

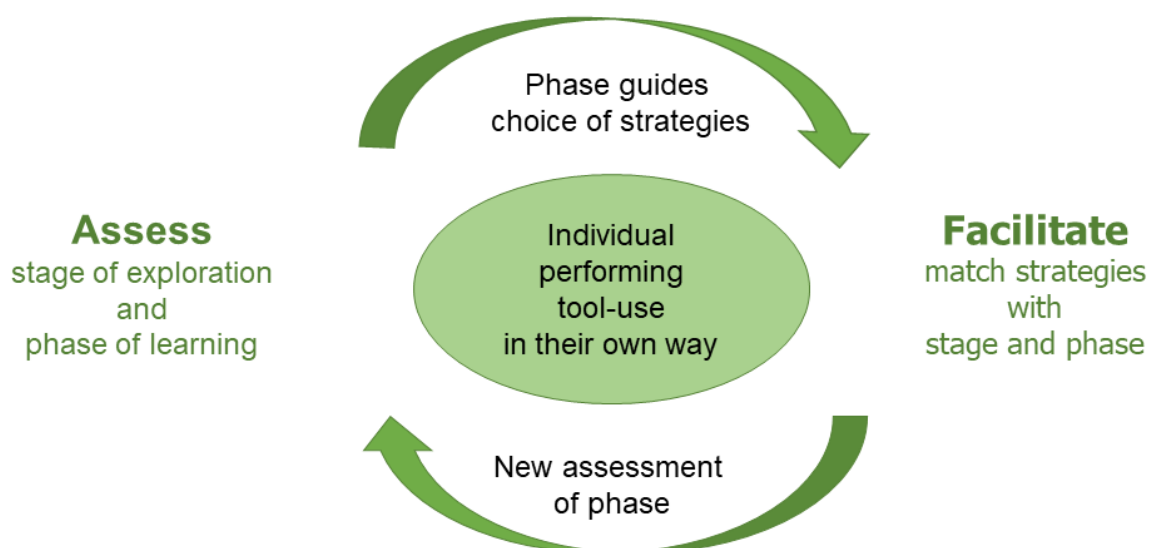
# Guide for application of the ALP-tool

This guide was written for the universal Assessment of Learning Process (ALP) but the principles for application are the same for the ALP-tool, version 2.0 and ALP for AAC (Augmentative and Alternative Communication). The ALP-tool includes the **ALP-instrument** and the **ALP-facilitating strategies** (see <http://lisbethnilsson.se/en/alp-tool> for separate files with full text, for each version).

The guide begins with an introduction of the ALP-tool, the tool-use learning process the development and structure of the learning process and the facilitating strategies. Then the principles for application of the ALP-tool are described together with some practical advices. The guide will continuously be refined and updated in response to feedback and questions from users of the ALP-tool. The first version was uploaded 18<sup>th</sup> of July 2023 and this second version was uploaded on 29<sup>th</sup> of April 2024.

## Introduction of the ALP-tool

Application is a continuous circular process



## The ALP-tool is used to support tool-use learning

Tool-use learning is an integral part of developing human behaviour (Nilsson & Durkin, 2017). Human behaviour involves using tools in a variety of activities. Knowledge of the tool-use learning process makes it easier to facilitate learning in others who are beginning to learn or re-learn to use a tool. This guideline explains the ALP's process-based nature, how the universal learning process was discovered, and the principles of applying the ALP-tool. The ALP-instrument is used to identify the child's or adult's starting-point for learning as knowing where the individual is in the process of tool-use understanding guides which ALP-facilitating strategies can best promote further learning.

The ALP-tool includes the ALP-instrument and the ALP-facilitating strategies, and it can be used to support growing consciousness of any activity involving tool use (Nilsson & Durkin, 2014, Appendix 1 and 2). Tools are defined in a broad sense as the body and/or parts of body and mind, as well as a variety of external objects, artefacts, and technologies. Tool use can range from simple to complex, for example using hand tools such as spoons for self-feeding or complex tools such as smart phones for communication, or technologies for mobility and work. The individuals who learn tool-use may range in age from very young infants to very old adults and have widespread diverse combinations of physical, cognitive, and social abilities. Any human being can be a beginner in learning of new tool use behaviours and start the learning process as a novice tyro learner. (Nilsson & Kenyon, 2022).

Tool-use learning is dynamic and tool-use understanding is constantly changing across the life span. Some tool-use skills you retain throughout life and others you cease to use, or you learn and re-learn. Some tools you learn about how to use just about competently, while with others, you become an expert user. It all depends of your motivation, needs, and circumstances related to your life-trajectory.

## The process-based nature of the ALP-tool

The ALP-tool is used for assessment and facilitation of tool-use learning (Nilsson and Durkin, 2014; Field and Livingstone, 2018). It can be applied in any context involving growing consciousness or learning of how to use a tool. Its process-based nature allows for application with children or adults, who are able-bodied or have impairments, and who uses any kind of tool in any situation or activity.

Growing consciousness of tool-use (Nilsson, 2007; Nilsson et al., 2011 a) or tool-use learning (Nilsson and Durkin, 2014) is a basic social process. The eight-phase process was discovered and modified in Classic Grounded Theory research carried out by two occupational therapists. This methodology analyses behaviour and search for patterns of behaviour explaining what is going on in the studied situation. The assessment focus on observing indices of behaviour that indicate which phase of tool-use understanding a child or adult are at in the moment. The indicators or characteristics in performance are the same independent of person or tool-use activity. The benefits of looking for characteristic behaviours and patterns, are that it can be done with any activity of the individual's preference, in any place of their choice or availability, and involving any circumstances that may promote their motivation to act and sense trust and security in the tool-use situation (Nilsson and Durkin, 2017, Nilsson and Kenyon, 2022, Modh, Ohrvall and Nilsson, 2023).

## Identification and universality of the tool use-learning process

The discovery of the learning process started with a study involving two pre-school children with profound intellectual and multiple disabilities. The research question was what they could achieve from practising in a joystick-operated powered wheelchair. Their outcomes during their first year of regular practise at a paediatric rehabilitation centre was surprisingly positive. Therefore, the study evolved into the Driving to Learn project (Nilsson and Nyberg, 2003). Classic Grounded Theory methodology was adopted and more participants were engaged one after the other as new hypotheses emerged. The field of study was children and adults with profound cognitive disabilities, but it was challenging to recognise patterns of

behaviour changes indicating achievements in this population. One way to solve this issue was to engage typically developing infants, ages 3-12 months, in testing a joystick-operated powered wheelchair (Nilsson and Nyberg, 1998). As the typical development of infants was thoroughly researched, their patterns of behaviours in the powered wheelchair, was reliable to use as a reference for comparison with similar behaviours in the other participants. Another way to support the emerging pattern of phases in the learning process was to engage participants in different ages that had severe, moderate, or mild cognitive disabilities. Finally, emerged an eight-phase process of growing consciousness of joystick-use with indicators that were observed in all participants, despite of their diversity in age, abilities, causes of impairment, gender, or culture. When the Driving to Learn dissertation was presented, it had become obvious that those who learned how to apply the Driving to Learn intervention also went through the same eight phases of learning (Nilsson, 2007 pp 35-36). That insight furthered the idea of the learning process being universal and therefore possible to apply with simpler tools such as a spoon for self-feeding or more complex tools such as computer-based devices for alternative or augmented communication.

## Modifications and expansions into the ALP-tool

Thanks to Livingstone (2010), who in the preparation of her article compared the works of Durkin (2006, 2009) and Nilsson (2007), the two were connected and began their collaboration. They carried out a merging and modification of their findings in previous studies of children and adults with cognitive disabilities practising self-produced powered mobility (Durkin and Nilsson, 2010). The studies they separately presented in 2006 and 2007 were carried out over a very long time period and included a wide variety of participants. The re-analysis of their data led to conceptualising the learning process at a higher level of abstraction and an expansion of the facilitating strategies (2014 and 2017). Thereby, the identified eight-phase learning process was strengthened and together with the facilitating strategies it became process-based in its nature. The benefit of the ALP compared to task-based assessments is that it covers the full continuum of the learning process from novice to expert tool use in any human being (Nilsson and Kenyon, 2022).

In 2017, when Nilsson initiated collaboration with speech-language pathologists, the universality of the ALP-tool was completed by removing all indicators referring to powered mobility use. The outcome of the collaboration was a specific ALP for AAC (ref to webpage n.d. <https://www.alpforaac.com/>). However, the universal ALP-version was later translated into Swedish and applied in a study of persons with profound intellectual and multiple disabilities learning to use a switch-operated system for self-produced mobility (Modh et al, 2023). Requests have been made for the development of ALP for other tools, such as stepping devices, but this idea falls as you cannot develop a separate ALP for each kind of tool.

Most important when applying the universal ALP with a new tool is to elaborate on and consider what may be characteristic behaviours that indicate tool-use understanding for each of the eight phases of learning to use a specific tool in an activity. This elaboration makes you familiarized with what to look for in each of the observational categories and help differentiate the eight phases in the learning process. It also nurtures an internal image of what behaviour to observe which enhances your sensitivity to recognize changes in a person's tool-use behaviours that indicates their changed tool-use understanding.

## Applying the ALP-tool

The main purpose is to apply the ALP-tool **for** learning and growing consciousness of tool-use. Assessing a child's or adult's actual phase in the learning process is done to determine the person's understanding of tool-use. You assess the person's actual understanding to be able to tailor the practice situation and facilitation, so it matches the person's specific abilities, needs, and motives. If you can match understanding of tool-use with the appropriate facilitating strategies – the person can be provided with a challenge that is just right to support their growing consciousness of tool use.

Application of the ALP involves using the facilitating approach, tailoring the tool-use situation for the person, observing behaviours and assessing phase of learning, and noting and responding to oscillation across phases of learning

## The ALP-instrument

The ALP-instrument illustrates the eight phases of learning with indicators in five observational categories characterizing each phase in the process (Table 1). The eight phases are divided into three stages of exploration: explore function, sequencing, and performance. The instrument is used to assess an individual's actual stage of exploration and phase of tool use understanding.

**Table 1.** ALP-instrument, structure, and concepts

| Phases of learning | Five observational categories |                     |                           |                        |                             | Stages of exploration   |
|--------------------|-------------------------------|---------------------|---------------------------|------------------------|-----------------------------|---|
|                    | Attention                     | Activity & movement | Understanding of tool use | Expressions & emotions | Interaction & communication |   |
| 8                  | indicators                    | indicators          | indicators                | indicators             | indicators                  | 3<br><b>Explore Performance</b><br>Body, tool/s, environment & occupation |
| 7                  | indicators                    | indicators          | indicators                | indicators             | indicators                  |   |
| 6                  | indicators                    | indicators          | indicators                | indicators             | indicators                  |   |
| 5                  | indicators                    | indicators          | indicators                | indicators             | indicators                  | 2<br><b>Explore Sequencing</b><br>Body, tool/s & environment              |
| 4                  | indicators                    | indicators          | indicators                | indicators             | indicators                  |   |
| 3                  | indicators                    | indicators          | indicators                | indicators             | indicators                  | 1<br><b>Explore Functions</b><br>Body & tool/s                            |
| 2                  | indicators                    | indicators          | indicators                | indicators             | indicators                  |   |
| 1                  | indicators                    | indicators          | indicators                | indicators             | indicators                  |   |

## Inter-rater reliability of the ALP-instrument

The original eight-phase process of growing consciousness of joystick-use was tested for inter-rater reliability with very good kappa value (0.85) (Nilsson et al., 2011 b). Version 2 of the ALP-instrument reached the same kappa value when tested by Svensson and Nilsson (2021). When the universal ALP was tested for inter-rater reliability with persons with profound intellectual and multiple disabilities using a system for self-produced mobility, it gave a moderate kappa value (0.50), which was considered good as testing assessment reliability with this population typically gives lower values (Modh et al., 2023).

## The ALP-Facilitating strategies

The facilitating strategies provide guidance for how to support learning at each stage and phase of the learning process (Table 2). The choice of facilitating strategies is based on observed tool-use behaviour and determined phase of tool-use understanding. The goal for assessment and facilitation is to support the individual in developing a higher level of tool-use understanding. Each individual has their own learning dynamic and will demonstrate their own unique learning pattern. Our recommendation was to use the ALP-tool for assessment and facilitation for an expanded range of tool use behaviours and activities in human behaviour.

**Table 2.** Facilitating approach and ALP-facilitating strategies

| <b>FACILITATING APPROACH</b>               |   |  |   |
|--|---|--|---|
| Trustful relationship                      |   |  |   |
| Curiosity and motivation                   |   |  |   |
| Mutual interaction and dialogue            |   |  |   |
| Response, understandable communication     |   |  |   |
| Adjusted pace, equipment and situation     |   |  |   |
| Useful and predictable tools and resources |   |  |   |
| <b>Phases of learning</b>                  | <b>Specific strategies for each of the phases</b> | <b>Stages of exploration</b>   | <b>Specific strategies for each of the stages</b> |
| 8  | strategies  | <b>3</b><br><b>Explore Performance</b><br>Body, tool/s, environment & occupation | strategies  |
| 7  | strategies  |  |   |
| 6  | strategies  |  |   |
| 5  | strategies  | <b>2</b><br><b>Explore Sequencing</b><br>Body, tool/s & environment              | strategies  |
| 4  | strategies  |  |   |
| 3  | strategies  | <b>1</b><br><b>Explore Functions</b><br>Body & tool/s                            | strategies  |
| 2  | strategies  |  |   |
| 1  | strategies  |  |   |

## Using the facilitating approach

The facilitating approach is used to support and encourage the person's own initiative to find out 'what is this?' 'how do I get an effect?' 'how can I make it work?'. Demonstrate and stay back, wait for the person to act and interact – allow them to reflect over their experiences and support their new attempts to act. Use dialogue to ask questions, explain, confirm, and reflect on experiences and outcomes of tool-use behaviour. Adjust facilitation to the individual abilities, allow own initiatives, encourage exploration and co-construct the practice situation (Figure 1).

The ALP approach embraces the following guiding principles for assessment and application of facilitating strategies:

### Building trust and partnership with the person through dialogue

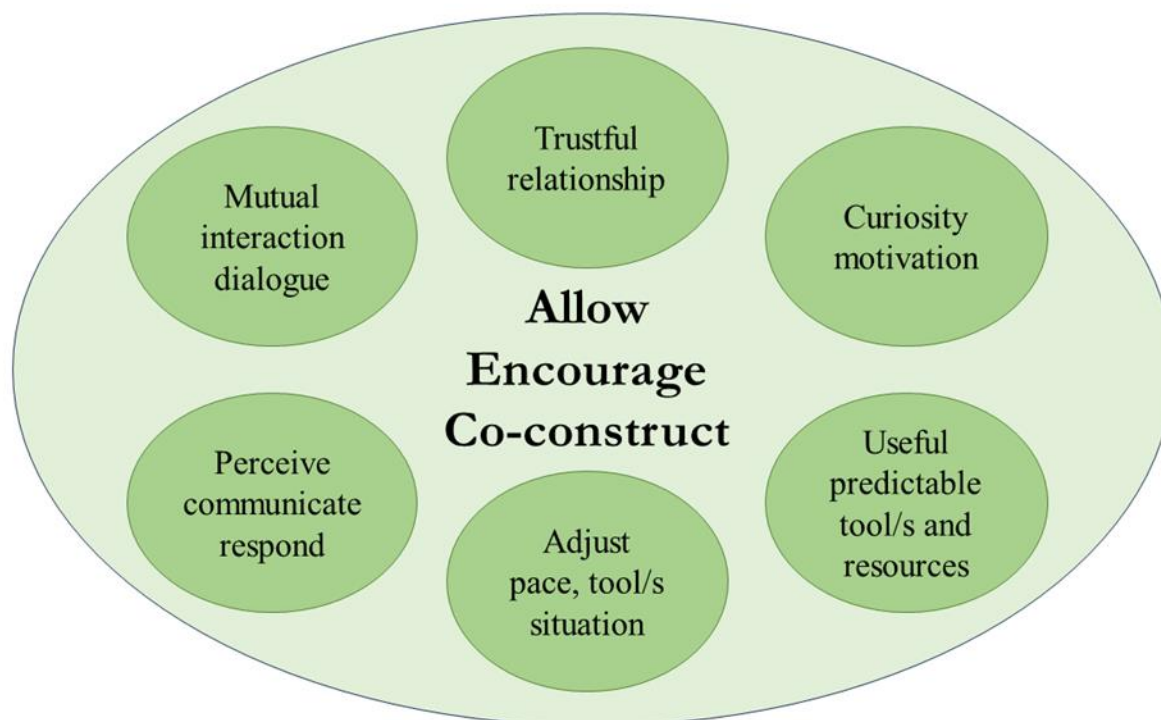
- build a trustful relationship and sense of safety in the situation
- explore the person's abilities, needs, and motives
- be attentive; listen and observe vigilantly and respond aptly to interaction
- be aware of how your interaction and communication is interpreted by the person
- use language/non-verbal communication that suites the person - adjust words, body language, facial expressions, signs, content, volume, tone, and emphasis
- strive for mutual interaction and communication
- support problem-solving and understanding with appropriate information, instruction, and questions

### Empowering the person by intertwining tailored practise with new challenges

- adapt the situation and strategies to meet the person's actual tool-use understanding
- adjust the activity to the 'just right level of challenge' for the person
- adapt facilitation to meet the person's drops and peaks in understanding – (i.e., oscillation over phases in the learning process)
- increase complexity of tool-use activity
- introduce tool-use in new situations
- introduce tool-use in social settings or group activities

### Involving the person in co-construction of the practise situation

- encourage the person's initiatives and choice of activity
- allow trial and error to find working patterns for tool use
- allow the person to take the lead of the activity
- encourage the person to test their own ideas of problem-solving
- allow the person to use the tool in more challenging and unpredictable situations and environments



**Figure 1.** Adjust facilitating approach so it matches individual abilities, needs and desires

## Internalizing a mental image of the learning process

It is important to familiarize yourself with the learning process by combining your study of the ALP-instrument with reflections on your own learning experiences, or others learning experiences, that you can see in your everyday life. This reflection helps in becoming more acquainted with the structure and concepts in the ALP-tool. By applying the indicators of phases and stages to your own behaviors and performance of tool-use, it becomes easier to understand what to look for in others' tool-use performance.

When reflecting on your own experiences, begin with thinking of the three stages of exploration. What did you do to find out the *functions* of the tool? How did you try to *sequence* acts and actions to make it work the way it is intended to work? How did you integrate *performance* of tool-use in your everyday occupations?

There are some characteristics in tool-use behaviours that work as indicators for the stages of exploration. These indicators are related to alertness and attention span, finding out what the tool is used for (functions), understanding how to use it in the way it was meant to be used (sequence) and where and when to integrate tool-use in everyday life (perform) (Table 3). These indicating characteristics are universal and can be observed in any person who explores function, sequencing, or performance of any kind of tool use.

Becoming familiar with what tool-use behaviours to look for at each stage of exploration will guide you in identifying the stage. Knowing the stage will guide you in which phases of learning to begin looking for indicators. Familiarising with a few phases of learning at a time makes it easier to identify which indicators in tool-use behaviour to look for in each of the eight phases of learning.

**Table 3.** Universal characteristics indicating stage of exploration

| Observed tool use behaviour           | Stage 1<br>Phases 1-3                             | Stage 2<br>Phases 4-5  | Stage 3<br>Phases 6-8   |
|---------------------------------------|---|--|---|
| Exploratory behaviour                 | Exploring Functions                               | Exploring Sequencing   | Exploring Performance   |
| Using physical force and mental power | <i>Exert</i><br>To grasp object or thoughts       | <i>Exert and grade</i><br>To handle or elaborate in a working way    | <i>Exert, grade, and direct</i><br>To attain an outcome, reach a goal |
| Focusing, attention span              | Focus one thing at a time<br>Short attention span | Can focus attention on different things<br>Increasing attention span | Able to focus on multi-tasking<br>Attention adjusted to task demands  |
| Understanding of tool use             | Developing basic tool use                         | Developing competent tool use  | Developing integrated tool use  |
| Outcome                               | Finding out WHAT the tool is used for             | Finding out HOW to sequence a working pattern                        | Finding out WHERE and WHEN to use it                                  |

With increased familiarity with the structure of the learning process comes the internalization of an image of the learning process as a mental grid of the stages and phases and their indicators. To begin with, focus on the most prominent indicators of the three stages. Then focus on what are the most distinguishing or differential for the eight phases. Developing a detailed mental grid enables observation and assessment of tool use behaviour in the moment and on the go, without having to have the ALP-instrument in reach.

### Imagine tool-use behaviours indicating understanding of different tools

To nurture the development of a mental image of the learning process, you can elaborate on what tool-use behaviour in a specific situation may look like in the different phases of the process. You can use examples from your own experiences, or from observing infants or other persons learning experiences. Think of typical tools in everyday life, used by yourself, infants, or persons with disabilities. To begin with focus only on *three anchor points* in the learning process and elaborate on what tool-use behaviour indicates understanding of *basic tool-use* (phase 3 – understanding what the tool is used for), *competent tool-use* (phase 6 – knowing how to sequence a working pattern of actions), and *integrated tool-use* (phase 8 – knowing where and when to use the tool).

Also, think of who the tool-user is and what is their goal of learning. Here is just provided three examples of a *simple*, a *more complex*, and a *complex and abstract* tool, to give food for thought (Table 4-6).



**Table 4.** Using a **simple tool** such as a spoon with the individual goal to learn self-feeding

| Stage                    | Phase | Tool-use understanding | Tool-use behaviour indicating understanding  |
|--------------------------|-------|------------------------|--|
| 3<br>Explore performance | 8     | Integrated tool-use    | Can direct movement and grade force to self-feed different foods with precision          |
|                          | 7     |                        |  |
|                          | 6     | Competent tool-use     | Can load and transport the food to the mouth without dropping it                         |
| 2<br>Explore sequencing  | 5     |                        |  |
|                          | 4     |                        |  |
| 1<br>Explore function    | 3     | Basic tool-use         | Can grasp and hold the spoon handle, can point the spoon blade aiming at food on a plate |
|                          | 2     |                        |  |
|                          | 1     |                        |  |

**Table 5.** Using a **more complex tool** as a manual wheelchair with the individual goal to learn driving indoors

| Stage                    | Phase | Tool-use understanding | Tool-use behaviour indicating understanding   |
|--------------------------|-------|------------------------|---|
| 3<br>Explore performance | 8     | Integrated tool-use    | Can navigate in spaces with furniture and in narrow spaces, how to use the wheelchair in other activities |
|                          | 7     |                        |   |
|                          | 6     | Competent tool-use     | Can combine acts of pushing and pulling on the wheels to turn and move the chair to reach a goal          |
| 2<br>Explore sequencing  | 5     |                        |   |
|                          | 4     |                        |   |
| 1<br>Explore function    | 3     | Basic tool-use         | Can grab and pull/push the rings on the wheels to make the chair move in any direction                    |
|                          | 2     |                        |   |
|                          | 1     |                        |   |

**Table 6.** Using a **complex more abstract tool** such as a smart phone with the individual goal to learn text messaging

| Stage                    | Phase | Tool-use understanding | Tool-use behaviour indicating understanding  |
|--------------------------|-------|------------------------|--|
| 3<br>Explore performance | 8     | Integrated tool-use    | Can use text messaging with new contacts, sending to multiple receivers, text with multiple purposes |
|                          | 7     |                        |  |
|                          | 6     | Competent tool-use     | Can create and send a text message to a person in the contact list                                   |
| 2<br>Explore sequencing  | 5     |                        |  |
|                          | 4     |                        |  |
| 1<br>Explore function    | 3     | Basic tool-use         | Can find and open a received text message  |
|                          | 2     |                        |  |
|                          | 1     |                        |  |

## Tailoring the tool-use situation to a “just right challenge”

Persons who learn tool-use may range considerably in age, abilities, needs, and motives for learning how to use a specific tool. Therefore, gaining personal knowledge of each individual's preferences is important to be able to find and create a tool-use situation that is acceptable and appropriate for the individual. Adjusting and tailoring the situation encourages tool-use behaviour and optimizes opportunities for observing indicators of tool-use understanding.

It is important to continuously observe whether the challenge the person is experiencing in the tool-use situation is just right, too low, or too high. If it is too low, it might be experienced as boring, and if too high, it might be experienced as frustrating or causing anxiety. In both cases, it might result in a shutting-down of explorative behaviours and activity.

The following bullet points gives some advice on considerations to make for each individual and the setup of the practise situation.

- Allow the person to build their own tool-use sequencing patterns (phases 4-5) in a familiar situation before introducing new or more complicated situations.
- The person needs to be able to understand the idea of competent tool use before exploring how to integrate tool-use performance in unfamiliar situations.
- The person needs to learn about a variety of real-life relationships in safe, structured and framed contexts (bodily, physical, spatial, timing, social).
- Exploring tool use in a new situation puts higher demands on the person's attention regulation, such as sharing or shifting attention, and multi-tasking.
- Consider how the person's individual abilities and tool-use understanding may match demands and affordances of a new situation, i.e., visual perception, ability to understand symbols, need for visual contrast and lighting.
- Tool use exploration in well framed environments indoors is easier than in less distinctively framed natural context outdoors, i.e., boundaries indoors are more defined and easier to spatially relate to than boundaries outdoors that are undefined and more distant.
- A tool-use situation affording synchronizing body movement with a tool-use outcome is more demanding as it involves more forces to react to and interact with, i.e., using a spoon for self-feeding, stepping devices, powered mobility devices, equipment for down-hill skiing.
- A tool-use situation involving interaction and communication with unfamiliar people in new situations increases the demand for attention-regulation, i.e., using a device for Augmented and Alternative Communication (AAC) with an unfamiliar person in a shopping mall.

## Assess, facilitate and determine stable phase of learning

### Ongoing observation and assessment of phase in the moment

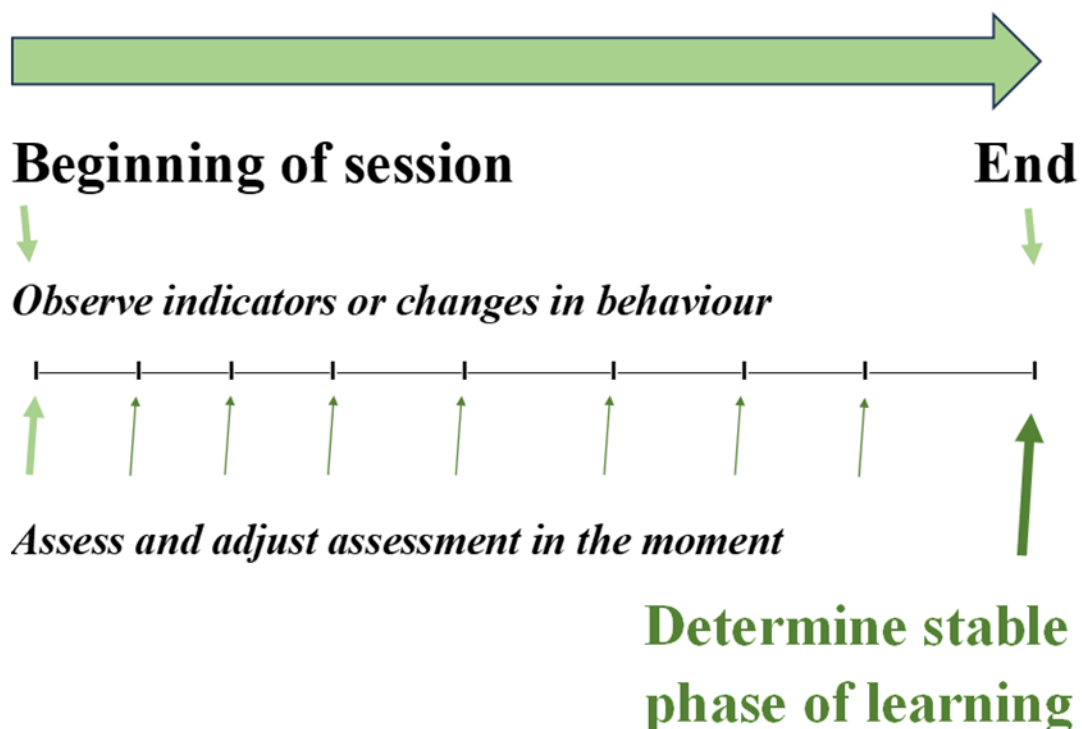
Look for behaviour matching the indicators in the five observational categories. Observation of engagement in a tool-use situation involves an ongoing observation of tool-use behaviours in the moment. From the beginning to the end of a practise situation, continuously **look for indicators and changes in behaviour** related to tool-use.

Make **assessments in the moment** when observing a new behaviour or a change in patterns of behaviour. Use your internal image of the ALP stages and phases to assess and make mental-notes of actual stage of exploration (exploring functions, sequencing or performance) and phase of learning.

Re-call mental-notes and reflections on observed behaviours and changes in the individual's alertness, pace of use, and patterns of understanding across the situation, when determining a person's **most stable phase** of tool use understanding.

### Adjusting facilitation to match a person's state and phase of learning

The continuous assessment of stage of exploration and phase of learning guides the choice of matching facilitating strategies. **Adjust facilitation** so tempo and strategies match the person's state of attention and eventual oscillation across stages or phases during a session.



**Figure 2.** Observe tool-use behaviour and assess phase of tool-use learning in a practise situation.

## Determining stable ALP phase at the end of each practise situation

At the end of a practise situation, use the ALP-instrument to mark-up indicators recognized across the situation. Consider if and how indicators are spread over phases and reflect on patterns in relation to when and how often the indicators were observed from beginning to end of the tool-use situation. *If the pattern is scattered over two or more phases it reflects oscillation over phases.* Finally determine which stage and phase represents the individual's most stable understanding of tool-use during the practise situation.

## Noting oscillation across ALP-phases of learning

Observations of changed or new tool-use behaviour indicates changes in the phase of tool-use understanding. When marking-up indicators in the ALP-instrument, it can become evident that the pattern of indicators is scattered over two or more phases of learning. This indicates that understanding of tool-use has changed from one phase to another, or oscillated in a rising and falling pattern across the practice situation.

The oscillation is due to many factors including a drop in energy, motivation, or attention. Oscillation is a common observation and raising and falling patterns across phases of learning look similar in all stages of exploration. However, some oscillation patterns are specific of Stage 1 and Stage 3. The most marked difference between these stages is the rate of recovery. The tempo for restoration or retrieval will take longer in the lower Stage 1 compared to the higher Stage 3.

### Stage 1: Explore Functions

- Short periods at highest level of performance
- After energy/motivation/attention drops, there will be low retrieval back to highest level
- *Be aware: it is easy to give too low a challenge*

### Stage 3: Explore Performance

- Long periods at highest level of performance
- After energy/motivation/attention drops, there will be quick restoration to highest level
- *Be aware it is easy to give too high a challenge*
- *Look at causes for dropping performance*

## Responding to oscillation in tool-use understanding

It is important to stay vigilant to recognise eventual oscillation and to be able to accommodate facilitation to a level that matches peaks or drops in understanding of tool-use. As mentioned, changes in a person's energy level, motivation, and attention may cause oscillation in tool-use understanding. Knowing the possibility of oscillation calls for continuously looking for changes indicating drops or peaks in understanding. It is important to be prepared to instantly alter the challenge to an easier or a more complex use of the tool, thereby matching the challenge with the person's tool-use understanding and abilities.

*If oscillation show a drop of tool-use understanding*

- First allow recovery by pausing tool-use behaviour, but stay in the situation and be reassuring.
- A pause of a few minutes may be enough for the person to recover attention and phase of tool-use understanding

*If oscillation shows either a falling or a raising pattern of tool-use understanding*

- Alter speed, pace or tempo – *down* – decreased challenge, *up* – increased challenge
- Alter complexity in synchronizing tool-use behaviours – *reduce* – decreased challenge, *add* – increased challenge
- Alter demands for interaction with the physical and social environment

## Considering other aspects of the practise situation

Other aspects to consider are whether to facilitate only one-to-one or do it in a group or a workshop, whether to use the original or alternative or adapted tool/s, and in the case of tools that can be used with joystick – why it is magic compared to other access methods

## Using group situations or workshops

Establishing a group for the person to practise tool-use within, needs careful consideration and ongoing reflection. The number of persons and facilitators working within the group at any one time will impact the dynamics of the learning situation. Each person needs to be assessed individually to determine how they cope within a multi-level interaction situation.

### Stage 1: Explore Functions

Persons in phase 1 (Novice) to 3 (Beginner), may need one-to-one support and may find it difficult to focus attention and reflect in a group.

### Stage 2: Explore Sequencing

Persons in phase 4 (Advanced beginner) and phase 5 (Sophisticated beginner) can benefit from being part of a parallel group where learners and facilitators are working together in a situation, but there is no expectation for multi-level interaction; the space is large enough to allow areas of tranquillity. In this stage the person will need to spend time on their own out of the group and can benefit from spending some time just observing other learners.

### Stage 3: Explore Performance

Persons need to have reached phase 6 (Competent) before they can practise and be attentive within a group setting. Their main activity focus at this level is to use the tool purposefully (or be goal-directed in their behaviour) and they often ignore people around them. A group environment can be used to gradually introduce development of multi-level interactions and awareness of others.

Facilitators need to be aware that tool-use practise in a multi-level interaction environment is harder to supervise and guide. Persons may display intense emotions particularly in respect to experiencing frustration and developing their own judgments towards peers and learning to interact with and/or take care of/consider, others.

## Using alternative or adapted tool/s

At times of learning or re-learning to use a tool, the person may find it a struggle to find working patterns for how to use it in the desired way. If motivation is low and the outcome experienced is felt to be not worth the effort, then alternative tools are considered. Some examples from everyday life are when someone gives up struggling with chopsticks and instead uses knife and fork; or someone who finds it hard to balance a bicycle uses it with training wheels or shifts to a tricycle instead. In rehabilitation someone with impaired motor control may give up struggling with fine precision of joystick-use and add obstacle avoidance sensors on their powered wheelchair as an alternative.

It may be appropriate to consider introducing additional equipment or to review other tool/s in order to address the person's frustration from prolonged efforts of using equipment which consistently fails them. Ask the person what they would prefer as they will now have reached a stage of understanding about how the tool/s operates, specifically in relation to sequencing of actions to meet environmental circumstances.

It is important to wait until the person has reached the stage of exploring sequencing before considering additional or other tool/s. If new equipment is provided at an earlier stage, they will not be given the opportunity to finalise their exploration of competent tool use and build understanding of how to sequence working patterns for goal-directed tool use.

The person needs opportunities to make trials and errors to explore which actions cause favourable or negative tool-use outcomes. The experiences of unexpected impact and feedback guide the search for working patterns of sequencing the tool-use activity. Through becoming in control of an increasing number of chains and sequences of tool-use patterns, the person can assemble the full tool-use control pattern, enabling goal-directed tool-use performance.

It can be very confusing for the person to suddenly have the facilitator or the tool/s take over handling or operation which will then reduce their opportunity for developing their own strategies for more complex operation and problem-solving.

Additional equipment or new tool/s can assist the person who becomes too frustrated at their consistent low level of success when trying to operate within more complex situations/environments or who needs an electronic mechanism to assist with the preservation of their energy levels.

## Using a joystick or a joystick-mouse

Many assistive technology devices can be used with either a joystick or a joystick-mouse as operating tool, i.e., devices for powered mobility or computerized technology for communication, gaming, etc. Consideration needs to be given to the benefits of using a joystick or joystick-mouse before deciding to trial any other access methods. The initial learning curve for a joystick or joystick-mouse may be longer, but the long-term benefit of this type of access method is its applicability to numerous technologies and the minor physical and cognitive efforts afforded to use it.

### Why a joystick is a magic tool!

- Able to explore with a limited range of physical ability
- One tool used from simple to complex operations
- If joystick is used from the start, change to another operating tool is avoided
- Physical operation of the tool gives sensory feed-back and can be visually observed
- Tool-use understanding can be achieved by physical exploration, due to the joystick's intuitive function; verbal instruction can encourage exploration and explain effects of tool use.

Using a joystick with a motorised device set at low speed, or a joystick-mouse for computerized technology set at low velocity of cursor movement, may give a false impression of proficiency. The low setting allows the person to work in *one-range* of graded adjustment of movements i.e., in the outer physical boundary felt when operating the joystick or joystick-mouse. The true proficiency can be checked by increasing the speed/velocity setting, if the person masters control at the faster speed, then grading of operating movements are fine-graded and *multi-ranged*.

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