AO
Education Institute

Faculty Support—eLearning

Module 1
How people learn

What you need to know to succeed in AO's
online course for Faculty.

2-Giving a Lecture

3-Running a practical exercise

4-Facilitating small group discussions

5-Moderating and debating

Contents

For best use…

The "How people learn" module consists of this booklet and an online course.

Booklet:
Designed to provide a practical guide to the learning theories and principles that help us understand how adults learn best.

Online component:
• Knowledge check
• Summary

In this module (and throughout the AO Faculty Learning Program) you will explore how to apply the key principles of learning. This will ensure best practice how learning programs are designed and delivered.

Learning outcomes

After completion of this module, you should be able to:

• Define learning
• Demonstrate the learning cycle
• Describe how knowing about learning domains, styles, and types of adult learners, can improve teaching
• Identify the learning experiences that will produce the highest rates of learner retention
• Outline the 7 principles of teaching for learning in structuring learning programs
• Write meaningful learning outcome statements
• Plan and structure a learning session
• Reflect on how feedback can be used to improve learning

There are five modules, which complement each other. Together they give a thorough and up-to-date overview of the most relevant aspects of teaching others.

Module 1: How people learn

Module 2: Giving a lecture

Module 3: Running a practical exercise

Module 4: Facilitating small
group discussions

Module 5: Moderating and debating

Crosslinks:

Booklet
refers from online exercise to booklets

Action plan

Knowledge check

Online exercise

Summary

LEADING TO LEARN

Teaching is a combination of leadership and art. Great teachers, like great leaders, are capable of inspiring others into surpassing themselves. But what is the difference between the good and the great? It is said that "the good teacher explains", but "the great teacher inspires". However, there can be no inspiration without a polished delivery. The old adage "it's not just what you say but also how you say it" holds especially true for teaching.

The AO eLearning course provides AO faculty members with the tools and know-how that can make a real difference to their teaching. Consisting of an online self-evaluation component together with booklets (as downloadable PDFs), the information is conveyed in an interactive manner, allowing immediate feedback. With the online exercises, you can assess your current level of knowledge and test the new skills you gained. The booklets complement the online course, providing a concise overview of the key principles of teaching and learning.

AO eLearning should inspire you to motivate learners and peers alike.

Born to learn
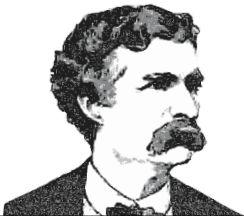
> "If you hold a cat by the tail you learn things you cannot learn any other way."

Mark Twain;
(1835–1910)
American writer and humorist

Remember this...

Learning is a change in practice as the result of an experience.

We have all learned a great deal in our life. From the day we were born, and even before, our brains were ready to capture our experiences and encode them into a web of nerve connections. Childhood behavior specialists believe that we learn 80% of everything we will ever have absorbed by the time we are five years old. Think about this: each child moves from being unable to focus their own eyes to being the only person in the household who can program the VCR in just five short years! Each of us is essentially a learning machine.

What is learning?

So, what is this learning? There's a simple and broad definition we can use: Learning is a change in practice as the result of an experience.

Let's break this definition down…

For learning to have happened there must be a change in practice—the learner should be able *to do different things or do something differently*. Learning, as we define it, cannot be achieved in either of these examples by simply acquiring knowledge as they both require an opportunity to practice. In other words, there is an experience (or more probably a series of experiences) at the heart of the learning process.

Example 1:
A young girl riding a bike will be able to say she has learned how to ride when the stabilizers come off and she can move along, balancing on two wheels without falling over. She will have learned how *to do a different thing*.

Example 2:
A trauma surgeon may have learned how to insert a locking compression plate; mastery of this new technique would save time and vastly improve the results of the procedure. She or he will have learned how *to do something differently*.

Learning with understanding

As with the examples above, knowing things and applying what we know is key to the ability to do things well. Gaining new knowledge is part of the journey, but not the destination.

The learning cycle
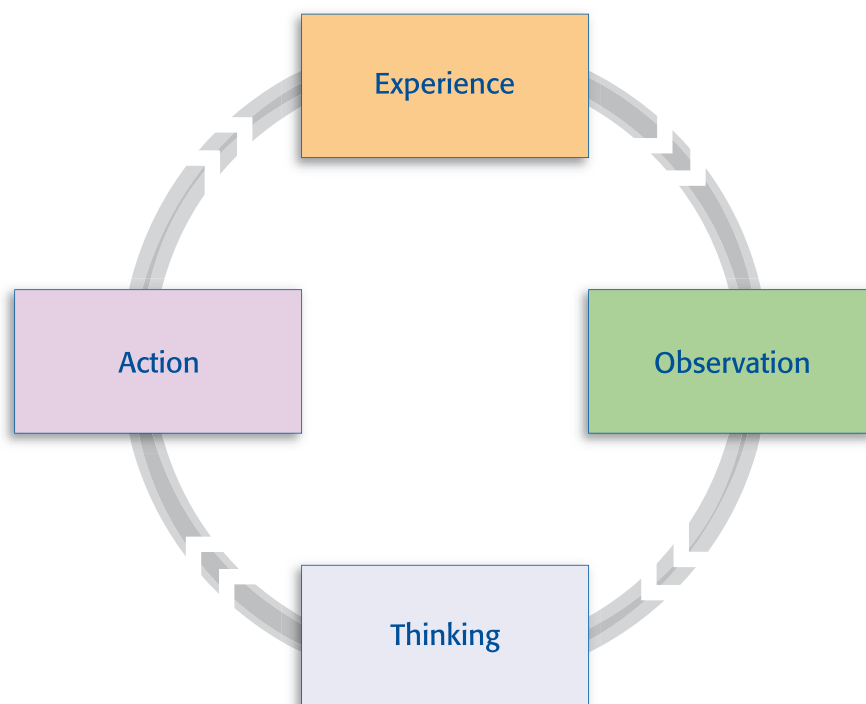
> "I have 25 years' experience often really means: I have one year's experience, and it is 25 years old."

Claus Møller;
Danish business economist and consultant

In 1984, an American academic called David Kolb published a book called "Experiential Learning—Experience as the Source of Learning and Development".

In it, David Kolb describes a four-stage model of "learning by doing" that explains a full range of events leading to learning:

• Experience
• Observation and reflection
• Thinking and theorizing
• Action, planning, and experimenting

Essentially, the cycle is continuous: there is no start or end point.

We can break down the acquisition of a new skill as one journey around the cycle, but in fact we will go around the cycle repeatedly as we seek mastery of a new skill—continuously improving and changing our practice. Working around the learning cycle helps to identify key elements which should go into the design and delivery of learning programs.

Stage 1—Experience
This can be any kind of input or stimulus, for example:
• Something that has gone wrong, such as a surgical procedure or a small boy falling from his bike.
• A more formal input, such as an exercise, a lecture from an expert, or information from a book or website.

Stage 2—Observation
This is when we try to make sense of our experience by reflecting upon it:
• Does this change anything?
• Are there any generalizations of principles which can be drawn here?

Stage 3—Thinking
This is the stage of the journey when we can logically analyze the theory and application of what we have learned.

Stage 4—Action
This is the real action stage and involves the learner putting in practice what they have learned.

Of course, once we have carried out our action, we have another experience where we can observe what happens and the cycle begins all over again.
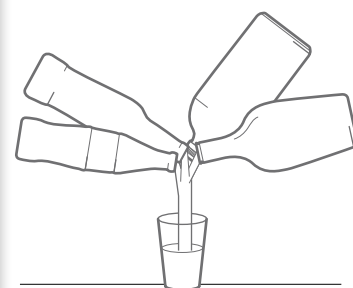
Remember this...

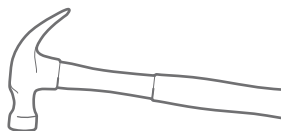Design learning activities or programs to include each element of the learning cycle:

• An input or stimulus.
• Time for reflection.
• Theory—old, new, and practical application.
• Active involvement: trying out a new technique or planning the next step or "experience".

Knowledge check

How we retain information

Lecture
Reading
Audiovisual
Demonstration
Discussion
Practice doing
Teach others

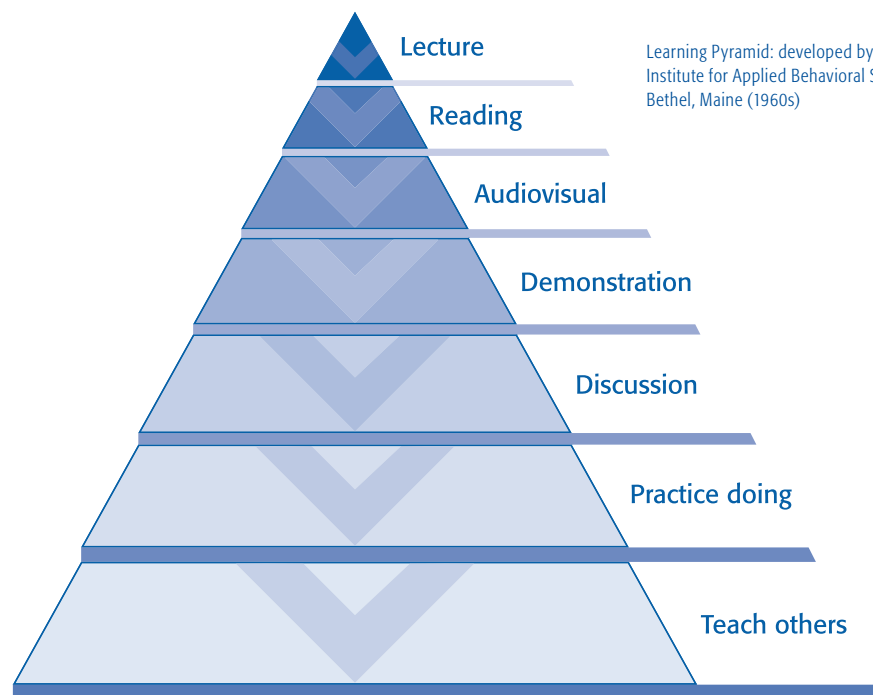Learning Pyramid: developed by NTL Institute for Applied Behavioral Science, Bethel, Maine (1960s)

Remember this...
Provide context, triggers, and active learning:

- People need to know why they are learning something: give a practical focus/relevance to their work and experiences.
- People have a repository of real life experiences that should be tapped into as a resource for ongoing learning.
- People use a hands-on problem-solving approach to learning.
- People want to apply new knowledge and skills immediately. Retention decreases if the learning is applied only at some future point in time.

Based on Malcolm S Knowles "Theories of Adult Learning"

Why do we remember some things long after we have been taught them and forget others almost straight away? As a general rule, the amount of retention will be directly affected by the quality of the original learning process. *Simply stated, if you did not learn the information well initially, you will not remember it well either.*

The Learning Pyramid is often used to illustrate that the more multisensory and active a learning activity is, the greater the retention rate. There is much evidence that active learning—discussions, practicals, teaching others—is more effective than traditional passive methods, such as lecturing, showing videos, or giving demonstrations. (Although there is some discussion about the precise percentage figures used on the Learning Pyramid.)

Different memories
For example, you are more likely to learn and remember the steps you need to take when repairing a dural tear by having "hands-on" practice and by explaining the procedure to someone else, than just by attending a lecture about it. This pattern is also sup-

ported by the latest neuroscientific research about the way the brain functions and how we remember things.

There is no single part of the brain used to store memories—in fact, there are five:
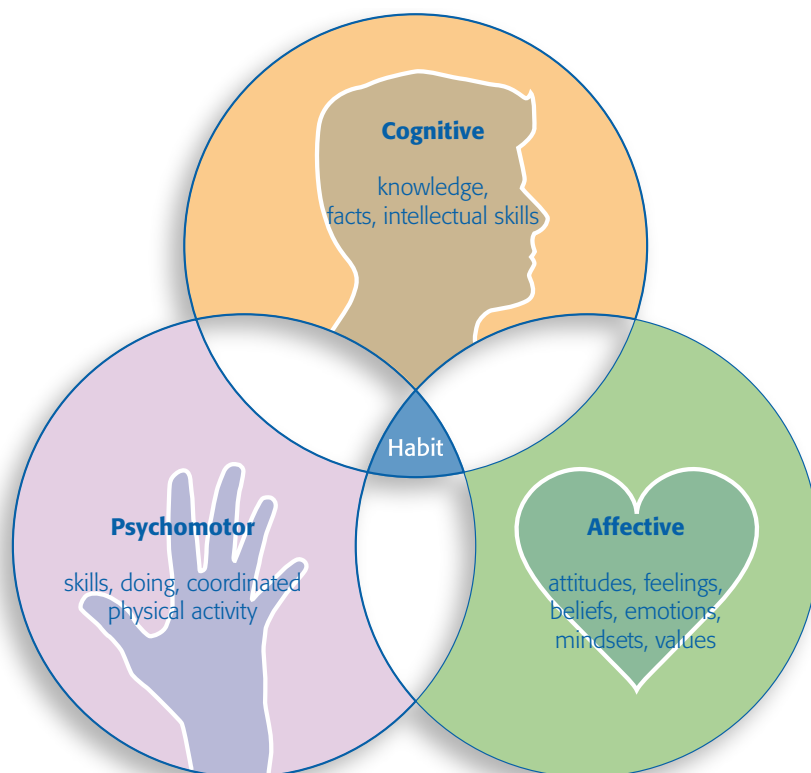- Working memory (very short term)
- Implicit memory (autopilot)
- Remote memory (data)
- Episodic memory (personal experiences)
- Semantic memory (meanings of things, such as words and symbols)

Context counts
Studies have shown that we can retrieve almost everything from our various memories. However, the ease with which we do this depends on the strength and processing of the initial input and/or triggers which place the learning into context.

Now again the importance of multisensory learning becomes clear. When several senses are simultaneously involved and the message is being received through a number of different channels, it stands a better chance of remaining prominent—*make the learning active, make it personal—make it episodic!*

Different learning styles

Cognitive
knowledge, facts, intellectual skills

Psychomotor
skills, doing, coordinated physical activity

Habit

Affective
attitudes, feelings, beliefs, emotions, mindsets, values

"The key to wisdom is this—constant and frequent questioning... for by doubting we are led to question and by questioning we arrive at the truth."

Pierre Abélard;
(1079–1142)
French scholastic philosopher and theologian

The "Taxonomy of Educational Objectives" published in 1956 by the American cognitive psychologist Benjamin Bloom, identifies three domains of learning:

Cognitive (knowing)
Intellectual skills and abilities
Example: diagnosing a disease or developing a strategy.

Psychomotor (skills, doing)
Skills that require varying levels of well-coordinated physical activity
Example: suturing an open wound or performing a complex surgical procedure.

Affective (attitude, feelings)
• Dealing with feelings, emotions, mindsets, and values
• Nurturing desirable personal and professional attitudes
 Example: displaying ethical values and mutual trust in working with healthcare teams.

We can visualize effective learning as using each of these domains—at appropriate times—to achieve *"praxis" (the successful performance or application of skill).*

Learning styles
As well as there being different "domains" of learning, there are also differences between learners.

In terms of learning, this means that every person has their own individual learning style, a preferred way of using their abilities. People will tend to learn more effectively if learning is orientated toward their own dominant "preference".

Appreciating these preferences can serve as a guide when we design learning experiences to match (or mismatch) the learners' styles.

Learning style models
There are three well used learning style models that help explain different learning preferences:

1. Visual, auditory, kinesthetic (VAK):
The basic idea is that everyone has a dominant sense and this creates the preferred channel for receiving and processing material:
• Learning by seeing (visual)
• Learning by listening (auditory)
• Learning by doing (kinesthetic)

Different learning styles

Visual, auditory, kinesthetic (VAK) learning style
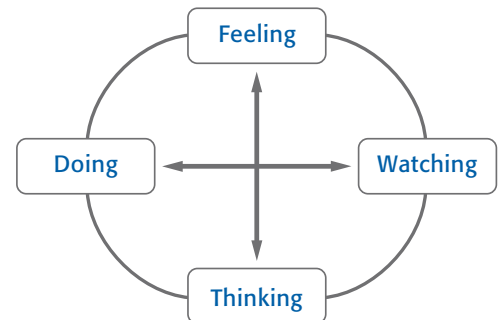
Kolb's learning style
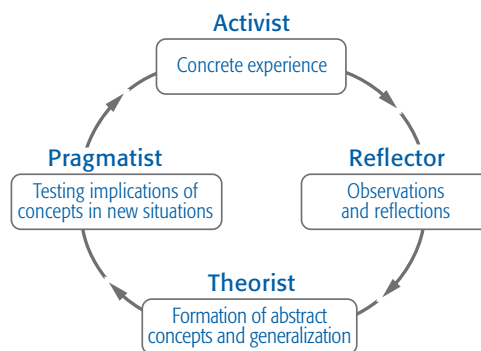
Honey and Mumford learning style

Remember this...

• Accommodate learners' needs and styles.

• Cover all three learning domains, knowledge, skill, and attitude.

• Plan learning experiences to include visual, auditory, and kinesthetic elements.

• Accommodate different learning preferences (watching, feeling, thinking, and doing) throughout an activity or program.

• Adapt activities or teaching styles to the personalities and types of adult learners.

2. Kolb's learning styles

The American educational theorist David A Kolb explained learning styles as a product of two decisions:

• How we approach a task (we learn either by watching or by doing).

• How we respond emotionally (we learn either by thinking or by feeling).

3. Honey and Mumford

British psychologist Peter Honey and Alan Mumford defined four distinct learning styles based on Kolb's theory and experiential learning cycle:

• Reflector—observes and reflects (learns by watching and feeling)

• Theorist—wants to understand underlying reasons and concepts (learns by watching and thinking)

• Pragmatist—likes to "have a go" (learns by doing and thinking)

• Activist—prefers hands-on experiences (learns by doing and feeling)

Types of adult learners

Personality-based learning style can also be useful to ensure effective learning. The American educator and human resources expert Geri E McArdle identifies 5 main types of adult learners:

Confident—wants to know the reasons why and likes to be involved.

Affective—likes to be reassured of doing OK and wants to feel an emotional connection to the trainer. Enjoys to be invited to join.

Transitional—has been promoted or moved to a new job and wants to know how to apply new knowledge. Can be hesitant and needs reassurance of being capable.

Integrated—usually self-directed and wants the freedom to carry out assignments without much guidance.

Risk-taking—thrives on new skills and information. Likes to deviate from the course curriculum if this will give more information.

Knowledge check

How to plan learning activities

"You don't understand anything until you learn it more than one way."

Marvin Minsky;
American cognitive scientist in the field of artificial intelligence

What learning is required? Interestingly, there is often a mismatch between an organization's professional competencies and the training activities it offers. This is because professional competencies are mainly skills-based whereas training is often knowledge-based.

Also, much organizational training is focused on "low-order" skills such as "recalling facts" or "understanding procedures" whereas the workplace requires more "higher-order" skills like "applying knowledge", "assessing situations", or "making decisions".

Think about: Are we using lectures when more group discussions and practical sessions would be more effective?

Bloom's taxonomy

A very useful tool to ensure progression within a learning program is Benjamin Bloom's taxonomy (see table). It shows how learning can be structured to help the learner achieve higher order skills in all three learning domains (cognitive, psychomotor, affective) and applies to skills-based as well as knowledge-based competencies.

Evaluating types of learning activities

Let's consider some other questions when evaluating types of learning experiences:
- Are learners given a chance to *do* and *felt* as well as *know*?
- Do the planned activities cover a whole range of preferred learning styles?
- Is the learning program structured to allow progression?
- Do learners only imitate (copy) new skills or do they progress to a level where they could also demonstrate and teach others?

As we have seen earlier, in order to maximize effective learning, activities need to be *engaging, relevant, and memorable.* They should also incorporate theory, practice, and reflection.

Remember this...

Use a range of different learning activities, including:
- Lectures, quizzes, videos, and expert talks
- Research, observations, and interviews
- Practicals and peer tutoring
- Group discussions and brainstorming sessions
- Role play and problem-solving games
- Case-studies and debates
- Technology-based learning/self-learning and assessment
- Personal action planning and work-transfer tasks

Bloom's Taxonomy			
Cognitive *Knowledge*	**Psychomotor** *Doing/skills*	**Affective** *Attitude*	
Recall data (facts)	Imitate (copy)	Receive (awareness)	1
Understand (comprehend)	Manipulate (with instructions)	Respond (react)	2
Apply (use)	Develop (precision)	Appreciate values	3
Analyze	Articulate (explain/teach)	Personalize value system	4
Synthesize (create/build)	Automatic (expert level)	Internalize (change behavior)	5
Evaluate (assess/judge)	-	-	6

1 = low-order skill
5 = high-order skills

The seven principles

"People rise to the challenge, when it is their challenge."

James A Belasco;
American author, consultant, and professor of management

Remember this...

Maybe this has happened to you as well: You bought a new car and suddenly you see the same model on the roads everywhere.

You ask yourself "Where have they all come from?"—to which there is a simple answer: The cars have always been there, but now as you bought this very same model you have a "reason" to see them.

(RAS, the reticular activating system in our brain decides what we pay attention to, it also determines if we are highly motivated or bored.)

Just as there are principles for managing fractures, there are also principles of teaching. The following seven principles should be incorporated into your programs:
Motivating
Meaningful
Actively involving
Outcome driven
Based on capacity to learn
Incorporating reflection
With feedback

Let's look at these principles in detail:
- Every session should be *motivating*. Motivation is a major factor in learning. If you want to make sure that somebody learns you have to communicate the goal and that the learner is motivated to achieve that goal:
  – Use novelty and variety
  – Pay attention to learners' needs— starting with their basic needs. If people are cold or thirsty their attention will not be on your subject.
  – Give the "big picture"—where a session fits in with what's gone before and what it will lead to.
  – Plan with learners—draw out personal goals and aspirations.

- Every session should be *meaningful*. Can the learners actually "use" the content of the session? The content needs to be relevant to problems they will encounter later, and be interesting too.
- Every session should be *actively involving*. Passive and dependent learners will lose interest. What can you do to make them think? Ask questions, pose problems, or present cases or situations which require individual solutions.
- Every session should be *outcome driven*. What should the learner be able to do or know by the end of the session? By making outcomes your starting point, you can ensure your learning strategy is effective.
- Every session should be based on a *capacity to learn*. Have you pitched the session at the correct level? If the level is too low, learners will be bored. If the level is too high, they will lose concentration.
- Every session should *incorporate reflection*. After each learning session give the participants time to reflect and consider the relevance in their own context.
- Every session should incorporate *feedback*. Feedback is the fuel that drives improved performance.
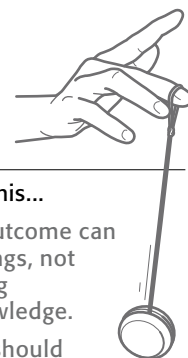
Knowledge check

Learning outcomes

Have you ever been tempted to use a learning activity because it's the one you always use, without fully considering what it needs to achieve in terms of learning?

A learning outcome states what a learner is expected to know, understand, or be able to do at the end of the learning activity. Having good, clear learning outcomes puts the focus on learning rather than teaching. This can:
- help students by explaining what is expected of them and how the activity will contribute to success.
- help staff to focus on exactly what they want students to achieve in terms of both knowledge, skills, and attitudes.

Ask yourself: Have you ever been tempted to use a learning activity because it's the one you always use, without fully considering what it needs to achieve in terms of learning?

How to express learning outcomes
Learning outcomes refer to observable and measurable knowledge, skills, and attitudes.
Learning outcomes should be written from the point of view of the learner and should start by using a phrase such as:

"Upon successful completion of this session, you (the participant/learner) will be able to…"

Each individual learning outcome can then be listed. It will normally be broken into three main components:
- *An action or performance verb* that identifies the performance
- *A noun* that specifies what will be demonstrated
- *Other criteria* that specify the purpose of the performance (if appropriate)

Examples of learning outcomes:

Domain	Action or performance verb	Noun	Other criteria
Knowledge	Explain	the patient characteristics	that may affect treatment planning
Skill	Classify	injuries	to select optimal treatment
Attitude	Recognize	the need to refer the patient	to another specialist

This way learning outcomes can be used as an "audit tool" to guarantee that the learning experience will generate the required result.

"If you don't know where you are going, any road will get you there."

Lewis Carroll;
(1832–1898)
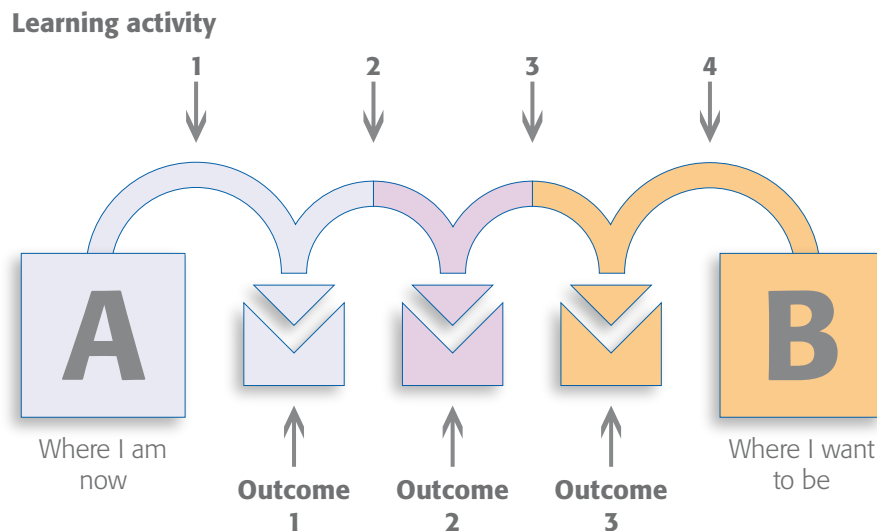English author (Alice's Adventures in Wonderland)

How to structure the learning experience

> "We should be as concerned with how we teach as we traditionally have been concerned with what we teach."
>
> John T Bruer;
> author and researcher

Learning activity

A — Where I am now

Outcome 1 Outcome 2 Outcome 3

B — Where I want to be

Remember this…

How you engage people at the very start can influence the rest of the learning session. An attention grabbing starter activity might be…

…a mini-quiz

…a thought-provoking question

…a striking image

…a video clip

…a recorded speech

…a "live" performance

…a surprise guest

Research

shows that structuring learning—by dividing lessons into episodes or sections—helps to maintain pace. It is also a challenge and thus enhances the learning experience.

Think about dividing a learning session into three elements: set, dialogue, and closure.

Teachers often make the mistake of neglecting the first and last (set and close) in favor of cramming in as much content as possible. This actually has often the opposite effect: People learn less, not more.

Set

The first part of a learning session should set the scene:

- Roles and outcomes—what are you going to do and what do you want the learner to do?
- Context—where does your session fit in to the rest of the course?
- A short interactive starter activity can be used to get the session off to a flying start: engaging learners and sparking their interest.
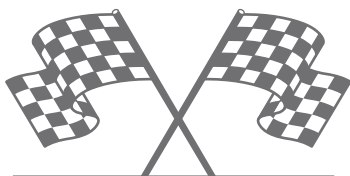
Dialogue

The second part of a learning session should be structured as a series of episodes:

- 3–5 major learning points only! It is tempting to cram in as much as possible, but learners will not be able to manage more.
- Devide the session into 10–15-minute sections! Most people cannot concentrate longer than this.
- Spice the content up with relevant cases and exciting stories.

Closure

The third part of a learning session should have a closing or plenary element:

- Actively engage learners and encourage them to reflect upon and articulate their learning
- Fully debrief outcomes of a practical exercise, discussion, or debate
- Clarify, consolidate, and extend the learning and how it may be transferred and applied
- Summarize key messages and emphasize the learning outcomes that have been achieved
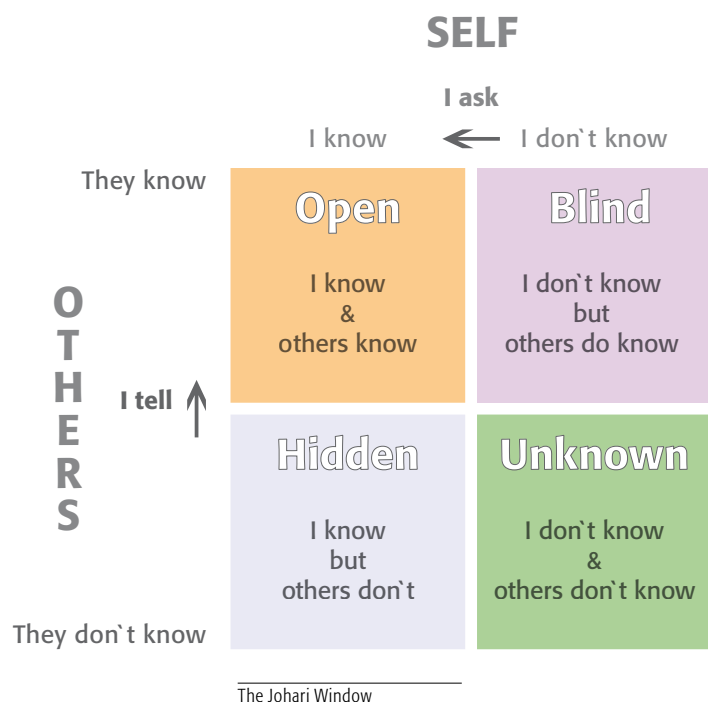
Knowledge check

Giving feedback

SELF

I ask

I know ← I don`t know

They know

Open	Blind
I know & others know	I don`t know but others do know

O T H E R S

I tell ↑

Hidden	Unknown
I know but others don`t	I don`t know & others don`t know

They don`t know

The Johari Window

Since early childhood, we have all been subject to a range of feedback that has helped to shape our behavior and development. Children are told off when they are naughty and get positive feedback when they have done well by conforming to adult expectations.

The Johari Window, named after the first names of its inventors, American psychologists Joseph Luft and Harry Ingham, is one of the most useful models describing the process of human interaction. A four-paned "window", as illustrated above, divides personal awareness into four different types, as represented by its four quadrants: open, hidden, blind, and unknown. The lines dividing the four panes are like window shades, which can move as an interaction progresses.

Applying the Johari window one understands the process of personal development through *disclosure* (telling others about yourself) and *feedback* (receiving information about yourself from others).

As a teacher think about giving and receiving feedback as an essential feature of the learning process.

Giving Feedback

Encourage "self-review" first, so that learners have a chance to identify their own strengths and weaknesses.

Give positive feedback to confirm success and achievement. Positive reinforcement—such as the recognition of a successfully completed task—releases the neurotransmitter serotonin in the brain, which releases feelings of well-being and provides conditions for better thinking.

Using constructive feedback is better than criticism if problems occur. Make only two to three suggestions on how to improve—any more than this will be difficult to retain and act upon.

Planning self-improvement

Seeking feedback is also a vital part of teacher and learner development:

Feedback from learners—first, ask the learners for their opinion.

Feedback from faculty members—ask a trusted colleague who can spend some time observing.

Identify key areas for monitoring—do I give enough personal attention to each learner? How well do I explain things? Could I use more questions to deepen understanding?

Remember this...

When giving feedback, follow these rules:

- Make it immediate and specific
- Make it actionable
- Make two to three suggestions on how to improve
- Do not incorporate threats or sanctions
- Involve the learner, peers, and others
- Make feedback an essential part of a learning cycle
- Praise, praise, praise

AO Foundation vision and mission

Our vision is excellence in the surgical management of trauma and disorders of the musculoskeletal system. Our mission is to foster and expand our network of health care professionals in education, research, development and clinical investigation to achieve more effective patient care worldwide.

"If you want to know the taste of a pear, you must eat it. If you want to know the revolution, you must take part in the revolution. All genuine knowledge originates in direct experience."

Mao Zedong;
(1893–1976)
founder of the People's
Republic of China