

Faculty Support—eLearning

Module 3

Running a practical exercise

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



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For best use...

The “Running a practical exercise” module consists of this booklet and an online course.

Booklet:

Designed to provide guidance on how to run a practical exercise.

Online component:

- Knowledge check
- Summary

Learning outcomes

After completion of this module you should be able to:

- Define and explain the role of a practical exercise.
- Identify the 4 key stages in teaching practical skills.
- Describe the rationale for each of the 4 stages.
- Set learning outcomes.
- Chunk a practical procedure appropriately (CCTV, video/DVD).
- Lead a learning activity at a practical table.

There are five modules that compliment each other. Together they give a thorough overview of the most relevant aspects of teaching.

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



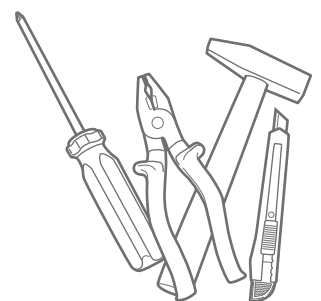
Summary

What is a practical exercise?



"I hear and I forget. I see and I remember. I do and I understand."

Confucius;
(551 BC–479 BC)
Chinese philosopher



Remember this...

Effective practical exercises are interactive and hands-on.

Providing the opportunity for course participants to handle and apply specialized equipment and practice new techniques is an extremely successful element of AO Courses. To meet expectations, practical exercises must be highly interactive learning activities and integrated with the course content.

To deliver a structured activity that fulfills learning outcomes, faculty are responsible for creating an environment that encourages all to develop and practice their newly acquired skills.

Defining a practical exercise

An exposition provides a learning experience. Practical exercises are structured and interactive learning activities that are guided by several faculty members and include:

- Demonstration of a new skill or procedure.
- Explanation of the steps/skills that are required.
- Opportunity to talk through procedure and demonstrate understanding.
- Practicing new skills with supervision.
- Reflection on performance.
- Receiving feedback and support.

Practical director

A practical director *sets up and introduces the practical exercises*. He is responsible for carefully planning the session well in advance. To prepare an effective and stimulating session that meets the expectations of participants, it is recommended that the practical director:

- Follow teaching for learning principles as described in Module 1 of this primer.
- Focus on learning outcomes.
- Communicate high expectations to course participants.

Table instructors

Faculty who assume the role of table instructor work with the director to *ensure one-on-one instruction and support* is given to all participants during the practical exercises. To provide this important level of support it is recommended that table instructors:

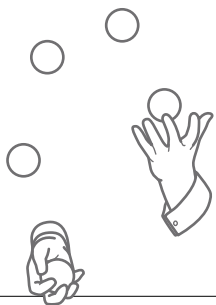
- Deliver consistent, constructive feedback.
- Work within their assigned group.
- Carefully observe and interact with all group members at their table.

The role of practical exercises



"The art of teaching is the art of assisting discovery."

Marc Van Doren;
(1894–1972)
American Pulitzer Prize-winning poet and critic



Remember this...

Practical exercises should:

- Allow learners to develop, practice and improve their skills, and change behavior.
- Reinforce complex theories and techniques with hands-on experience.
- Stimulate psychomotor skills.



Why do we use practical exercises? Because they are effective tools that allow participants to transform theories and techniques into concrete skills. A number of educational methods should be employed when teaching procedural skills.

Traditionally, medical education has consisted solely of the lecture, relying on verbal descriptions and visual aids to illustrate a procedure. Although this approach can be an effective way to teach theoretical concepts and underlying principles (the cognitive learning domain), it does not allow learners to develop the psychomotor skills they require for carrying out a complex task.

Let's refresh our memories of the three learning domains that were introduced in Module 1 "How people learn".

The three domains are:

- *Cognitive (knowledge)*
- *Psychomotor (skills)*
- *Affective (attitude/judgment)*

Each learning domain requires an appropriate (and often different) teaching approach. Practical exercises focus on refining psychomotor skills.

Psychomotor skills

Learning complex sequences of actions requires perceptual information (input from the eyes, for example) and control of the muscles. Combining this information allows the muscles to perform in the required way. From tying shoelaces to conducting a surgery, all complex actions rely on psychomotor skills.

Here are some key points to remember when teaching these skills:

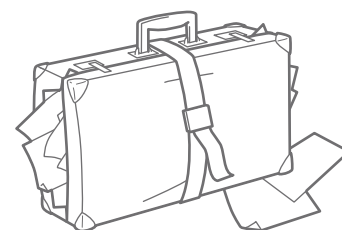
- A skill is not a reflex action.
- Complex movements require practice.
- Reinforced practice allows skills to develop quickly.
- Environmental factors (heat/cold, amount of oxygen, and noise) can interfere with acquisition and performance of psychomotor skills.
- Feedback, motivation, and practice affect the acquisition of skills.
- The more specific the feedback received, the faster the learner is able to develop a skill.

Advance preparations



"To be prepared is half the victory."

Miguel de Cervantes Saavedra;
(1547–1616)
Spanish novelist, poet, and playwright



Remember this...

When discussing outcomes, use verbs that specify distinct, observable and measurable actions.

Apply • Assemble • Assess • Build • Classify • Compare • Conduct • Construct • Contrast • Demonstrate • Describe • Evaluate • Explain • Identify • Judge • List • Perform • Practice • Relate • Select • Specify • Write

Planning in advance is vitally important for practical exercises to run smoothly. Like any learning activity, these need to be structured and focused on learning outcomes.

Learning outcomes

Communicate outcomes from the learner's point of view. Explicitly state what they will be able to do at the end of the practical exercise. This will help your preparations, as well as make the goal of each exercise clear to participants.

Avoid outcomes that start with verbs that are hard to interpret and measure, such as, to understand, know, learn, grasp, be aware of, enjoy, or believe.

Equipment

Most problems related to equipment can be alleviated in advance. Take the following measures to ensure all necessary materials are available *before the course begins*.

- Check that there are sufficient numbers of artificial bones, instruments, and implants available or on order.
- Review all video/DVD material to check that it matches the teaching and learning requirements.

- Table instructors need to preview the video material so that they know what they will be demonstrating/supporting.
- The use of a CCTV system needs to be planned and set up with additional material, such as a flip chart to write learning outcomes or key steps through the practical.

Learning activities

Perform the following checks to make certain that the planned activities will unfold as you anticipate.

- Are the learning outcomes supported by the planned practical exercise?
- Are activities divided into manageable pieces? (see next section)
- Has enough time been allocated for each activity? Include time for supervised practice, feedback, and evaluation.

Managing the learning environment

Many participants require a large number of tables/work-spaces/screens to ensure each learner has the opportunity to get valuable hands-on practice and clearly see the demonstrations.

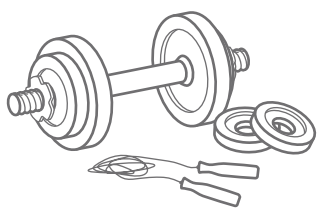
Structuring the practical



“Order is never observed; it is disorder that attracts attention because it is awkward and intrusive.”

Eliphas Lévi;
(1810–1875)

French occult author and
magician



Remember this...

Prepare all participants for a successful exercise before you begin.

- Set the scene by providing a context for the activity.
- Create a relaxed, enjoyable atmosphere.
- Be concise, especially when giving instructions.
- Set your ground rules: all activity and discussion stops during demonstrations and video sections.



Practical exercise sessions should be planned and structured as carefully as a lecture, debate, group discussion, or any other learning activity. As discussed in Module 1 “How people learn”, divide the session into three sections: set, dialogue, and closure.

Set

Before participants arrive there are a number of important tasks that should be completed:

- Ensure the room is a comfortable temperature and outside noise controlled.
- Does all the equipment work? Do you know how to use it?
- Discuss requirements with technicians and the CCTV camera operator.
- Are projector screens adequate and visible?
- Is the sound system audible?
- Organize the room and equipment.

Once these items have been addressed, you are ready to welcome the course participants and introduce the session. Keep introductions brief and to the point.

Dialogue

Keep in mind that adult learners need to know the application of what you want them to learn or do. *Grab the attention of the learners by stressing clinical relevance and how their surgical performance will be enhanced by the activities.*

- Divide the content into short, manageable sections.
- Do you have the undivided attention of all learners?
- Engage the participants – discuss learning outcomes and your expectations.
- Ensure all participants are advised about health and safety issues.
- Outline the structure of the session.
- Introduce the exercise.
- Apply the four-step approach to teaching a practical skill (see page 8).
- Provide meaningful feedback using the four-step model (see page 9).

Closure

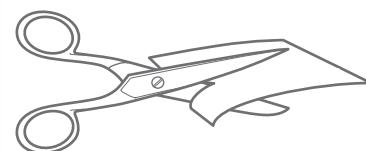
- Reflect on outcomes and key learning points.
- Address questions.
- Summarize main points.
- Deliver a final “take-home” message.

Structuring the practical



"Order and simplification are the first steps toward the mastery of a subject."

Thomas Mann;
(1875–1955)
German writer, philanthropist,
and Nobel Prize laureate

**Remember this...**

- Clearly state the exercise objectives and display the learning outcomes.
- Exhibit and name all materials and tools.
- Present the finished result before beginning.

Divide the content

Attempting to teach an entire set of skills from beginning to end, in one go, is not likely to be successful. When pilots learn to operate an aircraft they do not receive one lesson that sums it all up and then hit the runway. Many hours of course work, simulations, and supervised flights are needed before they are qualified to fly a plane.

Approach practical sessions in a similar manner by breaking up the content into small, manageable pieces that focus on a single new key skill at one time. This will build the skill-base in a logical fashion and result in a higher retention of information.

- Each section should be short and related to a specific skill expressed as an outcome.
- Emphasize the key steps in each section.
- Identify appropriate video clips to support the steps.
- Present the sections in a logical, sequential order.
- Make sure you have covered any prerequisite skills and/or knowledge.
- Structure each section using the four-step approach (see page 8).

Simulations

The aviation industry uses simulations to train pilots because they are a great way to teach and hone psychomotor skills. We can also incorporate fun simulations designed around learning outcomes. For example, a Meccano helicopter model can be used to demonstrate and develop a range of psychomotor skills using engineering principles that are similar to those needed for fracture surgery reconstruction.

Set the scene

When you are ready to begin a practical exercise, display all of the "parts"/implants, tools, and instruments that will be required. Lay them out and name each piece to ensure learners know what each is called. This step assists the learner to comfortably identify the materials they need.

Don't forget to *show the finished result/construct at the beginning* so learners know what they are aiming for. Having the finished picture in their minds helps put each stage of the procedure into context—a little like showing the picture of the finished dish in a cookery book.

Surgical procedures require psychomotor skills—complex movements that require practice, motivation, and feedback.



"The man who can make hard things easy is the educator."

Ralph Waldo Emerson;
(1803–1882)
American essayist,
philosopher and poet



Remember this...

Incorporate the four-step approach to your teaching.

1. Demonstrate the skill in silence.
2. Show the task while giving verbal explanation.
3. Learner talks through the task.
4. Task performed by learner.

Four-step approach to teaching practical skills



Throughout each practical exercise, the following four-step approach should be used to teach each component of a complex procedure. Learners need to fully concentrate on the demonstrations and see and hear the correct techniques (step 1 and 2). Make sure all discussions and hands-on work have stopped before the next section of learning is shown on the CCTV or DVD screen.

Step 1: Silent demonstration

- Faculty models the skill in silence or with minimal dialogue.
- Learners focus purely on the physical movements of the task.

Step 2: Demonstration with explanation

- Task performed again by faculty, broken down into stages and with a clear, concise explanation of what needs to be done at each stage.
- Highlight key points and exaggerate movements/actions.
- Check that learners understand what they need to do at each stage.

Step 3: Learner talks through the task

- Learner talks through the tasks' steps while faculty performs the task.
- Articulating the process is an excellent way for learners to assimilate key components of the correct technique.

Step 4: Learner performs task

- Learner performs the task and talks through what they are doing.
- Faculty observes, supports, and provides feedback.
- **IMPORTANT:** 50% of session time needs to be allocated to this step; repetition is key to learning psychomotor skills.

This four-step model is very effective for teaching a practical skill. It can also be used when learners are taught in groups supported by a practical director and table instructors.

On these occasions, steps 1 and 2 may be combined in a teaching video/DVD or carried out by the practical director on the CCTV. The table instructor will then take over the role of "teacher" for their group, by recapping key points (from step 2) and then facilitating steps 3 and 4.

Four-step approach to teaching practical skills



“We need very strong ears to hear ourselves judged frankly, and because there are few who can endure frank criticism without being stung by it, those who venture to criticize us perform a remarkable act of friendship.”

Michel de Montaigne;
(1533–1592)
French Renaissance writer
and essayist

Learner's viewpoint

- Step 1: Observe
- Step 2: Hear explanation
- Step 3: Talk through
- Step 4: Perform task

Timing

Avoid rushing or running over time. It is better to cut out the last section and do three-quarters correctly than to rush through a full practical.

Providing constructive feedback

Time for reflection is very important. After the practical session, give participants time to think about what they have learned and then begin the formal feedback process. Feedback can be provided on each individual skill and/or for the whole practical exercise.

Learning is consolidated through reflection and feedback. Delivering feedback that isn't necessarily positive can be difficult, in fact it is a bit of an art form. However, this job can be easier if you have the right tools. We suggest structuring your communication using the following four-step method:

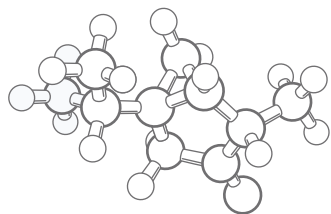
- Step 1: Ask the learners what went well.*
- Step 2: Tell the learners what you thought went well.*
- Step 3: Have the learners describe what they would do differently next time. Discourage them from using negative language or focusing on mistakes.*
- Step 4: Summarize and confirm what you would like them to do differently next time.*

Trivia: What is the shortest word in the English language that contains the letters: abcdef? Feedback—one of the essential elements of good communication.

Closing the session

Every teaching session needs to be brought to a close.

- Show the finished result to remind learners of what they have achieved.
- Summarize the key learning outcomes.
- Concentrate on positive aspects of the session.
- Invite questions.
- Provide clear explanation of any next steps.
- Finish with a strong, positive “take-home” message.

**Remember this...**

Structure is required when teaching practical skills.

- State learning outcomes before beginning.
- Use the four-step approach.
- Ensure learners and table instructors use same techniques.
- Allot ample time to practice skills.
- Table instructors should always be observing and provide immediate feedback.
- Structure your feedback constructively.
- Summarize with a simple, strong “take-home” message.

The role of the table instructor

The most important feature of the practical exercises is the hands-on practice the learner receives. However, for this hands-on element to be really successful the table instructor needs to readily reinforce the correct procedure and give constructive feedback.

It is of utmost importance that table instructors explain the steps shown in the practical exercise video and discusses the principles involved before learners begin with the hands-on practice.

Refer to page 12 of this booklet for a handy checklist that has been prepared especially for table instructors to use while preparing and conducting the exercise.

Faculty pitfalls

Here is a short list of some common mistakes made by faculty that impact the quality and continuity of a practical exercise.

- Lecturing at the workstation instead of performing the skill.
- Faculty doing the skill instead of allowing the participant to perform the skill.
- Disinterested faculty talking on the sidelines, leaving participants

unsupervised.

- Conveying an “I-don’t-use-this-implant” attitude.
- Unfamiliarity with the equipment or instruments.
- Telling learners that you have a better way of performing the skill than the demo video shows.

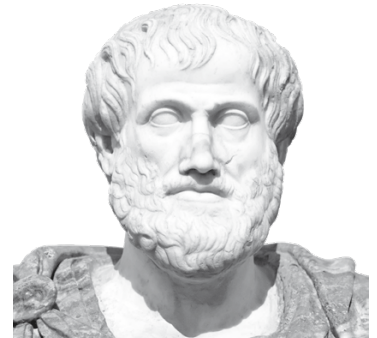
Coaching: an ongoing process of providing people with the tools, knowledge, and opportunities they need to develop themselves and become more effective.

Student pitfalls

Course participants can display behaviors that are disruptive and negatively impact their learning experience as well as the experience of those around them.

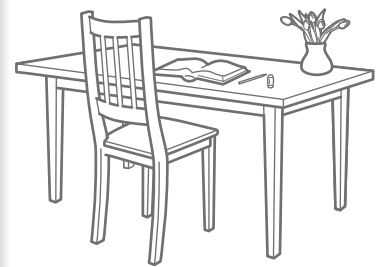
- Talking during demonstrations and Video/DVD performances.
- Taking pictures or video instead of doing the exercise.
- Experimenting with unsolicited or untaught techniques.
- A general lack of interest.
- Not interacting with other participants.
- Inappropriate levels of participation: monopolizing the group or rushing ahead, to being too complacent.

Managing groups effectively



“Excellence is an art won by training and habituation.”

Aristotle;
(384 BC–322 BC)
Greek philosopher



Remember this...

To create an optimum learning environment:

- Communicate optimism, energy and high expectations.
- Establish ground rules.
- Foster an atmosphere that encourages discovery.
- Accommodate different learning styles.
- Use constructive feedback to enhance self-esteem.

A practical exercise session can provide a rich learning environment where group interaction helps create valuable collaborative learning experiences. People learn a lot when they observe their peers problem solve, share ideas with each other, and assist with a task. The reactions of our peers, both verbal and nonverbal, are another important source of information (feedback) for a learner to evaluate their own performance.

The challenge for faculty facilitating group exercises is to manage the dynamics to maximize the experience for all.

Assign the groups

Encourage learners to work with people from other regions/backgrounds. Organize the groups in advance to minimize the tendency of people to stay in regional/gender groups.

Expect language barriers

There are likely to be learners whose language skills result in poor comprehension. Deliver explanations at a slower pace and encourage those with a common language to assist.

Beware alternate agendas

Some learners may not participate if they

have set other priorities for the session, such as catching up with a colleague or taking pictures/videos. Try to encourage these learners back on task by asking them a question and then providing them with a challenge or activity to complete.

Direct disruptive or monopolizing learners

Sometimes a dominant personality may make it difficult for other students to be heard. Acknowledge these learners and their point of view, then move on and invite questions/participation from others in the group.

Silence the chatterboxes

These learners can be very disruptive, especially if they cannot resist talking during demonstrations. Remind them of the ground rules, pause the video if necessary. Never try and speak while they carry on their conversations.

Engage the silent learners

Some learners may seem unwilling to contribute or not be interested at all. Try to engage them by asking for their help. Identify some common ground to relate to them. If they are anxious learners, they will also need lots of positive reassurance.

Table instructor checklist



“Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity.”

General George Patton;
(1885–1945)
American army general

Before the practical



Read this booklet.	
Internalize the four-step approach to teaching practical skills and giving meaningful feedback.	
Familiarize yourself with the exercise procedure. <ul style="list-style-type: none"> • Watch the demonstration video. • Practice how you will explain and demonstrate each section. • Check that you are familiar with equipment, instruments, and implants—they may differ from what you use at your institution. 	

During the practical



Get to know the learners at your table—their needs, motivations, and perceptions.	
Reinforce the demonstration before the learners start the hands-on exercise.	
Stick to the script—don't show off.	
Use coaching skills: <ul style="list-style-type: none"> • Let the learner discover the right way. • Discuss what they are doing to confirm they understand their actions. • Help them to reflect on their successes and areas in need of improvement. 	
Be aware of the time. Don't let your table fall behind or jump ahead.	
Deliver constructive feedback.	
Provide positive reinforcement and lots of 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.
