

# Exploring assistive technology use to support cognition in college students with traumatic brain injury

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## INTRODUCTION

College students with mild traumatic brain injuries (TBIs) may experience chronic symptoms necessitating use of external cognitive supports for task completion. This study explored support system use by students with TBI. Deficits resulting from TBIs are of particular concern for individuals re-integrating into higher education settings given the high cognitive demands of such environments. One support mechanism is the adaptation of external cognitive supports either in high- or low-tech forms to support daily tasks; many students with TBI rely on strategies or devices to compensate for cognitive deficits but little is known about the rationale for support choice of the direct selection impact. Understanding how various material features support residual skills or exacerbate challenges displayed by students with TBI remains unexplored. **The study's purpose was to examine support type and characteristic preferences of students with TBI and to evaluate student completion of task execution trials using to differing support systems.**

## METHODS

### Participants:

- All currently enrolled students at a large Midwestern University

Participant	Gender	Age	Year in school	# of TBIs	# of self reported symptoms
GL	F	19	Freshman	3	38
MV	F	19	Freshman	1	10
ZT	M	23	1 <sup>st</sup> year graduate student	1	8

### Materials:

- 53-item symptom checklist
- Cognitive Linguistic Quick Test
- Semi-structured interview questions
- Four low-tech assistive aids: daily planner book, monthly paper calendar, paper checklist, sticky notes
- Four high-tech assistive aids: electronic lists, voice memos, digital calendar, application for phone/tablet for scheduling

### Procedures

#### Phase 1

- Participant completion of symptom checklist
- Pre-interview intervention
  - Semi-structured interview with high- and low-tech support systems
  - Support system rankings
  - Selection of two supports for use during assistive technology trials (i.e., Phase 2)

#### Phase 2

- Participants trialed selected supports during two 10-day periods relying on selected external cognitive aid to execute five tasks
- Exit interview
  - Preferences for, experience using, and potential future use of trialed support systems

## RESULTS

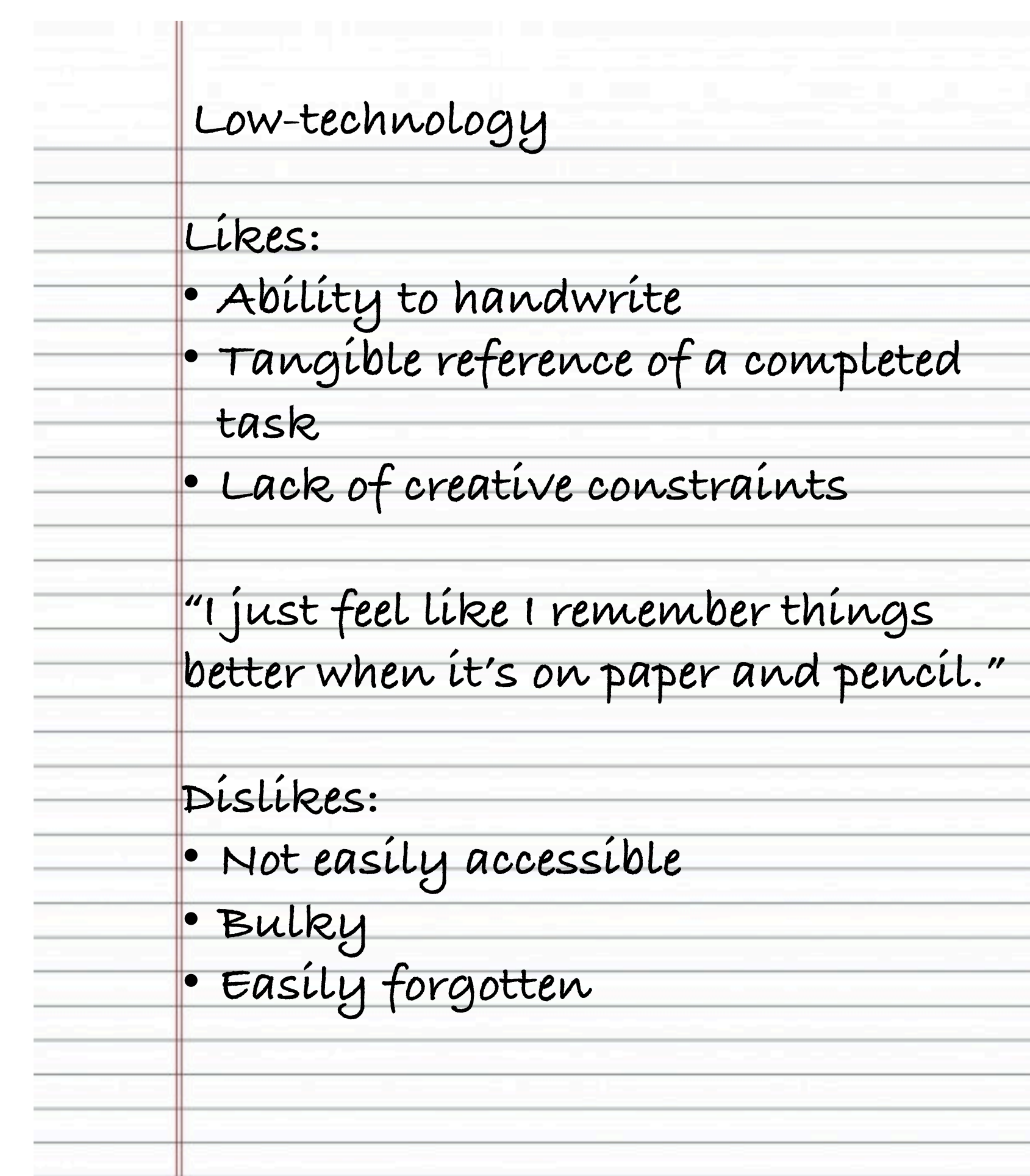
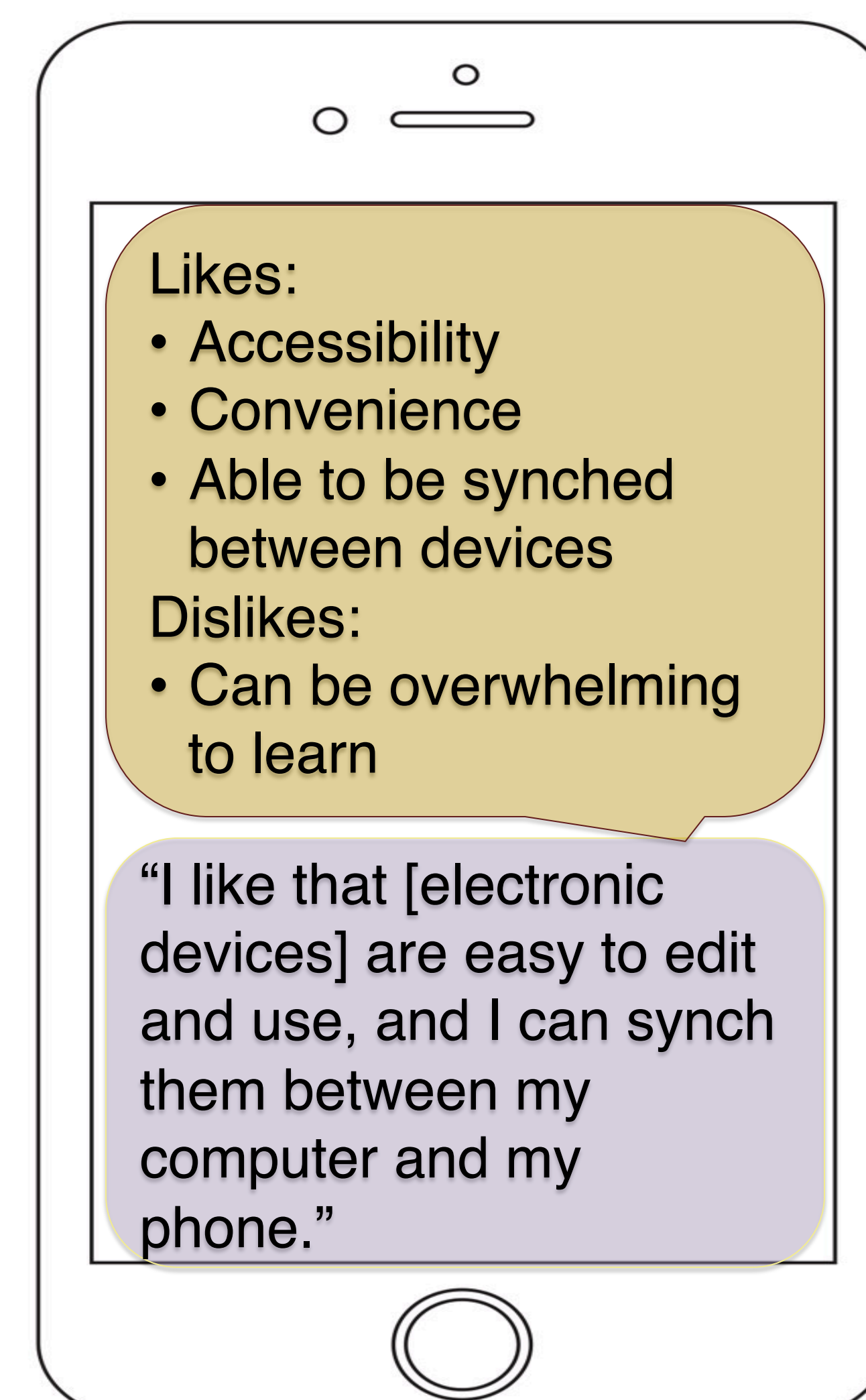
### Data Analysis

- The researchers analyzed pre- and post-interviews through triangulation of transcripts and collected documents.
- Data during both phases was collected via contact between the researchers and participants via email, phone, and in-person meetings.
- Accuracy was calculated using a point-system in which tasks were given value for various details that were to be followed, and depending on how many aspects were correctly carried out, participants were given a point value for each selected task

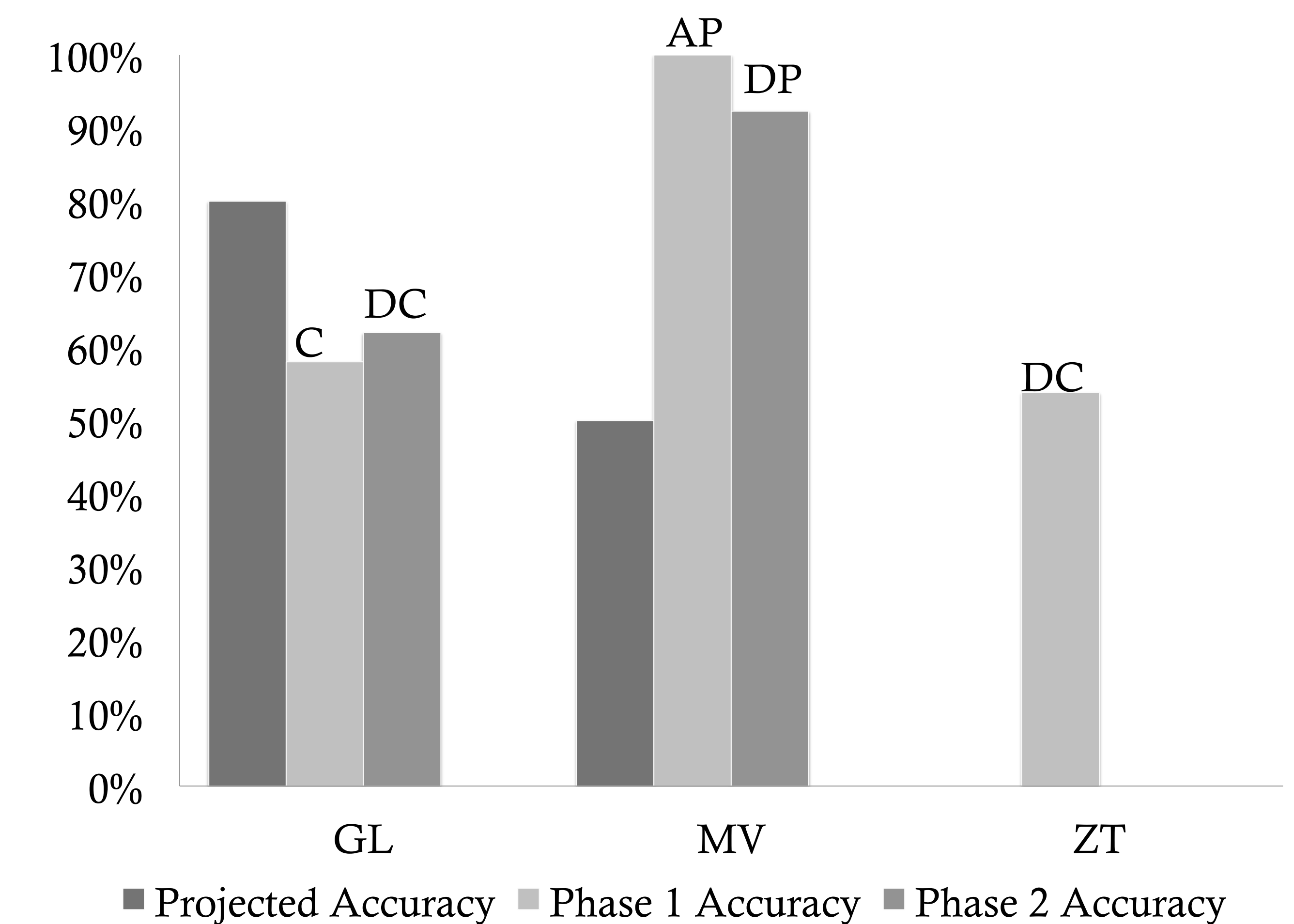
### Participant Preferential Ratings

	Material	Declared 1 <sup>st</sup> choice	Declared 2 <sup>nd</sup> choice	Post-trial preference
Low technology	Daily planner book (DP)		MV	
	Monthly calendar (MC)		ZT	
	Checklist (C)	GL		
	Sticky notes (SN)			
High technology	Electronic list (EL)			
	Voice memo (VM)			
	Digital calendar (DC)	ZT	GL	GL
	Phone/tablet application (AP)	MV		MV

### Pre-trial System Likes and Dislikes



### Completion Accuracy During Trials



### Preferred System Components:

#### Ability to be synchronized with multiple devices

"The one thing that I think is really helpful is being able to synch my calendar with my phone" -GL

#### Visuospatially appealing

"I'm a very visual person so if I don't see something visually I'm not going to do it probably." -MV

#### Accessibility and convenience

"[Electronic devices] are really accessible...that's a really big factor," -MV  
 "The [online] calendar is much more efficient 'cause of the pop-ups 'cause like I always check my phone every 15-10ish minutes" -ZT

#### Reminders

"There was a reminder...at the time I needed it... so that was really helpful." -MV

#### Structure with space for details, but not overcrowding

"[I like] that there was a deadline and kind of a timeframe...I felt like it was easier to do when I had a calendar that showed me dates and stuff like that so I could plan it out better." -GL

## DISCUSSION

Despite common preference themes during pre-interview, exit interviews and task completion results highlight individuality of cognitive aid preference and importance of encouraging students with TBIs to explore different cognitive aid options before drawing conclusions based off of observation or stated preference alone.