



The Assessment of Learning Powered mobility use scale (the ALP tool)

— a new tool for evaluating power wheelchair use
and tracking progress over time

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independent researcher

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The Driving to Learn project

109 children and adults with cognitive disabilities

45 with profound degree – 12 months to 52 years

64 with other degrees – 16 months to 86 years

17 infants with typical development – 3 to 12 months

Clinical projects at paediatric rehabilitations, day centres for adults, special schools and primary health day care

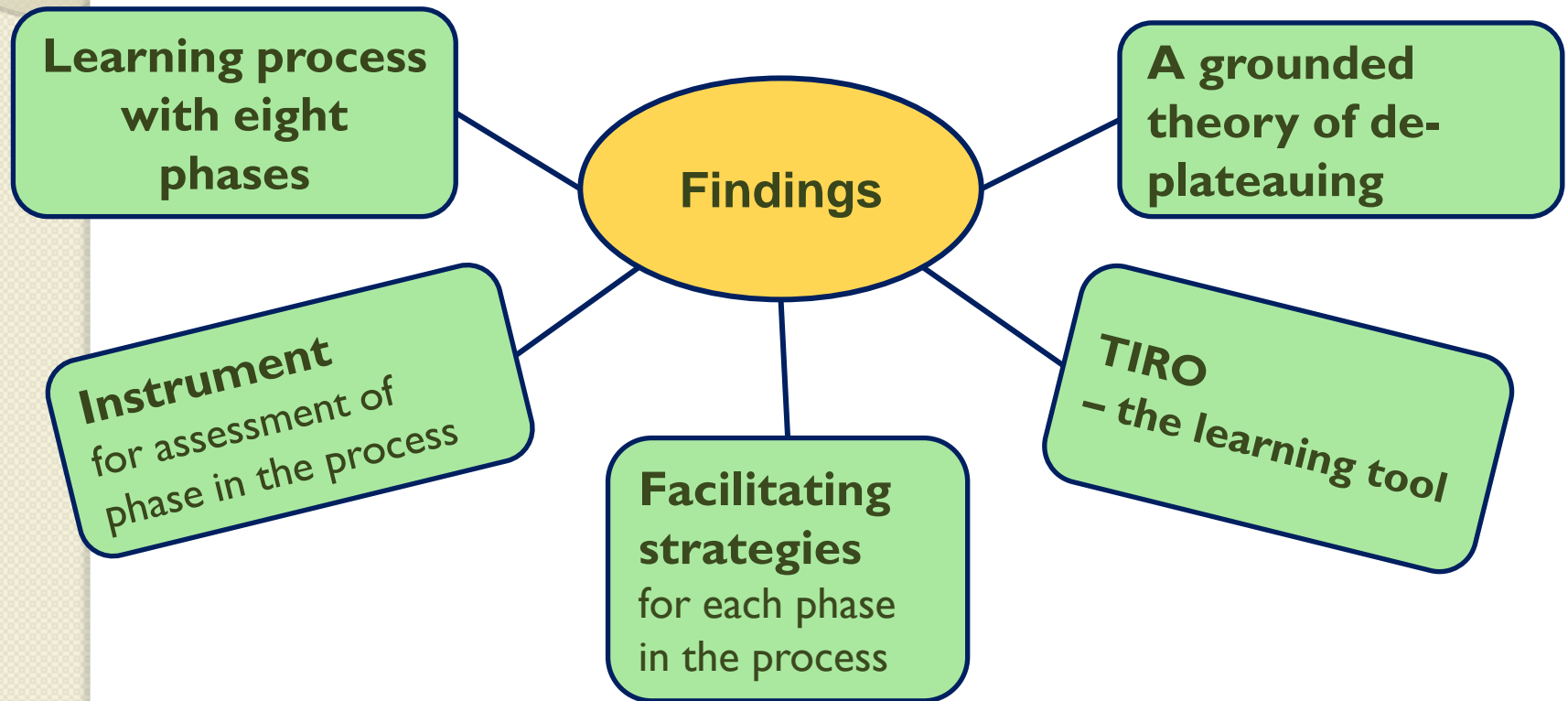


Typically developing infant 3 months





Driving to Learn – findings



Nilsson, L. (2007). Driving to Learn. The process of growing consciousness of tool use – a grounded theory of de-plateauing. Dissertation, Lund University, Lund, Sweden





C300TIRO – the learning tool

Design grounded in the findings
from the Driving to Learn project
Clinical testing of three prototypes

Predictable functions
Good learning properties
Stabilizing active position
A 'one-for-all' seating unit

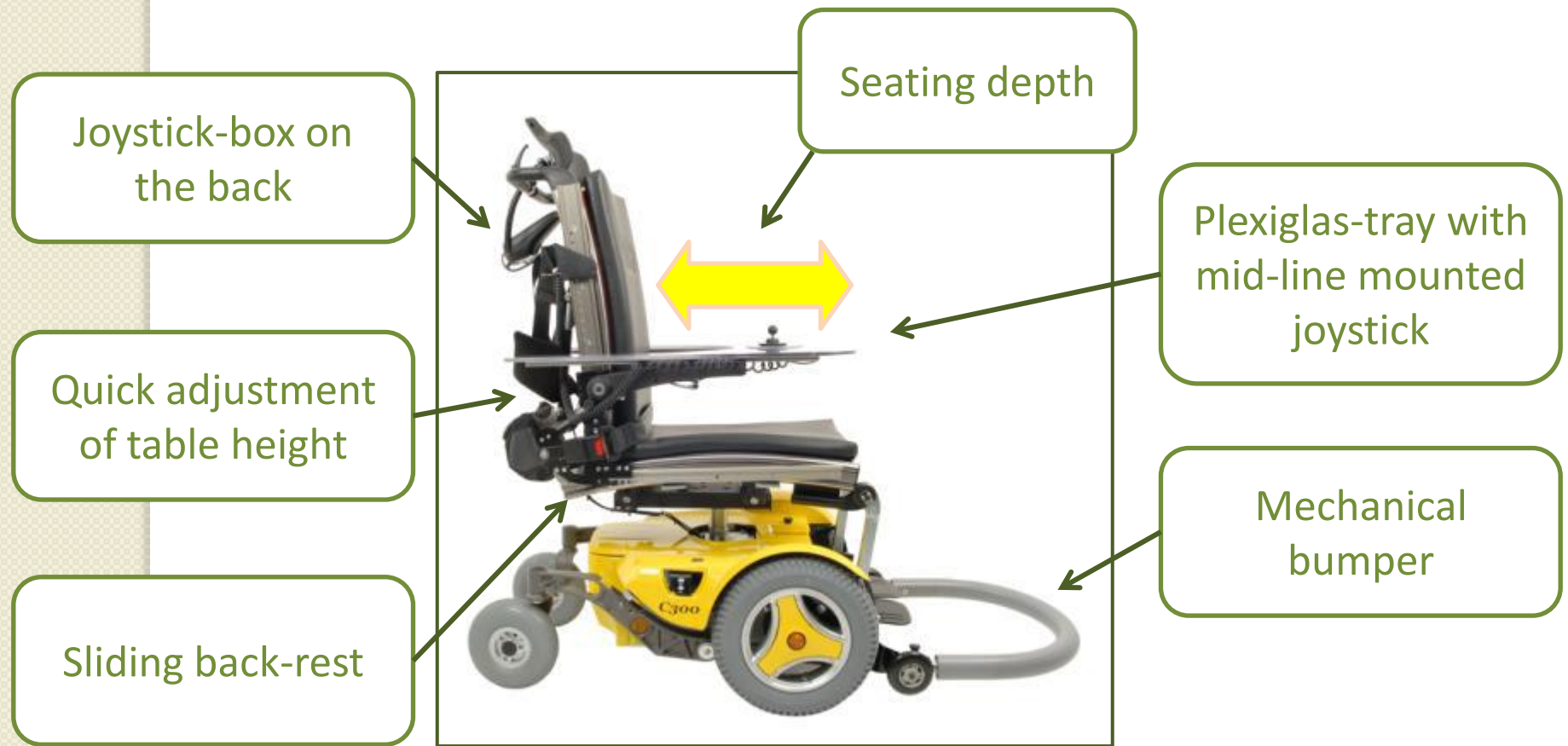
Developed in co-operation with
Permobil AB, Sweden and Permobil
Europe

Nilsson, L., & Eklund, M. (2006). Driving to Learn.
Powered wheelchair training for those with cognitive disabilities.
International Journal of Therapy and Rehabilitation, 13(11), 517-527.



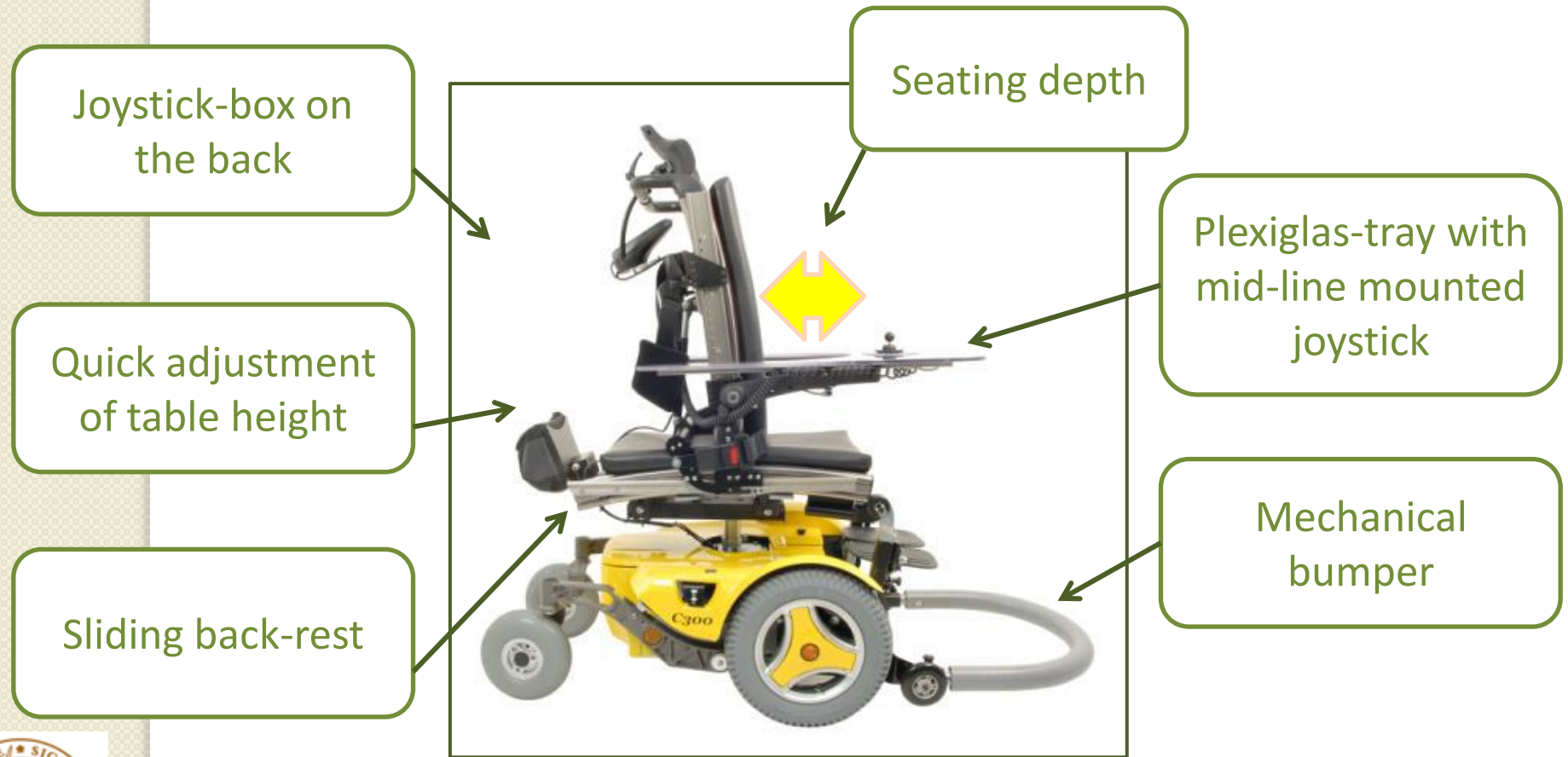


C300TIRO adjusted to ADULT size



- Quick and easy adjustment without using any tools

C300TIRO adjusted to CHILD size



- Quick and easy adjustment without using any tools

Infant nearly 4 months testing Tiro



Demonstration of Tiro at an assistance co-operative in Gothenburg, 2013

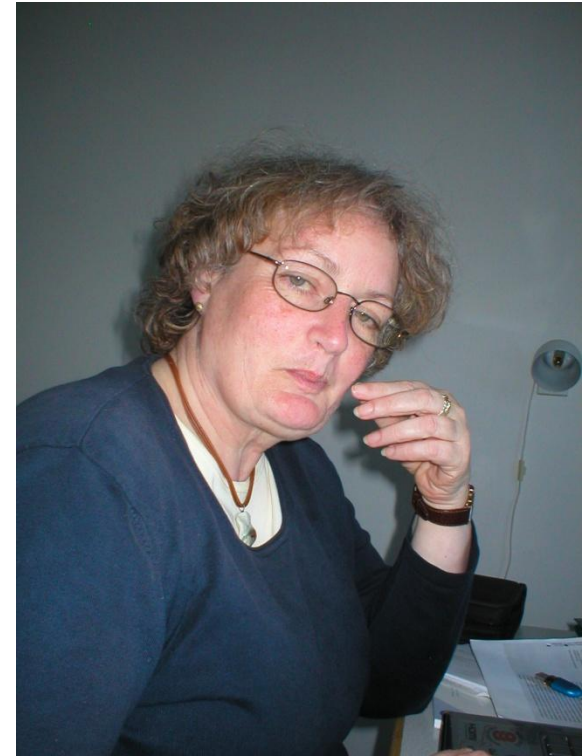
Assessment of Learning Powered mobility use (ALP)



THE ALP TOOL – TWO INSTRUMENTS THAT BECAME ONE



Josephine Durkin,
England



Lisbeth Nilsson, Sweden

The two researchers were connected by Roslyn Livingstone, Seattle, who compared their instruments and guidelines for practice:

Livingstone, R. (2010). A critical review of powered mobility assessment and training for children. *Disability & Rehabilitation Assistive Technology*, 5(6):392-400



Nilsson – “Driving to Learn™”

Lisbeth Nilsson, PhD, OT Reg.

Dissertation in 2007, Lund University, Sweden

Grounded theory:

A grounded theory of de-plateauing

Instrument:

‘Phases in the process of growing consciousness of joystick-use in a powered wheelchair’

Nilsson, 8 phases and 8 observational categories

Table 1. Phases in the process of growing consciousness of joystick-use in a powered wheelchair

	Activity form	Behavior - Activity	Hand and arm Movement	Consciousness of joystick-use	Alertness	Motive	Driving-style	Expression
8	Occupation, composed of two or more activities	Driving is a part of the occupation. A means for doing other activities.	Smooth and precise movements	Consciousness is focused on the other parts of the occupation. Driving more or less subconscious	Relaxed, active, not tense	Plan	Secure skilled navigation	Depending on the 'doing'
7	Occupation for its own sake	Driving is the solo activity. Drive for pleasure.	Well adjusted and timed movements	Aware of consequences and conscious of how to control the steering with the joystick	Generally focused	General goal	Mastery of steering	Happiness Satisfaction
6	Activity	Able to drive in a desired direction or to a goal.	Goal-directed but coarse movements	Conscious of the need for sequencing of the acts in a certain order to reach a desired point or place	Focused on the goal	Special goal	Goal-directed but unskilled	Serious Content Laugh Excited
5	Sequences of chains of acts	Experimenting with the joystick. Drive here, there, forward, backward.	Intentional more eager or violent movements	Conscious of the ability to cause many different effects, motion in different directions. Searching the steering pattern	Active, concentrated	Explore choices of effects	Experimental, explorative	Eager Smile Serious Frustration
4	Chain of acts	Investigation of more effects. Drive – stop – drive. Test different grips.	Intentional but precautions, careful movements	Conscious of more than one effect. Motion in different directions depending on how acts are combined	Attentive	Intention	Intentional, intended, destined	Serious Smile sometimes laugh
3	Act	Activate joystick get the effect of motion.	Distinct aimed movements	Conscious of how one act can cause one effect. Act starts motion.	Alert	Explore cause-effect	Self-initiated, voluntary	Serious Contented Smile
2	Pre-act	Touch or hit different parts of the chair. In-between sitting still.	Diffuse vague multi-directed movements	Pre-conscious of how a self-initiated act can cause the effect of setting the chair in motion	At times more alert Passive	Anticipation of an effect	Keep on driving after release of guidance	Contented Curious Anxious Angry
1	Reflexes, behaviors	May accidentally activate the joystick. Still for long periods.	No aim with the movements	Unconscious of how own activity can cause an effect	Passive	Excited-anxious	Guided or accidental	Neutral

Strategies facilitating learning

- Create trust and positive relationship
- Attract curiosity and motivation
- Mutual interaction
- Dialogic approach
- Response, comprehensible communication
- Adapted pace, situation and equipment
- Predictable tools and resources

Nilsson, L., Eklund, M., Nyberg, P., & Thulesius, H. (2011). Driving to Learn in a Powered Wheelchair: Identification of the Process of Growing Consciousness of Joystick-use in People with Profound Cognitive Disabilities. *The American Journal of Occupational Therapy*, Nov-Dec (65)6, 652-660.



Durkin – “Moving forward”

Dr. Josephine Durkin

Dissertation in 2006, Brighton University, England

Grounded theory:

A grounded theory of Responsive Partner

Instrument:

’Powered mobility assessment tool’

Appendix XI

Powered Mobility Assessment Tool

Component Skills	Novice	Advanced Beginner	Competent	Proficient	Expert
Has attained attention level 1	●				
Has attained attention level 2	●				
Has attained attention level 3		●			
Has attained attention level 4			●		
Has attained attention level 5				●	
Has attained attention level 6					●
Understands the concept of movement	●				
Exhibits a desire to begin to explore beyond the world of their tray		●			
Rational wheelchair driver has own goal in mind			●		
Concentrating on getting from A to B often ignores the environment and people around them			●		
Perceives the task of powered mobility as a whole				●	
Demonstrates fluid performance					●
Able to press a single switch, hold and release	●				
Understands 2 switches have different functions	●				
Chooses to operate forward switch		●			
Chooses to operate reverse switch		●			
Motivated to learn how the machine operates		●			
Understands the use of electronic mobility guidance systems		●			
Refining manoeuvring skills				●	
Consistent precision control of powered w/ch					●
Consciously deliberates a situation and performs their own judgement of how to resolve the situation			●		
Makes judgements based on prior concrete experiences				●	
Takes care of themselves within the powered w/ch				●	
Intuitively organises and understands the task they are encountering				●	
Takes care of others while driving powered w/ch				●	
Knows what to do based on mature and practiced understanding					●
Able to fully use the powered wheelchair as part of their everyday lifestyle skills					●
Adapts to many and varying environments					●
Highest Skill Achieved					
Overall Skill = Lowest Achieved					

Kommentar [31]: Attention
Stage Observed =

Kommentar [32]: Movement
Stage Observed =

Kommentar [33]: Operating machine
Stage Observed =

Kommentar [34]: Judgement
Stage Observed =

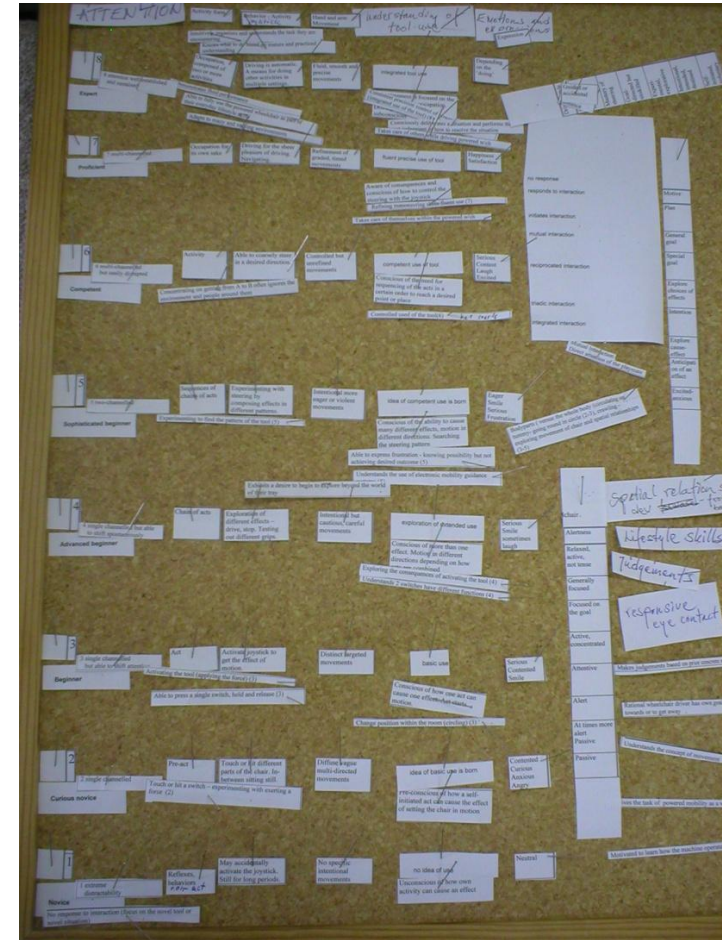
Kommentar [35]: Lifestyle skills
Stage Observed =

Durkin
5 phases and
6 levels of attention

The ALP tool

In 2009 Durkin and Nilsson merged, modified and expanded their two instruments.

The ALP tool encompass the ALP-instrument and ALP facilitating strategies



Nilsson, L., & Durkin, J. (In press). Assessment of learning powered mobility use – applying Grounded Theory to occupational performance. *Journal of Rehabilitation Research and Development*, expected in issue 6 this year.



PHASE	Activity & Movement	Understanding of tool use	Expressions & Emotions	Interaction & Communication	STAGE
8 Expert	Occupation, composed of two or more activities	Integrated tool use	Dependent on the doing of 'other' activities	Multi-level integrated interaction	EXTROVERT STAGE explore performance
7 Proficient	Occupation for its own sake	Fluent precise use of tool	Happiness Satisfaction	Concurrent interactions	
6 Competent	Activity	Competent use of tool	Serious Content Laugh Excited	Consecutive interactions	
5 Sophisticated beginner	Sequences of acts	Idea of competent use is born	Eager Smile Serious Frustration	Reciprocated interaction Triadic interaction	Difficult transition explore sequencing
4 Advanced beginner	Chains of acts	Exploration of extended use	Serious Smile Sometimes laugh	Mutual interaction	
3 Beginner	Act	Basic use	Serious Contented Smile	Initiates interaction	INTROVERT STAGE explore function
2 Curious novice	Pre-act	Idea of basic use is born	Contented Curious Anxious angry	Responds to interaction	
1 Novice	Excited Non-act Rejection	No or vague idea of use	Open Neutral Anxious	No response Avoidance	

Generic usefulness

The ALP tool can be used across

- Age
- Gender
- Diagnosis/disability
- Degree of cognitive disabilities
- Technology/machine/tool
- Culture

(And it can also be used with able bodied people who learn tool use)



How the ALP is different from other assessment tools

Used to assess the user's occupational performance in the powered wheelchair

Typically applied in real world settings but can also be used in controlled environments

Provides a measure of where the user is in the process of learning tool use

Provides strategies that facilitates progress in learning



The ALP instrument

Is used to assess:

Observed occupational performance in a real world situation in a specific environment

Actual phase in the learning process which is important to know to be able to give the "just right challenge" during practice

Progress in the individual's learning

The ALP facilitating strategies

Encompass:

- *General strategies for learning*
- *Strategies for each stage*
- *Strategies for each phase*

Is a set of recommendations and ideas that assist the facilitator in developing appropriate *individual* strategies that suites practice situation and environment

Using the ALP tool

- Identify the child's motivators, interests, goals and abilities/limitations
- Set the goals for powered mobility use in co-operation with child and family
- Define learning/performance goals
 - Basic use – phase 3
 - Competent use – phase 6

Those two definitions serve to set the definitions of the other phases
- Choose suitable situation, environment
- Set up the practice session for the individual



Approach for a novice user

- Trial in a learning friendly environment
- Even surface
- Indoors
- Smaller room/space
- A situation with contrasts, different colours and lights
- Encourage intuitive explorations - accidental, intended, aimed to systematic

Article about the ALP in press

Nilsson L., & Durkin, J. (in press) Assessment of learning powered mobility use – applying Grounded Theory to occupational performance, *Journal of Rehabilitation Research and Development*, Volume 57, Issue 6

The ALP tool (instrument and facilitating strategies) will be available as downloads at the journals home page www.jrrd.com

Where to find more information

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ResearcherID = A-8370-2012

Video clips from practice:

Hillevi 22 år

Leo 4 years

Olof 12 years