

The Four-Quadrant Model of Facilitated Learning

4QMM

Guidelines for Implementation

Purpose of These Guidelines

These guidelines for the implementation of the Four-Quadrant Model of Facilitated Learning (Greber, Ziviani & Rodger, 2006a) have been produced for focus group research into the model. They should be read in conjunction with the formal presentation of the model by the author. It is intended that the information contained within will guide participants in the use of the 4QM by providing specific information regarding the learning strategies contained in the model.

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Background

Occupational Therapists frequently utilise teaching-learning to enable clients to acquire skills that will enhance occupational performance and attain occupational goals (Bass-Haugen & Mathiowetz, 1995; McDougall et al., 1999). Whereas other forms of intervention aim to change combinations of the person, environment and/or occupation, the teaching-learning approach aims predominantly at enhancing the skills and abilities of the learner. Despite the frequency with which this approach is used, occupational therapists are not always well acquainted with the general principles of teaching, or some of the specific learning strategies that lead to effective skill acquisition.

An important part of intervention that uses a teaching-learning approach is the process of increasing autonomy on key tasks that are central to a specific occupational goal. When therapists select learning strategies to aid in skill acquisition, they should aim to do so in a way that encourages the client to become an active part of the learning process. The development of autonomous performance results from a carefully planned teaching-learning process that gradually withdraws facilitator scaffolding, and arms the client with strategies to mediate his/her own performance. To this end, the coordination of learning strategies is important in establishing best practice in occupational therapy. A framework that guides therapists in the selection of learning strategies that best meet the needs of the client is therefore likely to be of value in ensuring quality services.

The Four-Quadrant Model of Facilitated Learning (4QM) (Greber, Ziviani and Rodger, 2006a) is a framework whereby teaching-learning approaches to skill acquisition can be understood within contemporary theoretical postulates of occupational therapy, psychology and pedagogy. It operationalises the basic tenets of teaching-learning and centres them in occupational therapy practice. The 4QM provides therapists with a means of both understanding the teaching-learning processes they are employing, and also evaluating the progress made by learners as they become more autonomous in performing the key skills of the target occupation. It represents the range of learning strategies that can be used as therapeutic tools, and helps therapists to frame interventions in line with principles of best practice. The 4QM is an occupation-centred framework for enhancing teaching-learning approaches to intervention by informing the coordination of the learning process. The model has been published in peer-reviewed journals (Greber, Ziviani and Rodger, 2006a; 2006b; 2006c), and is currently the subject of investigations into its clinical utility.

The 4QM considers the various strategies used in teaching-learning, and provides a structure for implementing a teaching-learning encounter in accordance with learner needs. The 4QM provides therapists using teaching-learning approaches with a framework to shape the skill acquisition process to individual learner needs. For therapists employing such approaches, the 4QM

offers a means of understanding the learning process as it occurs in occupation-centred encounters.

The basic structure of the 4QM represents the integration of two concepts that describe the function of various teaching-learning strategies (see Figure 1). Firstly, strategies can be described on a continuum that represents the level of directness of a prompt. Specific instructions would therefore appear at one end of the continuum, while more subtle alerting strategies (e.g. "Uh-oh, there's a problem there.") would lie at the other. A second continuum that represents the source of initiation can also be used to understand the function of a learning strategy. Some strategies are initiated by the therapist with a view to enhancing the client's performance, while others are self-prompting strategies that the client uses to mediate his/her responses. The integration of these two continua forms the basic four-quadrant structure of the model. The axis of the horizontal continuum is labelled "Direct" at one extreme and "Indirect" at the other. The vertical axis is labelled "Facilitator-Initiated" and "Learner-Initiated". The use of these terms acknowledges that individuals other than the therapist (e.g. other professionals, volunteers, family members) may also be involved in skill acquisition, and that various services use a variety of terms to describe service users. The terms used here provide the model with scope for application beyond that offered by a simple "Therapist" and "Client" dichotomy.

Within each quadrant, learning strategies that share common characteristics and facilitate similar learning processes are grouped. Those strategies that help to specify the parameters of task performance are both direct and facilitator-initiated, and are listed in Quadrant 1. Indirect, facilitator-initiated strategies that engage the client in decision-making are listed in Quadrant 2. Quadrant 3 (direct, learner-initiated strategies) incorporates a range of strategies that provide the means for a client to self-prompt. Factors underpinning autonomous performance are listed in Quadrant 4. These are indirect, learner-initiated strategies.

In addition to the strategies detailed in each quadrant, a range of intermediate strategies are also detailed. These share the characteristics of adjoining quadrants and serve specific functions as learning proceeds. The nature of these strategies is specifically outlined within this guide.

The 4QM is a clinically useful scaffold that therapists can use to plan and coordinate the teaching-learning strategies they employ when the acquisition of key skills is central to enhancing a client's occupational performance. This guide outlines the structure and content of the model, defines the learning strategies contained within, and provides two practical examples of the types of strategies that might be used to facilitate the learning of functional tasks in occupation-centred interventions.

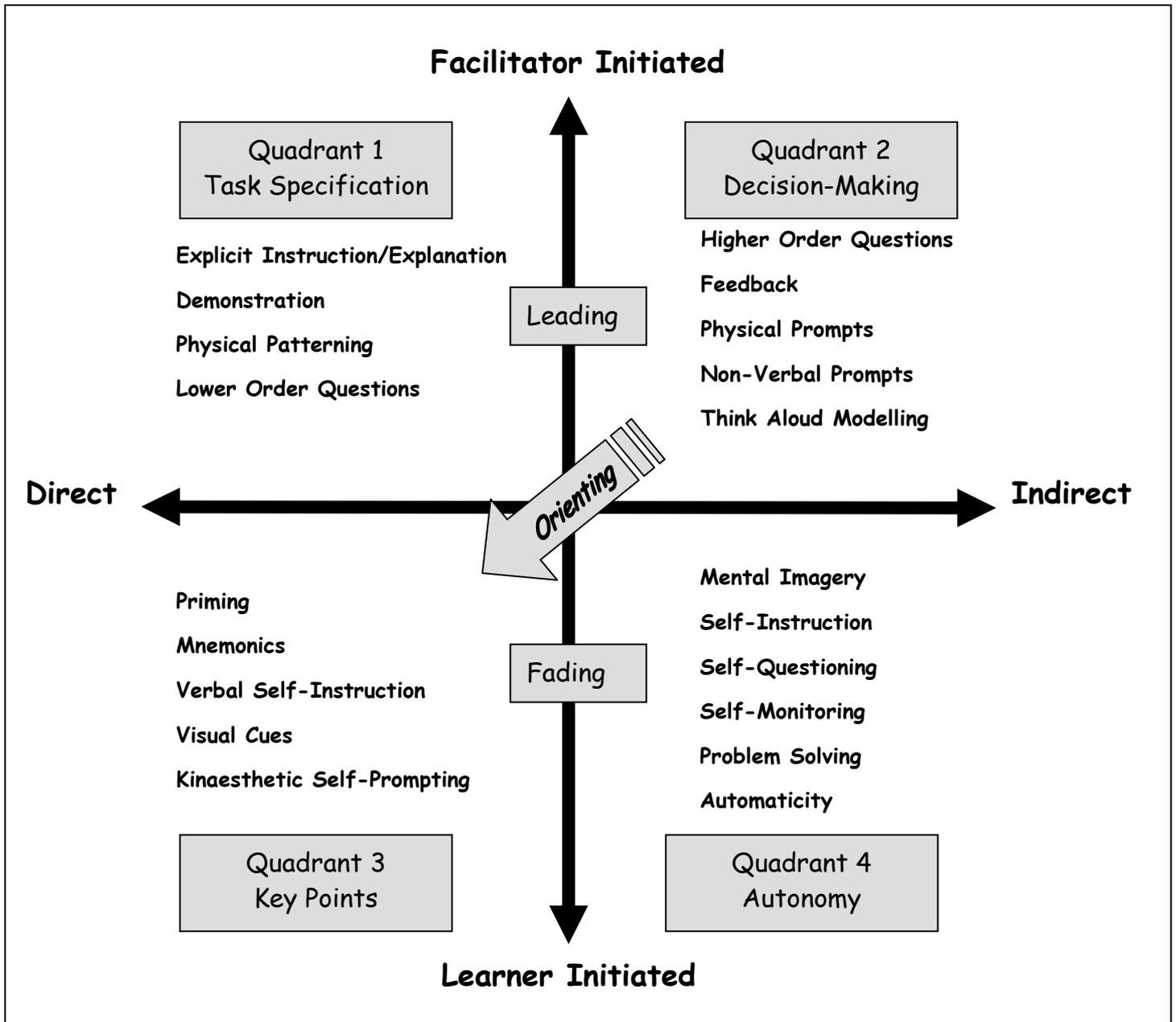


Figure 1 - The Four-Quadrant Model of Facilitated Learning
(Greber, Ziviani & Rodger, 2006a)

Quadrant 1 - Direct, Facilitator-Initiated Strategies

Quadrant 1 strategies use direct methods to communicate information from the facilitator to the learner. That is, the learner is presented with specific information by the facilitator using various forms of instruction. Learning strategies used to inform the learner of the goal of the task, the task requirements, and/or the characteristics of the desired response all share this characteristic. The following instructional strategies meet this description:

Explicit Instruction and Explanation

Explicit instruction and explanation provide the learner with descriptions of various characteristics of the task itself, and/or the expected response. Such strategies can be used to inform the learner of the requirements of the task ("Do this") or key aspects of performance ("Do it this way"). Verbal, print and technology-based forms of instruction may all be classed as explicit instruction and explanation, provided that their purpose is specifically to impart information.

Defining Criteria:

- Used to provide information regarding the task requirements and/or the expected response/performance.
- Provision of information is dependent on the presence of the facilitator.
- Information is presented in verbal and/or print modalities

Examples

- "You need to hold the food still with your fork while you cut to stop it sliding around."
- "Put your arm through the sleeve."
- "Put your left hand here and your right hand here."
- Statements that instruct the learner how to think (e.g. "You need to think about where the front of the shirt is.") still specify how the task should be completed and do not engage the learner in higher cognitive processes to solve the problems. As a result, they are information giving, and thus meet the criteria for explicit instruction and explanation.
- A statement such as "Do it like this" does not provide information on its own, but may be used to focus attention on aspects of a demonstration. In this case the strategy can be classified as explicit instruction and explanation because it combines with demonstration to communicate information to the learner.
- On occasions when the learner asks a question of the facilitator, the response to that question can involve explicit instruction and explanation if it is directed at imparting knowledge about the task and/or response.

Exclusion

- Statements that provide irrelevant information (such as "This recipe seems a bit hard") do not contribute to the learning process and can be regarded as not contributing to the learning process directly, although they often function to maintain rapport or sustain interest in the task.
- When the facilitator responds to a question from the learner, but does so in a way that engages the learner in problem solving rather than providing an answer (e.g. "Maybe you could think about the answer to that"), the response is not characteristic of explicit instruction and explanation. (See also *Higher Order Questions, p.9*)

Demonstration

Demonstration occurs when the facilitator provides an example of the expected response or performance. It can be used to highlight specific technical points, clarify ambiguity in verbal instructions, and/or provide a reference of correctness for the learner's own efforts. Demonstration usually uses visual modalities, but can also be used to model appropriate verbal responses (e.g., in social interaction).

Defining Criteria:

- Provides an example of how the intended performance should appear.
- Presented to the learner by the facilitator.

Examples

- The facilitator shows the learner how to perform the task.
- The learner views a videotape of the task being performed.
- A simulated task is shown using audiovisual technology (e.g. cartoon or social story) as an example of the expected response.
- The facilitator models an appropriate way to answer a question.
- The facilitator shows the learner a sequence of still photographs that show how the task is performed. In this case, the facilitator is essential to the process, and the intention of the strategy is show the learner how the performance should appear.

Exclusion

- If the learner views a series of photographs of each step in a task without prompting by the facilitator, the facilitator is not integral to the process, and the photographs are used as a reminder of the key points of performance. This constitutes a visual cue used in Quadrant 3. (See also *Visual Cues, p.16*)

Physical Patterning

Physical facilitation of the learner's body to perform the desired task while the learner remains passive is considered physical patterning. For instruction to meet this criterion, the learner must not contribute to the movement. Physical patterning might be used to establish the general form or the spatial characteristics of the movement. The facilitator manipulates the

learner's limbs to provide an example of the appropriate performance of the task. Occasions where the learner generates muscular force and is guided by the therapist to meet the movement objectives are not considered physical patterning.

Defining Criteria:

- Involves physical manipulation of the learner's body by the facilitator.
- Provides the learner with a general feel of the desired response.
- Involves the learner remaining passive throughout the process.

Examples

- The facilitator works hand over hand with the learner to perform a task, while the learner remains passive.
- The facilitator moves the learner's limb through the range of motion required to perform the task to provide a general feel for the movement required.
- The task is too difficult for the learner, and the facilitator performs the task for him/her by manipulating body parts to complete the task.

Exclusion

- The learner tries to perform the task but lacks control, and the facilitator directs the limb as required to ensure success. This does not meet the criteria for physical patterning, as the learner is actively moving the body part. It would be considered physical guidance. (See also *Leading Strategies, p. 22*)

Lower Order Questions

Lower order questions aim at the recall and recognition of factual, task relevant material. They engage the learner in recall of facts and test understanding of information. This type of questioning ensures that the learner's interpretation of the task is accurate. Lower order questions can also be used to focus the learner's attention on key aspects of performance by challenging him/her to recall previously learned material.

Defining Criteria:

- Focuses on what the learner already knows.
- Engages the learner only in recall and understanding of previously learned material.
- Used to ensure that the learner knows and understands the characteristics of the task and/or performance.

Examples

- "What do you do next?"
- "Where should you look?"
- "How should you be standing?"
- Some questions are directed at ascertaining the level of understanding the learner has. Questions such as "Why do we stand like this?" can still

be lower order questions if they aim at establishing an understanding of the task, and if they utilise knowledge that has been presented previously. The definitive feature in this case is that the aim is to recall a previously learnt fact, rather than seeking a novel answer.

Exclusion

- Questions that facilitate the use of higher order cognitive skills, such as "Why did that happen?", stimulate the production of new cognitions rather than the recall of old ones. They generate new knowledge, and should be considered to be higher order questions. (See also *Higher Order Questions, p.9*)

Quadrant 2 - Indirect, Facilitator-Initiated Strategies

Facilitator-dependent learning can utilise strategies that encourage the learner to engage in decision-making processes. These strategies require the facilitator to use different forms of facilitation to those involved in the exchange of information (Quadrant 1). They are less direct in that they support the learner to develop solutions, rather than instructing him/her how to perform the task. Quadrant 2 strategies engage the learner by alerting him/her to the decision making processes necessary for autonomous performance. Learning strategies that facilitate this process include the following:

Higher Order Questions

Higher order questions are used to provoke thought and draw the learner's attention to something that needs to be considered. They engage the learner in analysis, problem solving, judgement, reasoning and/ or evaluation. This type of question requires the application of previously learned knowledge.

Defining Criteria:

- Encourage the learner to engage in higher order decision-making processes.
- Stimulate the learner to generate information on his/her own.

Examples

- "What might be the problem here?"
- "How could you do it differently?"
- "Why did that happen?"
- "How does that look?"
- Statements such as "I wonder why that happened", though not phrased as a question, imply a question that requires an answer by the learner. They function to engage the learner in analysis, problem solving and critical evaluation. They do not meet the criteria for think-aloud modelling because the learner, rather than the facilitator, is expected to generate the response. For this reason, statements such as the example above can be considered as higher order questions. (See also *Think Aloud Modelling, p.12*)

Exclusion

- Questions such as "Where do you need to look?" encourage the learner to recall previously learned material. These are lower order questions. (See also *Lower Order Questions, p.7*)
- Rhetorical questions asked by the facilitator of him/herself and answered by him/herself can be used during think-aloud modelling (e.g. "How should I hold this? Maybe if I..."). Their purpose is to demonstrate the thinking process rather than to demand it of the learner. (See also *Think Aloud Modelling, p.12*)

Feedback

While feedback can be intrinsic based on sensory perception and cognitive evaluation of the performance, learning is also well supported by providing augmented feedback (i.e. feedback from others). Feedback of this type can take the form of verbal, gestural (non-verbal) or symbolic information (e.g. ticks or crosses, drawings) provided by the facilitator as critique of the learner's performance. Each of these instructional strategies serves the purpose of supporting learners by engaging them in their own performance and orientating them to the use of self-regulatory procedures.

Defining Criteria:

- Facilitator provides a critique of the learner's performance.
- Information provided aims to engage the learner in reflection about his/her performance.
- Information provided aims to challenge the learner to either reproduce a successful effort or refine his/her performance on subsequent trials.

Examples

- "You really moved smoothly that time."
- "Uh Oh, I think there's a problem."
- "You're leaning a bit to the left."
- Thumbs up or down indicating the quality of the performance.
- Symbolic representations that record or evaluate performance, such as checklists, can provide useful feedback to learners in a visual form. When these strategies are used by the facilitator to gather data on performance and then shared with the learner, they are classed as feedback.

Exclusion

- Statements that instruct the learner how to change the response (e.g., "You need to hold it like this") should be considered as "explicit instruction and explanation" rather than feedback. Such statements specify the response required rather than engaging the learner in their own problem solving, even though they are offered to the learner as critique of his/her effort. (See also ***Explicit Instruction and Explanation, p.5***)
- Questions that engage the learner in critique of their own performance might be used as a means of involving him/her in generating intrinsic, rather than augmented feedback, but are classified as higher order questions rather than feedback. An example of such would be "What do you need to do differently?". (See also ***Higher Order Questions, p.9***)

Physical Prompts

Facilitation that guides the initiation of movement, or provides direction at various points during the response is termed *physical prompting*. Such strategies support the learner to make successful efforts, but do so in a manner that engages him/her in the decision-making process. Physical prompts can vary

from tapping or pushing a limb if the learner does not initiate any movement, to the use of key points of control that lead and direct the learner's active movements.

Defining Criteria:

- Physical contact is made between the facilitator and the learner.
- Learner is responsible for planning and generating the response.
- Prompting is offered only after the learner is given an opportunity to respond independently of the facilitator.

Examples

- Touching a body part as a prompt to use it
- Providing initiation for a movement, but not guiding the body once it is in motion
- In complex activities, it may be necessary to provide physical prompts on various subtasks, rather than just at the commencement of movement. For example, prompts may be used sequentially to initiate grasping the spoon, loading it, accessing the mouth and then replacing the spoon in the bowl.

Exclusion

- The learner moves the limb, but the therapist guides its direction and force. This provides more than just a prompt, and should be considered physical guidance. (See also *Leading Strategies, p.22*)

Non-Verbal Prompts

Learner performance can be initiated, modified and terminated by an array of gestural, symbolic and sensory inputs by the facilitator. For the most part, these take the form of facial expressions, eye gaze, hand and finger movements.

Defining Criteria:

- Facilitator input is limited to non-verbal modalities.
- Intention of the prompt is to encourage the learner to consider/review his/her performance.

Examples

- Facilitator gives a quizzical look to indicate a need to reassess performance.
- Facilitator points at a potential hazard.
- Facilitator directs eye gaze at key objects involved in task.
- If the facilitator adopts the body position required to perform the task, but does not provide an actual demonstration of the task, this can be seen as a non-verbal prompt designed to orientate the learner without providing information on how the task should be performed.

Exclusion

- The facilitator touches a limb to remind the learner to use it. Although non-verbal in nature, it should be considered a physical prompt. (See also *Physical Prompts, p. 10*)
- If the facilitator provides a demonstration of some parts of the task, this should be considered a partial demonstration rather than a non-verbal prompt. (See also *Leading Strategies, p. 22*)

Think Aloud Modelling

While modelling of physical skills can be provided through demonstration, guidance on the use of cognitive strategies can be illustrated through the use of think-aloud modelling. In this strategy, the facilitator audibly describes the decision-making processes that are occurring as he/she performs the task. While demonstration of physical skills has been shown to provide the learner with task specific information, think-aloud modelling shows the learner how to engage in productive processes. Comments can range from the recognition of errors (e.g., "Uh-oh, something's gone wrong"), to more verbose dialogue describing the problem solving process, depending on the cognitive process being targeted.

Defining Criteria:

- Facilitator describes the higher order cognitive processes involved in performance.
- Verbalisation occurs concurrently with task performance.
- Emphasis is on cognitive processes rather than characteristics of the performance itself.

Examples

- "That doesn't seem right. What went wrong there? Maybe if I concentrate on keeping my hand a bit steadier."
- "What happens if I put it on there. Oh dear, it fell off. Where else could I put it? Maybe over here."
- Performance of the task while describing the associated cognitions aloud combines the use of two strategies: demonstration and think aloud modelling. The visual representation of the response is considered demonstration, while the verbalisation is think aloud modelling. (See also *Demonstration, p. 6*)
- If the facilitator says, "When I do it, I think to myself 'better watch the edge of the cup carefully'", he/she is modelling how to engage in the cognitive processes that enable performance. Although framed as a statement, the focus is on productive processes.

Exclusion

- Comments during task performance like "I put my feet like this and move my arms forward like that," or "Watch how I grasp the handle with my hand like this," concurrently use the strategies of demonstration and explicit instruction. They focus on components of the task rather than

the cognitive processes occurring during performance. Such comments do not constitute a think aloud modelling strategy. (See also *Explicit Instruction and Explanation, p.5* and *Demonstration, p.6*)

Quadrant 3 - Direct, Learner-Initiated Strategies

Attaining autonomous levels of performance requires the learner to reduce his/her reliance on the facilitator, so that he/she can establish and monitor the features of task performance and engage in decision-making without the presence of the facilitator. Quadrant 3 represents those strategies that guide performance without direction from the facilitator. These strategies involve self-prompting, where the learner focuses him/herself on key aspects of performance. They are overt behaviours, such as talking out loud, looking at prompt cards or engaging in motor behaviours that are evident to observers, and are thus described as "direct" in nature. The following strategies are representative of those characteristics:

Priming

Priming is distinguished from those strategies that involve repeating procedures that were already learnt, which can be termed practice. Priming strategies bring together the various performance components prior to performance. Such strategies rehearse previously learned procedures to ensure that the intended response is the correct one, such as in a practice golf swing. The goal of priming, then, is to prepare for performance rather than improve it. Each performance is unique, so priming strategies use various modalities to organise a general response schema in order to meet the unique situational demands of the imminent performance.

Defining Criteria:

- Takes place prior to performance.
- A rehearsal of previously learned procedures.
- Aims to prepare for performance rather than improve it.

Examples

- Rehearsing a verbal response prior to giving it. (e.g. Saying your order aloud to yourself while waiting in line for takeaway food.)
- Doing a "dry run" before performing the task
- If a task is unfamiliar or poorly practised, there may be some learning, and consequently some improvement that takes place as the result of priming prior to performance. For example, if the learner is using a piece of adaptive equipment (such as a shoe horn) for only the second time, a trial immediately prior to performance may have the additional benefit of continuing the refinement of the skill, as would result from any practice regime. The key element here is the *intention* of priming. If the goal is to prepare and optimise the response, rather than to provide an avenue for repeated practice and hence skill learning, the strategy can be considered to be a priming one.

Exclusion

- When rehearsal routines are developed with the specific intention of improving performance, there is no specific instructional strategy in place.

Practice is an opportunity to implement previously acquired strategies and refine skills, and does not constitute priming. For example, repeating a task ten times in order to refine the coordination pattern would not be considered priming. Such routines are practice.

Mnemonics

Mnemonics are a form of associative learning that enables learners to increase their capacity to store and retrieve information. Mnemonics act to aid recall of key features, processes, facts and procedural steps. They include the use of link words, acronyms, nonsense phrases and rhymes. Although a facilitator might aid in the development of a mnemonic, its use becomes the responsibility of the learner, making it a learner-initiated strategy.

Defining Criteria:

- Used to aid the recall of key features of performance.
- Employs simplified or symbolic language.
- Learner-initiated use of the strategy.

Examples

- The nonsense phrase "Every Good Boy Deserves Fruit" to prompt the recall of the notes E, G, B, D, and F in musical notation.
- Goal-Plan-Do-Check as a prompt for the stages in performance of the task.
- The learner says, "Nose over toes and up she goes" to focus on body position during transition to standing.
- When the complexity of language used increases, use of a mnemonic can begin to resemble verbal self-instruction. By definition, mnemonics use language that is simple and/or symbolic. When stages of performance are summarised by single words and prompt organisation or visualisation of the task (e.g. using "4 p's" to remember the pinch, press, push and pull stages of buttoning a garment), such strategies would be at the limit of this description. (See also *Verbal Self Instruction, p. 15*)

Exclusion

- When the facilitator, rather than the learner, uses the mnemonic, he/she is effectively instructing the learner in how to perform components of the task, or in how to self-prompt. This strategy does not meet the criteria for mnemonic use as a Quadrant 3 strategy. (See also *Explicit Instruction and Explanation, p. 5* and *Orienting Strategies, p. 22*)
- Verbose dialogue that uses sophisticated language to describe the necessary processes involved in performance (e.g. "I put my socks on, then I put my shoes on, then I pull the tongue into the right place, then I tie up my laces") is best considered *Verbal Self-Instruction, p. 15*.

Verbal Self-Instruction

A learner might use this strategy to engage in the problem solving process, or to recall the steps involved in performance. Such tools support both

cognitive (e.g., memory) and metacognitive (e.g., self-monitoring) processes. The term **Verbal Self-Instruction** can be considered to mean "thinking out loud", and can provide observers with evidence of engagement in cognitive and metacognitive processes.

Defining Criteria:

- Verbalisation is audible to an observer.
- Dialogue is directly relevant to the task at hand.
- Dialogue uses standard syntax and grammar.

Examples

- "I hold it like this and tip it in like that".
- "What happens if I put it on there. Oh dear, it fell off. Where else could I put it?"
- "Put my feet on here. Put my hands on here. Ready to push. Go."
- Asking questions of others can still be a feature of verbal self-instruction if the learner then answers the question him/herself. (e.g. "What do I do next? Oh yes, I put the lace through the hole here.")
- In performing a task, there may be various combinations of task-relevant and task-irrelevant talk from the learner. Those verbalisations that enable performance are forms of verbal self-instruction, while those that do not are not considered under this term, although they serve an important function in maintaining on-task behaviour or building rapport with the learner. A mixture of verbalisations may be apparent in the dialogue.

Exclusion

- Idle talk that is not task-related (such as "We went to the movies on Sunday") does not meet the criteria for verbal self-instruction.

Visual Cues

Visual strategies used by the learner to recall steps or to prompt action serve to orient him/her to key features of performance. Visual strategies including picture cues, computer generated visual prompts, real-object cues, mind maps, graphic organisers, visual displays and computer-assisted instruction are all considered under this heading. Mirrors and video recordings are also useful visual prompts to enhance performance.

Defining Criteria:

- Uses visual modality to prompt performance.
- Utilised by the learner without requiring the facilitator to orient the learner to the prompt.

Examples

- Picture charts that remind the learner to engage in particular behaviours.
- Symbolic pictures or symbols that prompt behaviours, such as a star in the upper left hand corner of a page to prompt the left to right direction of writing.

- A sequence of pictures that guide the learner through the steps of the task.
- A frame around an object to help centre the learner's attention on it.
- If the learner initiates the use of audiovisual material (e.g. puts on an instructional video) to prompt performance, this can provide visual cues that enable learning. If the learner asks the facilitator to put on the video, the learner initiates the strategy, and therefore it still constitutes Quadrant 3 visual cueing.

Exclusion

- If the facilitator puts on a video to teach the learner how to perform the task, this is not a self-prompting strategy. In this case, facilitator-initiated explicit instruction and explanation, together with demonstration, is provided through the use of technology. (See also *Explicit Instruction and Explanation, p.5* and *Demonstration, p.6*)

Kinaesthetic Self-Prompting

Kinaesthetic self-prompting strategies serve to enhance or direct the learner's attention during learning. They include all those actions that the learner takes to remind him/herself about key aspects of performance by using physical movement.

Defining Criteria:

- Initiated by the learner without prompting by the facilitator.
- Involves the movement of body parts.
- Intended to prompt particular aspects of performance.

Examples

- The learner touches his/her legs as a reminder to use them.
- The learner touches a picture cue in order to orient gaze to it.
- If the learner flexes and extends the fingers prior to reaching and grasping an object, he/she may be using kinaesthetic self-prompting to organise their performance. Alternatively, the learner might be using a priming strategy to fine tune the response characteristics required. In this instance, an observer trying to identify the strategy being used needs to understand the learner's reason for engaging in the behaviour. Where the objective is to serve as a reminder for action, it is a kinaesthetic prompt. When the goal is to organise the response, it is considered priming. (See also *Priming, p.14.*)

Exclusion

- When touch or movement is used as a form of self-stimulation, it does not serve the purpose of facilitating performance. This form of touch is not a kinaesthetic prompting strategy.

Quadrant 4 - Indirect, Learner-Initiated Strategies

Internalised strategies for monitoring and evaluating performance are not observable to onlookers, but are necessary for autonomous performance. The lack of evidence to observers of engagement in these processes defines them as "indirect" in nature. Such strategies and processes are assessable only by learner self-reports, which require a level of insight that may be beyond some learners. Performance in Quadrant 4 indicates a level of autonomy on the target task. Successful performance in this quadrant is underpinned by the use of the following covert learner-driven strategies:

Mental Imagery

As a learning strategy, various forms of mental imagery can support decision-making, planning and other cognitive strategies. Although mental imagery may exhibit subtle signs of engagement (e.g., closing of eyes, failure to respond to stimuli), it is a process that occurs entirely within the learner's mind, making it unobservable to onlookers.

Defining Criteria:

- Occurs in the learner's mind
- Unprompted by the facilitator
- Characterised by the construction of a mental picture of the task.

Examples

- Mental rehearsal prior to performing.
- Considering what performance should look like to an outsider.
- Visualising the picture prompts used at a previous stage of learning.
- In some cases, visualising the results of the completed task can be as important as imagining the performance required to achieve it. Such cases use mental imagery as a learning strategy.

Exclusion

- Visualising behaviours and situations that are not task related (e.g. daydreaming) do not meet the final defining criteria of mental imagery.

Self-Instruction

The use of inner speech to direct the learner's actions indicates the internalisation of verbal self-instruction strategies. While verbal self-instruction is an observable learning strategy, self-instruction is a silent, internal process. Self-instruction helps to identify and direct the use of problem solving strategies. It is particularly useful in recalling procedural steps involved in a performance.

Defining Criteria:

- Occurs in the learner's mind.
- Unprompted by the facilitator.

- The learner uses inner language to direct performance in a predetermined fashion.

Examples

- The learner ties his/her shoelaces in a routine fashion using internal dialogue to recall the various steps.
- The learner uses inner speech to recall safety procedures in a cooking task.
- In some circumstances, affirmations of personal competence might be used to establish a positive approach to the task. Depending on the content of the dialogue, such affirmations may enable performance, meeting the criteria for self-instruction.

Exclusion

- When the use of inner speech is directed at changing the characteristics of performance in response to error, rather than recalling established procedures, the content of cognitions is more likely to be characteristic of self-questioning or problem solving. (See also *Problem Solving, p.20* and *Self-Questioning, p.20*)

Self-Questioning

As with self-instruction, inner speech can be used to engage in silent reviews of performance, development and critique of plans of action, and clarification of goals. Self-questioning utilises internal dialogue to analyse information and regulate the use of cognitive strategies through reflective thinking. The distinction between self-instruction and self-questioning is largely an academic one, since neither process is obvious to the observer. If the learner has sufficient insight to distinguish the strategies used, his/her report can be used to support and understand the learning process.

Defining Criteria:

- Occurs in the learner's mind.
- Unprompted by the facilitator.
- The learner uses questions directed at him/herself to promote problem solving behaviours.

Examples

- The learner uses internal language to ask him/herself "What went wrong?" or "How did that go?"
- The learner uses internal language to consider "What are the barriers to performance?"
- A self-directed question like "What should I do differently?" leads to problem solving processes directed at finding the answer. In this case (and indeed all cases of self-questioning) the question itself should be considered to be a different strategy to the cognitive processes involved in answering it.

Exclusion

- The generation of answers to self-directed questions is not part of the self-questioning process, but rather involves the use of problem solving strategies. (See also *Problem Solving, p. 20*)

Self-Monitoring

Engagement in self-monitoring processes supports the appropriate use of specific strategies, analyses their effectiveness, critiques performance and assesses the need for modification. Self-monitoring enables the learner to assess the extent to which their performance matches the anticipated response. Once again, this is an internal process that is not observable to the facilitator.

Defining Criteria:

- Occurs in the learner's mind.
- Unprompted by the facilitator.
- The learner observes his/her own performance and notes any errors.

Examples

- The learner watches the formation of letters with a pencil and identifies inaccuracies.
- The learner compares the finished product with the intended outcome.
- The learner compares his/her own performance with that of a model or demonstration.
- When attempting to maintain balance, the learner may use ongoing changes in body position to maintain a stable base. Where the response is a reflex one that does not involve higher cognitive processing, the collective processes of identifying the need for action, and the action itself can together be considered self-monitoring. For example, maintaining a sitting position requires self-monitoring, but in most cases the small postural adjustments required do not require problem solving. It is therefore impossible to separate the monitoring process from the response in this instance.

Exclusion

- The decision-making process involved in deciding on a course of action in response to error involves processes such as problem solving that are in addition to the recognition of errors. While the identification of errors is part of the self-monitoring process, deciding on a response is not. (See also *Problem Solving, p. 20*)

Problem solving

Various cognitive processes are employed for solving problems including planning, judgement and reasoning. Individually, each of these processes can be used in either observable or unobservable ways to overcome difficulties in performance. Collectively, the synthesis of these processes in deciding on a course of action is a covert process termed problem solving.

Defining Criteria:

- Occurs in the learner's mind.
- Unprompted by the facilitator.
- Learner attempts to overcome obstacles to performance without assistance from the facilitator.

Examples

- The learner alters his/her performance in light of self-identified error.
- The learner considers contextual factors (e.g. physical environment) that necessitate a change in the way the task is performed.
- In cases where the learner attempts to alter performance but subsequent attempts remain unsuccessful, the learner has still utilised problem solving strategies. The success or otherwise of those strategies may indicate the learner's ability to generate appropriate solutions, but the employment of problem solving strategies should be noted, regardless of outcome.

Exclusion

- When the learner repeats an unsuccessful performance without attempts to modify it, it is clear that no problem solving strategies have been utilised.

Automaticity

A final autonomous phase of learning where performance is not particularly demanding of attention, and does not require conscious thought or effort, is the stage of automaticity. Responses take on an unconscious nature, and environmental features are spontaneously detected and processed. As a level of automaticity develops, processing occurs without the forms of internalised self-prompting that mediated earlier autonomous stages. Responses become routine, consistent and predictable, and occur in the absence of conscious planning.

Defining Criteria:

- Performance occurs in the absence of conscious effort.
- Other tasks are able to be performed simultaneously

Examples

- The learner is able to accurately form letters and place them on the line when writing, while focusing on the semantic and grammatical structures necessary for effective communication.
- The learner responds to changes in environment by spontaneously generalising the skills to new and novel contexts.
- It is not possible to determine precisely when a skill reaches the automatic stage. A task that breaks down occasionally under novel conditions is probably in the early stages of becoming automatic.

Exclusion

- Performance that is characterised by periods of thought or revision, or is inconsistent, is clearly not yet fully automatised.

Intermediate Strategies

Some instructional strategies do not completely fall within the boundaries of particular quadrants, and can best be conceptualised as straddling two quadrants. They might perform dual functions, or link the content of one quadrant to that of another. Three forms of intermediate strategies are discernable.

Leading Strategies

Some forms of questions, incomplete statements, and physical guidance reflect characteristics of both task specification (Quadrant 1) and facilitation of problem solving processes (Quadrant 2). These strategies might provide effective links between information-giving strategies of Quadrant 1 and decision-making processes of Quadrant 2.

Defining Criteria

- Strategy does not meet the defining criteria of any other classification.
- Strategy exhibits characteristics of both information exchange **and** promotion of higher cognitive processes.

Examples

- Cloze (incomplete statements) such as "Next, you need to..."
- Guiding a client's reach and facilitating the grasp of an object by working hand over hand (physical guidance).
- Questions that stimulate both higher and lower order cognitive processes (e.g. "What part of your body should you use to overcome that problem?")
- Partial demonstration of the expected response.

Exclusion

- Any strategy that meets the defining criteria for another classification.

Orienting Strategies

Strategies that share the characteristics of Quadrant 2 (engaging the learner in problem solving processes) and Quadrant 3 (remembering key features of performance) help orientate learners to the need for self-regulated instruction. Such intermediate strategies are termed "orienting strategies". They include verbal and non-verbal strategies that provide no information to the learner apart from a reminder to use self-prompting procedures.

Defining Criteria

- Strategy does not meet the defining criteria of any other classification.
- Strategy directs the learner to use self-prompting strategies.
- Strategy does not provide information that describes the task or the desired performance characteristics.

Examples

- "What could you say to remind yourself what to do next?"

- The facilitator points to the learner's picture prompt.
- The facilitator says, "Use your strategies".

Exclusion

- Any strategy that meets the defining criteria for another classification.
- Strategies that alert the learner to aspects of performance (e.g. "Where should your hand be?"), rather than reminding them to use self-prompting strategies (e.g. "Where could you look to jog your memory?") do not exhibit the characteristics of orienting strategies.

Fading Strategies

The internalisation of the overt self-regulation strategies of Quadrant 3 is a gradual process. Some forms of self-prompting are indicative of decreasing reliance on direct self-prompting, yet do not represent the internalised (covert) processes of Quadrant 4. While they are evidence of the internalisation of Quadrant 3 strategies, they are not representative of the self-regulation of Quadrant 4. Strategies such as subvocalisation (whispering) are on the margin of both quadrants. Gestural prompts can serve the same purpose of internalising procedural prompts, but through a different modality.

Defining Criteria

- Strategy does not meet the defining criteria of any other classification.
- Strategy represents an internalisation of aspects of self-prompting used in earlier stages of learning.

Examples

- Spontaneous whispering of self-instructive comments by the learner during performance.
- Chunking of multiple steps on a picture prompt chart into single stages (e.g. picture to summarise steps in the dressing process, rather than using multiple pictures to prompt performance of each step).
- Physical movements such as counting on the fingers that indicate engagement in cognitive processes.

Exclusion

- Any strategy that meets the defining criteria for another classification.

Glossary of Terms

Quadrant 1

Explicit Instruction/Explanation - Telling the learner what to do or how to do it

Demonstration - Showing the learner how to do it

Physical Patterning - Facilitator moves the learner's body to perform the task

Lower Order Questions - Questions that prompt recall of learned material
e.g. "What do you do next?"

Quadrant 2

Higher Order Questions - Questions that encourage the learner to problem solve e.g. "Why do you think that happened?"

Feedback - Provision of information about the attempt that helps shape future responses e.g. "Uh Oh, you used the wrong buttonhole"

Physical Prompts - Physical facilitation that prompts the initiation of movement, or helps to correct inefficient movement.

Non-Verbal Prompts - Gestural prompts that provide information about performance. e.g. Pointing to the label on a garment to remind the learner to use it to orientate when dressing

Think Aloud Modelling - Facilitator describes the reasoning process that occurs in his/her own mind as he/she completes the task. e.g. "There's the label, and the label goes at the back, so if I turn the shirt around...that's it..."

Quadrant 3

Priming - Rehearsing the desired response before actually doing the task.

Mnemonics - Rhymes, songs or acronyms as a reminder of the steps required.
e.g. SOAP as a reminder for writing file notes.

Verbal Self-Instruction - Talking out loud as the task is completed.

Visual Cues - Pictures or symbols as reminders.

Kinaesthetic Self-Prompting - Touching a body part as a reminder to use it.

Quadrant 4

Mental Imagery - Learner imagines him/herself doing the task prior to attempting it.

Problem Solving - Overcoming obstacles to performance by independently finding solutions.

Self-Instruction - "Invisible" mental process of talking self through task.

Self-Questioning - "Invisible" mental process of reflecting on performance.

Self-Monitoring - "Invisible" mental process of observing the correctness of performance throughout its duration.

Automaticity - Final stage of skill mastery where performance occurs instinctively without the need for much attention nor thought.

Intermediate Strategies

Leading Strategies - Providing partial information but also encouraging the learner to make decisions about performance.

Orienting Strategies - Reminder to learner to use self-prompting strategies

Fading Strategies - Gradual reduction of overt self-prompts, moving toward internalised self-prompting.

Case Examples

Following are two case examples of strategies that might be useful in teaching specific tasks that might be barriers to occupational performance: toothbrushing and shoelace tying. The examples detailed are intended to clarify the definition of each type of learning strategy by providing illustration of how the strategy might be used on a practical basis. The examples are not linked to each other, nor are they intended to be part of a coordinated intervention program.

Example 1 - Toothbrushing

Quadrant 1 - Task Specification

Explicit Instruction and Explanation - The Facilitator says, "Hold your brush with your thumb on top and the bristles pointing down."

Demonstration - The Facilitator shows the Learner the correct way to grasp the toothbrush.

Physical Patterning - The Facilitator holds the toothbrush by grasping over the top of the Learner's hand. The Learner remains passive while his/her hand is moved to manipulate the brush over the teeth.

Lower Order Questions - The Facilitator says, "Where does your thumb go?" having previously described and/or demonstrated this.

Quadrant 2 - Problem Solving

Higher Order Questions - The Facilitator says, "How could you hold the brush differently to get to the teeth up the top?"

Physical Prompts - The Facilitator taps the learner's elbow to indicate the need for a change of brush position and/or grasp.

Non-Verbal Prompts - The Facilitator points to the left upper group of teeth, and the Learner works out how to orient the brush to clean that part of the mouth.

Feedback - The Facilitator says, "You are missing some spots up the back."

Think-Aloud Modelling - "The Facilitator says, "When I brush my teeth, I always ask myself 'Am I getting all those teeth up the back?'"

Quadrant 3 - Key Points

Priming - Before starting the task, the Learner rehearses the various grasps necessary for brushing the different parts of the mouth.

Mnemonics - The Learner recites the rhyme "Thumb on the spot, helps a lot" to prompt correct grasp of the toothbrush.

Verbal Self-Instruction - The Learner says, "I put my thumb on here, then I turn my hand over," to prompt the correct upper limb position for brushing the top teeth.

Visual Cues - The Learner refers to a picture of the correct grasp to prompt finger and thumb position on the toothbrush.

Kinaesthetic Self-Prompting - The Learner touches the side and part of the face (e.g., right upper, left lower) that should be brushed next before commencing brushing that part.

Quadrant 4 - Autonomy

Mental Imagery - The Learner imagines the surface of the teeth they are going to brush next, and uses that to orient the toothbrush appropriately.

Problem Solving - The Learner identifies a better finger and thumb position on the brush when the existing grasp is not successful in cleaning the tooth surface.

Self-Instruction - The Learner uses inner speech to remind him/herself of the sequence cleaning (e.g., lower left, lower right, upper left, upper right).

Self-Questioning - The Learner judges the success of a particular grasp in cleaning the surface of one section of teeth.

Self-Monitoring - The Learner ensures that all surfaces of the teeth are being brushed successfully and adequately.

Automaticity - The learner brushes teeth while watching television.

Intermediate Strategies

Leading - The Facilitator grasps the toothbrush over top of the Learner's hand, and restricts the brushing motion to ensure the brush does not protrude into the back of the pharynx when the learner brushes.

Orienting - The Facilitator says, "Where could you look for help?" to encourage the Learner to use his/her picture chart.

Fading - The Learner whispers, "I put my thumb on here, then I turn my hand over," to prompt the correct upper limb position for brushing the top teeth.

Example 2 - Shoelace Tying

Quadrant 1 - Task Specification

Explicit Instruction and Explanation - The Facilitator says "Make a loop with one lace and wrap the other lace around it."

Demonstration - The Facilitator shows the Learner how to tie the lace, highlighting individual steps in the lace tying process (e.g., tying the initial granny knot, forming a loop).

Physical Patterning - The Facilitator manipulates the Learner's hands to tie the lace, while the Learner remains passive and does not initiate nor direct the movement.

Lower Order Questions - The Facilitator says, "Does the left lace go over or under the right one?" (the correct answer having already been taught).

Quadrant 2 - Problem Solving

Higher Order Questions - The Facilitator says, "Why does the end of the lace keep slipping right through when you pull on the two loops?"

Physical Prompts - The Facilitator nudges the Learner's hand away from the body to encourage a clockwise rather than anticlockwise circle of the lace around the loop. Once the movement is initiated, the Facilitator withdraws physical contact from the Learner.

Non-Verbal Prompts - The Facilitator points to the right side lace to encourage formation of a loop.

Feedback - The Facilitator says, "That's great, you've really got the size of the loop right now."

Think-Aloud Modelling - The Facilitator says, "If I circle this around the loop...whoops...that's too small. I'll try again. That's better - I needed a bigger loop."

Quadrant 3 - Key Points

Priming - The Learner rehearses the direction of circle around the loop with the left hand before deciding on the correct direction.

Mnemonics - The Learner verbalises the acronym CUP LAT to remind him/herself of the steps Cross, Under, Pull, Loop, Around, and Through"

Verbal Self-Instruction - The Learner says, "Over, under and through. Make a loop, right around, through the window, change hands and pull.

Visual Cues - The Learner refers to a photographic sequence of the steps in shoelace tying as a reminder of the order in which to perform them.

Kinaesthetic Self-Prompting - The Learner pinches the fingers of both hands together as a reminder to use a fine pincer grasp to hold and manipulate the shoelace.

Quadrant 4 - Autonomy

Mental Imagery - The Learner imagines him/herself completing the steps involved in shoelace tying prior to and/or during the task.

Problem Solving - After an attempt is unsuccessful, the Learner makes adjustments to the loop size on subsequent attempts.

Self-Instruction - The Learner uses inner speech to talk through the steps of shoelace tying. The Learner might use complete internal dialogue of the problem solving process, rote scripts of the procedure or mnemonics to recall the various steps.

Self-Questioning - The Learner reflects on an attempt at tying shoelaces, identifies errors or inaccuracies and critiques performance using inner speech to generate and answer task-relevant questions.

Self-Monitoring - The Learner makes small adjustments to the knot on an ongoing basis as the task is being performed.

Automaticity - The Learner ties his/her laces while talking about an unrelated issue.

Intermediate Strategies

Leading - The Facilitator says, "Make a ..." and the Learner says, "loop" to prompt the loop formation step in lace tying.

Orienting - The Facilitator says, "What could you say to remind yourself what to do?"

Fading - The Learner independently orients to a modified picture chart that chunks together elements of the task into two photographs: the granny knot and the bow knot.

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Facilitator Initiated

1 – Task Description

2 – Decision-Making

Direct

Indirect

3 – Key Points

4 - Autonomy

Learner Initiated

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