Occupational Therapy Lab Education: Supporting Students' Psychomotor Skill Development

Tufts University — Department of Occupational Therapy

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Introduction

CAPSTONE SETTING:

Tufts University Department of Occupational Therapy
- Entry level Doctoral Program
- Post-Professional Master's Program

OTS 224: Physical Dysfunction Lecture & Lab
- Practice class that facilitates practical application of theoretical concepts, physical skills, & clinical reasoning in physical rehabilitation

PROBLEM: Literature reveals gaps in reciprocal relationship between therapist & patient's body while facilitating psychomotor skills, such as functional transfers

SOLUTION: Developing sustainable teaching procedures, activities, & learning materials to better support student's body awareness & psychomotor skill development

LITERATURE REVIEW
- Gap in clinical reasoning for identification of therapeutic potential of movement-to-movement action between therapist & patient[1]
- Research suggests improvements on teaching clinical reasoning through use of reflexive bodily self-awareness, conscious experience of self and prereflexive awareness[1]
- Prereflexive awareness makes therapists more aware of their bodily responses, adjustments, & positioning, which is critical for physical skill development
  - This mode of reasoning is a push towards therapist's thinking about how their body & physical movements are reflected in the movements of clients
- Educational theories such as Simpson's Taxonomy & Dave's Psychomotor Taxonomy reveal physical skill acquisition & mastery best achieved through multistep teaching & practice[2,3]
  - In final tier of Simpson's taxonomy: origination, individuals develop new movement patterns for their situation & display highly developed performance skills[2]
- Increased knowledge, skills, & understanding of psychomotor development, increases proper use of mechanics & safety, decreasing number of transfer-related injuries in practice[4]

Purpose & Aims

Purpose	To improve OT students' confidence & competence in psychomotor skill development
Aim 1:	Develop sustainable teaching procedures & lab activities to support students' reflexive bodily self-awareness & improve body mechanics
Aim 2:	Develop sustainable learning materials consisting of learning modules with physical skill demonstration videos, self-checklists, & decision trees

Methods

Pre-Survey
22 quantitative items & 3 open-ended items
- Measured students' familiarity with functional transfers
- Measured students' level of body awareness
- Assessed students' competence & confidence in psychomotor skills

Post-Survey
22 paired quantitative items + 8 new items, & 18 open-ended/ranked items
- Assessed students' competence & confidence in psychomotor skills
- Measured students' understanding of their current body mechanics
- Evaluated effectiveness & usefulness of supplemental resources

The Process

KEY TERMS
Knowledge of Performance (KP)[5]: The process or characteristics of movement that lead to an outcome
Knowledge of Results (KR)[5]: External information indicating the outcome of a motor skill
External Focus Cues[5]: Directs attention towards things occurring externally or towards a movement outcome

TASKS
Teaching & Lab Facilitation (3) — Instructional Material Development — Online Module Development
Pre & Post Survey Administration — Physical Skills Workshops — Lab Practical Support

TEACHING PRINCIPLES AND METHODS
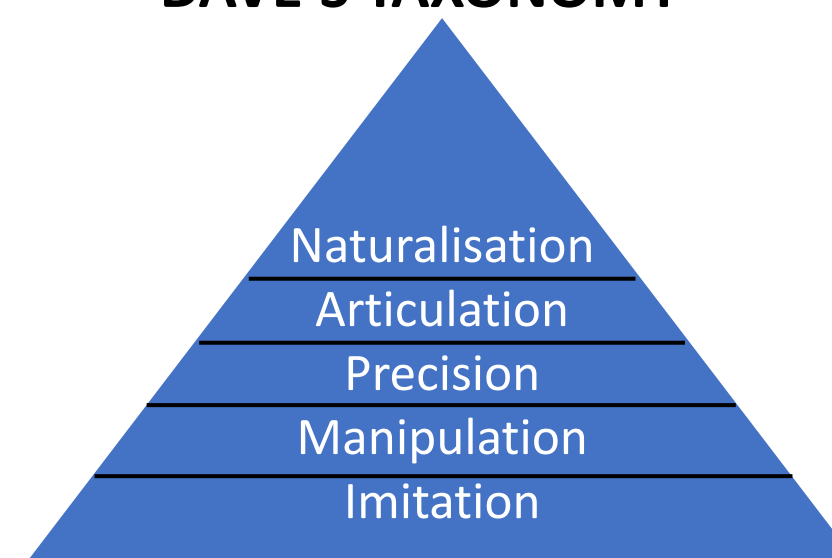
CUEING LANGUAGE[5]
- Simulated Cues
- Real World Cues
- KP Cues
- KR Cues
- Verbal Analogies
- Nonverbal & Physical Cues

DAVE'S TAXONOMY[6]
(pyramid, top to bottom)
- Naturalisation
- Articulation
- Precision
- Manipulation
- Imitation

TEACHING STYLE[5]
1. Describe It
2. Demonstrate It
3. Cue It
4. Do It [students]
5. Debrief It

PROJECT DELIVERABLES
- Transfer & Scapular Preparation Self-Checklists
- Transfer & Motor Control: Post Stroke Scapular Preparation Decision Trees
- Bed Mobility Flow Diagram
- Lab Outlines & Procedures
- Physical Skills Workshop
- Supplemental Demonstration Videos
- Supplemental Skill Resource Sheets
- AOTA Education Summit Submission

KEY FEATURES
- Self-checklists utilized questions to scaffold clinical reasoning, cueing, & reflection by students on their performance & prereflexive body awareness
- Decision trees integrated KP, KR, cueing, clinical reasoning, & problem solving into visual diagrams to encourage students' reflection on their step-by-step skill performance with redirection as needed during performance
- Lab outlines & procedures provided detailed: materials & space set up, group sizes, demonstrations, verbal & nonverbal cues to support future replication & sustainable teaching procedures
- Supplemental videos demonstrated safe & ideal therapist body mechanics

Results

PAIRED SAMPLES T-TEST (N=30)

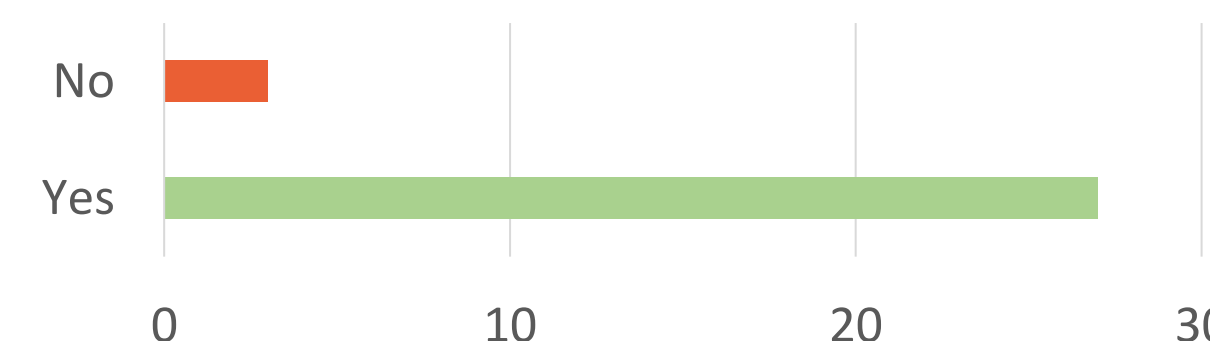| Survey Item (Scale: 1-10)	Mean Pre	SD	Mean Post	SD	t(29)	p	Cohen's d
Understanding of steps needed to perform a transfer?	3.57	2.65	8.77	1.17	-10.465	<.001	2.72
Ability to demonstrate how to facilitate a physical transfer?	2.87	2.75	8.73	1.17	-11.844	<.001	2.71
Ability to detect back strain while handling patient?	4.53	2.75	8.53	1.81	-9.049	<.001	2.42
Ability to elevate/depress the scapula?	4.83	2.73	8.93	1.44	-8.898	<.001	2.52

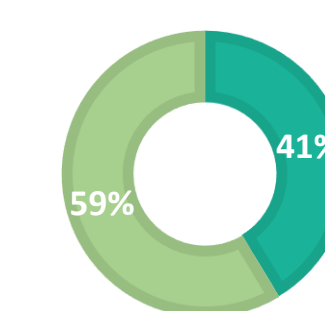PARTICIPANTS N= 30 (EL-OTD 87%, PP-Master's 13%)
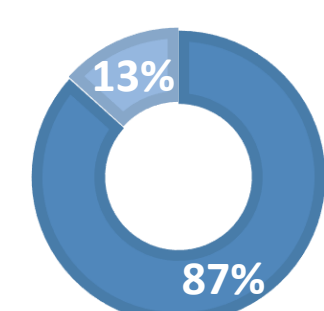
RESOURCE USE IMPROVED UNDERSTANDING OF MOTOR LEARNING METHOD (Yes / No)

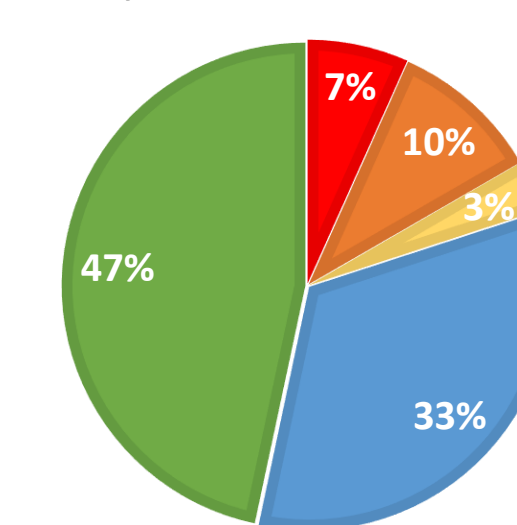PREFERRED MOTOR LEARNING METHOD (Verbal Cueing 59%, Exploration 41%)

USEFULNESS OF IMPLEMENTED EDUCATIONAL RESOURCES (Supplemental Videos, Transfer Self-Checklist, Scap Prep Self-Checklist, Transfer Decision Tree, Scap-Prep Decision Tree, Bed Mobility Decision Tree) — Not Useful, Somewhat Useful, Neutral, Moderately Useful, Very Useful
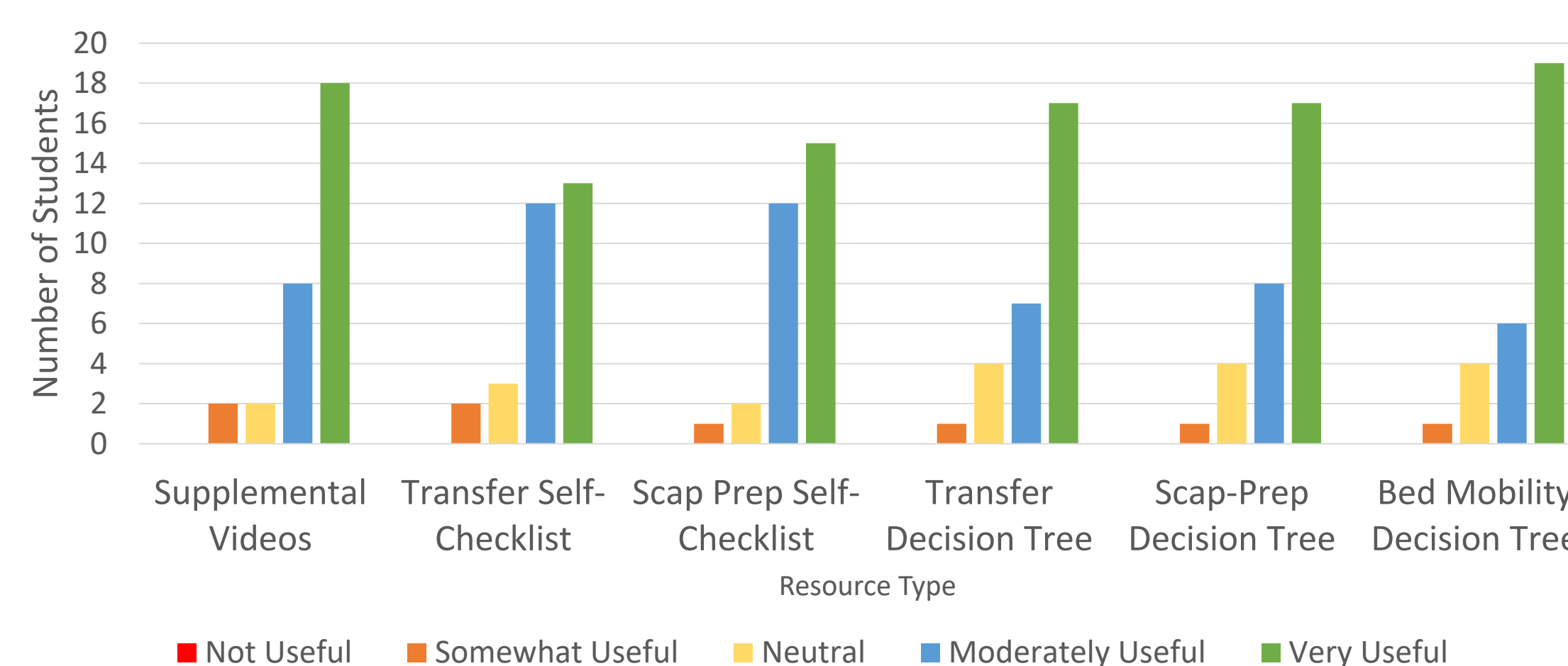
FUTURE RESOURCE USE (Not Likely 7%, Somewhat Likely 10%, Neutral 3%, Moderately Likely 33%, Very Likely 47%)

Discussion

STRENGTHS
- 95% of survey items showed statistically significant improvement in student confidence & competence with large effect pre to post resource exposure
- High student response to usefulness indicates success with embedding cueing, problem solving, clinical reasoning, & reflection into instructional materials
- 80% of students reported likeliness to use resources upon course conclusion
- Students also reported increased embodied knowledge via post-survey
- All students met transfer standards on their lab practical
- Resources appear to support student progression through the **Imitation, Manipulation, & Precision** phases of Dave's Psychomotor Taxonomy
- Universal Design for Learning (UDL) features in resources
- Resource implementation provided an observable increase in student problem solving, ability to articulate clinical reasoning, & personal reflection
- **Positive student responses and personal utilization of resources:**

  "Used when practicing the skill to ensure competency"
  "Used it [decision trees/flow chart] to check my thinking while practicing"
  "Recorded myself during scap-prep/transfers and went through the checklist after"
  "Used it [self-checklist] to maintain and observe my body mechanics"
  "They [resources] made me value hands on practice"
  "I'll refer [to supplemental videos] to correct my posture"
  "Used during class to aid in problem solving for cases"

- Due to high positive responses in resource usefulness content will be embedded as instructional material in course going forward

INSIGHTS FROM LAB INSTRUCTION
- To better encourage motor exploration: minimize number of verbal cues during demonstrations and keep number of cues consistent for each skill being practiced

Recommendations

COURSE SPECIFIC RECOMMENDATIONS
- Create instructions to accompany decision tree diagrams to better support navigation through the reasoning process
- Continued development & implementation of resources using UDL to supplement learning content
  - Development of decision tree for levels of assistance needed during functional transfers
- Investigate impact of KP & KR cueing on other course required physical skills
- Continue to utilize self-checklists & decision tree's during lecture to prompt here & now reflection & clinical applications
- Limit KP verbal cueing to 3-6 verbal cues per physical skill during lab demonstrations

BROADER RECOMMENDATIONS & FUTURE PROJECTS
- Follow-up survey 1year post to EL-OTD students (upon completion of Level II Fieldwork) to assess psychomotor skill progression
- Potential collaborations with Tufts OT faculty to implement decision trees into curriculum for other practice classes
- Future collaborations with Level II Fieldwork educators to explore KP & KR cueing on psychomotor skill development
- Potential collaboration with fieldwork educators on implementing learning resources such as decision trees & self-checklists with Level II students

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REFERENCES & EDUCATIONAL RESOURCES