	MD	MD	SMD	SMD
Just passed	NR	S,MD,ES	S	S	S	SMD	SMD	S&ES	S	S	ES	S
Just Passed	NR	ES & S	ES & S	ES&S	ES	S	S	S	S	S	ES	NR
Failed badly	NR	S	S	ES	ES	S	ES	ES	ES	ES	ES	ES

Key: MD- More difficult, SMD- Slightly more difficult, S – Same, ES – Easier, NR – No Results

The Conclusion

- Personality, difficulty level of exercises & performance are important

- Learners high in traits were given a more difficult exercise than learners low in the trait.

- Performance is a primary adaptation characteristics in exercise selection

- Differences in adaptations when personality is considered

- More investigations needed for these adaptations

Thank You.