EPEC-O

Teach 2: Teaching Skills 2

National Cancer Institute

Introduction

The EPEC™-O Curriculum has been designed to incorporate a variety of instructional methods. It supports the teacher in using a variety of techniques.

This plenary explores specific teaching techniques: lecture, case-based/small-group, and role-play. It also explores the use of videos and visual aids, which can be used with any of the techniques to enhance learning. The overall goal of this plenary is to equip the teacher with the knowledge to apply these various techniques. The teacher will want to choose the techniques that are best able to deliver the intended learning objectives. This plenary builds on the skills described in the first teaching plenary.

Key words

Lecture, case-based, small-group, role-play, video, flipchart, standardized patient

Objectives

After reviewing this session, oncologists and other members of the cancer care team will be able to:

- Present an effective didactic lecture.
- Facilitate a small-group case-based discussion.
- Facilitate a skills practice (role-play) session.
- Facilitate discussion.
- Use visual aids effectively.
- Compare and contrast problem-based with case-based teaching.
- Describe the teaching approach using standardized patients.

Video Vignette

Using video clips from previous EPEC™ train-the-trainer conferences, this video presents a variety of different approaches to engage participants during large-group didactic presentations and small-group case-based discussions.

Didactic lectures

What: The lecture method is a standard technique for delivering information. When the content is relevant to the needs of the learner and when the speaker is motivating and interesting, the lecture format can be an effective learning modality.[1]

Why: The lecture method is efficient when a large amount of information needs to be imparted quickly. It is also a way for a content expert to reach many learners at one time.

Limitations

There are some limitations of the lecture method, particularly if it is used extensively over a prolonged period of time. These limitations include the following points:

- Lecture is a passive form of learning designed to transmit knowledge. If the goal is to learn new skills, techniques other than lecture must be used.
- Lecture appeals primarily to learners who prefer auditory modalities. The use of visual aids as part of a lecture (such as slides) can be used to appeal to visual learners. The provision of a handout that permits the taking of notes appeals to kinesthetic learners.
- Lecture assumes that all learners need the same information at the same time and at the same pace.
- During a lecture, the attention span of participants tends to decrease with each passing minute. Psychometric evidence indicates that humans can maintain attention for about 10 minutes before attention begins to wane. Skilled lecturers therefore structure their lectures to permit pauses or incorporate changes to restimulate attention (like showing a video, asking for comments or questions).

The lecture method in EPEC™-O

Each module has a set of slides, a printout of the slides for use as a note-taking tool, and a text than can be reproduced for participants to take home. In addition, each module has a Case Study Vignette to stimulate interest.

When teaching an EPEC™-O module, make explicit decisions about which content is relevant to the learners.

Practice your presentation to be sure it fits the timeframe. Nothing is more annoying to a participant or more counterproductive than a speaker who either speeds up or jumps over material the participant wanted to learn.

If you are planning a lecture to be given in 1 hour, plan to spend no more than 35 minutes in slide-based content. The remaining time will be taken up with introductions, comments, questions, and/or other activities that involve participants in thinking about and applying what they are learning.

A set of teaching notes accompanies each module to provide advice as to how specific modules can be taught. Suggestions are included on how to make lectures more active as well as how to use case studies and role-plays to spice up the training.

Making lectures part of active learning

Lectures are, by nature, a passive form of learning. However, there are ways to increase the effectiveness of lectures by combining lecture with techniques of involvement and participation. It takes some careful planning, but some suggestions for making the lectures more active are listed below.

- Plan how to grab the attention of the audience in the first few seconds of the presentation. Ways to do this include describing a particularly arresting or disturbing case from your experience or known to the participants. It could be a

startling or troubling piece of evidence from the literature or the media. The Case Study Vignettes can serve this function as well.

- Explain why the subject matter is important.
- Explain what will be covered and involve participants in determining the focus of the learning.
- Use personal anecdotes or case studies and examples throughout the talk to reinforce key points. Don't be afraid to use cases where things didn't go well. These will be easily identifiable to the audience and will help them see how the new information can be used to "solve" the problem.
- Provide opportunities for participants to reflect and record their own thoughts and questions related to a specific topic.
- Use visuals: slides, videos, flipcharts, handouts, etc.
- Stop periodically so participants can discuss key points if they wish or engage them in an activity that will help them reflect on or see how to apply what they are learning.
- Provide opportunities for participants to share their experience with each other. This can be done in the large group, small groups, or pairs. (These are sometimes called "buzz groups.") The exchange of experiences is especially helpful in the modules that focus on the humanistic components of palliative care.
- Use audience response systems to answer questions.
- Involve participants in actively summarizing the key points of the lecture. This can include asking participants to reflect on the lessons so far or having them apply the key points to a case study.

Case studies

What: Case studies are an effective way to get participants involved by having them apply what they are learning. Case studies provide a description of a situation with enough detail to allow analysis of the issues and problems involved and to decide on possible responses.[2]

Why: Case studies can be used to stimulate issues and questions, reinforce or explore the application of a specific concept, and help pull together and summarize everything participants have learned. Case studies are sometimes used to provide content that otherwise would need to be covered in a lecture.

Creating a case study

The EPEC™-O modules include case studies that can be used. However, it is easy to develop your own case study. Unfortunately, it is also easy to develop a confusing or ineffective case study. By following a few simple steps, an effective case study can be written that serves the educational needs at hand:

- Identify the specific goal or learning objective you want to achieve with the case study. Generally speaking, there should be only one major learning point or goal

for any individual case study. This is the area where mistakes are most frequently made. Teachers choose the most interesting or most complicated cases and, consequently, participants can become confused by the complexity. Keep it simple.

- Use a real case. This approach infuses the case with realism that participants can relate to. It also conveys a sense of expertise because the speaker has "been there."
- Omit information that is not essential to the learning objectives. The goal is to generate interest and discussion. Do not confuse the case description with a written history and physical examination for the chart or a case report for the medical literature. The more information provided, the more likely participants are to focus on extraneous information. In addition, what often happens when too many variables are added to a case study is that participants debate approaches or methods that are unrelated to the intended goal. Help participants master their learning points and then, in large or small-group discussions, explore potential variables that may make the scenario more complex.
- After a case has been written, ask peers to review the case with an eye on the key teaching point. These reviewers can provide input into whether or not the case is likely to address the teaching point. This review will afford the opportunity to make revisions before the case is used with learners.

Facilitating activities using a case study

- Prepare the activity
- Know the educational goals of the activity.
- Review the directions and material for the case to become completely familiar with the content and process.
- Determine the time limit for the activity and strategize how to adhere to this time line.
- Gather/prepare any additional materials needed (e.g., flipchart with instructions or tips, case materials).
- Determine how to best monitor and debrief the activity.
- Determine how to divide the participants.

Introduce and monitor the activity

- Introduce and explain the purpose of the activity.
- Clearly explain the directions and the timeframe.
- Explain the expectations for outcomes from each group or individual (e.g., a brief report back, key points written on a flipchart).
- Suggest that participants begin with an overview of the case to identify the key problems and underlying issues before they try to solve the problem or answer the questions that have been posed.

- If appropriate, review the key principles participants should apply to the case.
- Ask if participants have any questions before starting.
- Circulate among the groups/individuals and answer questions as needed.
- Periodically let participants know how much time they have remaining before rejoining the large group.

Debrief the activity

- Provide an opportunity to debrief the case so that learners can think about how they would apply the learning from the case to their own environment.
- Based on time, have a few or all of the small groups or individuals report on the outcomes of their work.
- Encourage feedback and questions from the groups. Trainers should provide feedback as well, if appropriate.
- Summarize the key learning points of the discussion and any open issues or questions. Record these key points on a flipchart to leave posted in the room.
- Explain how this activity links to the next part of the session.

Skills practice (role-play)

What: In a role-play, participants actually have a chance to practice a particular skill, such as conducting an assessment for depression or presenting a Phase I study to a patient. Role-plays can be conducted in two ways:

1. Fish bowl. A pair of participants comes to the front of the room. They conduct the role-play.
2. Small groups. These can be in pairs or small groups of three. This allows one person to be in the physician role; one person to be in the patient, family, or other role; and one person to observe and give feedback. Roles can be rotated to allow each person the opportunity to practice, if time allows.

Why: This technique provides the closest experience to actual application of skills that can be achieved in a classroom setting. It involves the learner in practicing a skill and getting immediate feedback.[3]

Standardized patients represent a more advanced aspect of role-play, where the person in the patient role plays it from a predetermined script that is reproducible across multiple learners.[4]

Conducting role-plays

- Review the goals and instructions for the activity and clearly identify the roles to be used.
- Prepare instructions for the activity on a flipchart in advance to ensure that all key points are covered.
- Determine the time limit for the activity.

- Determine how to divide the participants for the activity.
- Determine how to best monitor and debrief the activity.

Introduce and monitor the activity

- Introduce and explain the purpose of the activity.
- Clearly explain the directions and the timeframe.
- Clarify the roles, the actions that should occur, and the setting in which the role-play is to occur.
- Explain the process each small group should use to debrief (see below).
- Encourage learners to stay in their roles.
- Explain that the observers should look for specific behaviors exhibited by both the physician and the patient. These observations may be of great help in deciding whether to apply the role-played actions in the real world.
- Clarify that participants can call "time out" to stop a role-play if an issue develops that needs to be discussed in order to move forward in the role.
- Ask if participants have any questions before starting.
- Circulate among the groups and answer questions as needed.
- Periodically let participants know how much time they have remaining. If the exercise calls for participants to rotate roles, let them know when to rotate.

Debrief the activity

- Debrief within each small group. Start with reactions from the physician, then the patient, then the observer. Each person should include:
  - General reactions about how they felt in the role.
  - What they think went well.
  - What they would do differently.
  - Specific behaviors that worked or did not seem to work.
- Debrief with the large group. Ask each small group to comment on one key lesson learned and record these on a flipchart to post.
- Encourage feedback and questions from the groups.
- Explain how this activity links to the next part of the module.

Facilitating discussions

What: The group discussion technique can provide variety and give participants a chance to reflect on what they are learning. The teacher may also ask someone from the group to help record key points from the discussion.

If the group is too large for a convenient discussion, a variation of the discussion technique is to divide the large group into smaller groups of three to five people and provide them with one or more topics to discuss. Each small group can select a spokesperson to report back to the large group on their findings. The teacher can then

facilitate the discussion from these reporters and help the group discover similarities, differences, and key points.

Why: Adult learners have a need to share their own experiences, hear the experiences of others, and relate these experiences to what they are learning.

Using discussion in EPEC™-O

Each module can be taught using group discussions. Discussions can be introduced between slides as part of a lecture or can serve as the main teaching technique. The effectiveness of group discussion in achieving the educational goals depends on the ability of the teacher to effectively facilitate a discussion.

Facilitating large-group discussions

Some tips on facilitating discussions within a larger group are provided below.

In preparation

- Identify the goals and key points to be covered.
- Make a list of open-ended questions that will elicit the key points.
- Determine the timeframe for the activity.

During the activity

- Explain the purpose of the activity.
- Ask open-ended questions.
- Allow time for participants to respond.
- Encourage participation by linking comments and calling on specific individuals for their opinions.
- Stay flexible; don't force a desired point if it is not offered—offer it at the end of the session if a participant does not mention it.
- Provide positive reinforcement for participants' comments.
- Respond to questions.
- Periodically review and tie back to the key learning points.
- Summarize the conversation and record key points on a flipchart (or ask someone to be a scribe to record key points).

Questioning techniques

Skillful questioning is the key to effective facilitation. Through questioning, the facilitator can achieve numerous objectives. Some of these objectives and examples of questions are listed below:

Table 1: Objectives and Corresponding Sample Questions

To open a discussion	"How is advance care planning helpful?"

To make a point	"Why do you think the patient's mother was upset?"
To check understanding	"What is the gold standard in this case?"
To surface new ideas	"How else could he have approached this problem?"
To keep on track	"Can we go back to John's problem with breathing?"
To bring out feelings/attitudes	"How would you feel if you were confronted by her?"
To bring out reactions to a point	"How do the rest of you feel about Carol's point?"
To suggest an approach/idea	"What do you think would have happened if…?"
To broaden a discussion	"What other factors might be important here?"
To explore different approaches	"What approach would the ethics committee take?"
To advance a discussion	"What is the next step in the assessment process?"
To summarize	"What are the key points that we can take away?"
To move toward agreement	"Does this represent the thinking of all of us?"
To test ideas	"What would happen if we increased the dosage?"

As facilitators, trainers generally want to avoid answering their own questions. Questions should stimulate thinking and ideas from the group. This means that trainers need to be comfortable asking open-ended questions, allowing enough time for people to respond, asking questions of specific individuals, and diverting questions back to the group. There are four categories of questions that facilitate this approach:

Open-ended/general questions

Some questions can be thrown out to the whole group. It may be useful to ask the same question more than once to get different answers. Use these questions when the desired outcome is to give everyone a chance to respond. Note that these questions work best if they cannot be answered with "yes" or "no." Examples:

- "What is the philosophy of palliative care?"
- "How should we structure this session?"
- "Why else might that concept be important in your work?"
- "What have you learned?"

Questions directed to specific individuals

Use these questions to engage a learner who is not participating in the discussion. Always begin the question by stating the person's name so the individual knows he or she is expected to respond.

- "Jim, in your experience, what are the benefits of advance directives?"

- "Maria, do you agree with that approach?"

Redirected questions

A participant may direct a question to the facilitator to get his or her opinion. At this point the facilitator needs to decide if he or she will answer the question, redirect it, or both answer and redirect. Redirecting a question back to the participant is a way for the facilitator to avoid giving an opinion or answer, a way for the facilitator to encourage the participant to think for himself or herself, and a way to bring out opinions. Examples include:

- "Cathy, it sounds like you have some interesting experience with this. What is your opinion?"
- "Well, Thomas, how do you feel about the approach described?"

Questions relayed to other participants

An excellent way to get more people involved in the discussion is to use relay questions. Relay questions can be directed at one participant or to the group as a whole. They help the facilitator avoid giving an opinion or answer, get others involved, and, if appropriate, call on someone who is known to have related experience. Examples:

- "What do the rest of you think about this?"
- "John, how would you answer Ezra's questions?"

Answering questions

In general the facilitator should facilitate, not participate. If a facilitator participates too much in the discussion, he or she is setting himself or herself up as an expert. This will generally have a negative effect on participation from the other members of the group.

Trainers should give careful thought to how and why they are answering a specific question and use their best judgment based on the situation. Types of questions that trainers should answer include those asking for:

- Clarification of the goals of the activity.
- Clarification of the trainer's question.
- Factual information that the participant may have missed.

Acknowledging participation

The way a facilitator responds to participants in a discussion will impact how fully members will participate. The goals in responding to comments should be to remain open to a variety of ideas, thank members for their participation, avoid revealing personal feelings about a particular comment (either positive or negative), and be respectful of all contributions. Responding in this way will encourage positive participation from everyone.

There are a number of tactics trainers can use to acknowledge responses:

React neutrally: Convey interest and keep the person talking. Say things like, "I see," or "That's interesting. Tell me more."

Explore: Probe to gather more information and help participants explore all sides of an issue. Say things like, "What do you think the most important problem is that we need to deal with?"

Restate: Restate a participant's comment to show you are listening and encourage more participation. Say things like, "If I understand you correctly, your idea is…" or "So that experience was quite powerful for you. Am I correct?"

Summarize: Pull together different ideas and reemphasize key points of the conversation. Say things like, "So far we have heard three different ideas about how to handle that problem. They are…."

Provide input: Comment if you feel you have an important point to make that is not coming out in the discussion. Be careful not to do this too much or you will discourage participation from the group. Always try asking open-ended questions to elicit the point first, before adding it yourself.

Common problems in group interaction

For those occasional difficult participants who are "hogging" all the air time or doing something that is distracting to others, the following step-by-step approach usually works:

- Make eye contact.
- Move toward them; stand by them.
- Involve them.
- Use humor to make a subtle point to stop what they are doing.
- If these steps don't work, talk to them outside of the group.
- Last resort: Ask them to leave!

Using visual aids

Visual aids can augment educational sessions and can be used with a variety of instructional methods.

Slides

(Note: Intervening slides that are illustrative of each bullet point are available in the electronic file.)

The EPEC™-O Curriculum was developed with slides that were intended to be an important source of visual support to the teacher. It is important not to completely darken the room when projecting slides. See if the slides can be read without turning off the lights. If not, try decreasing the lighting. The darker the room, the more likely you are to

lose the attention of the participants. When slides are not being used, the slide projector can be turned off.

A neat trick if using computer-based POWERPoint is to push the "B" key to blank the slide if you are pausing for a few minutes.

New slides can be developed in POWERPoint using the same background as that of the existing POWERPoint presentation materials.

When making new slides, a few tips (listed in Table 2) will help you make them effective and avoid common pitfalls:

Table 2: How to avoid pitfalls when using slides

Use words or short phrases, not sentences.

Use more slides; don't put more words on a slide. General guidelines suggest using:
 	
   • Less than or equal to 6 words per line
   • Less than or equal to 30 characters per line
   • Less than or equal to 6 lines per slide

Plan on using about 1 slide per minute.
Use a clear, easily-read font without serifs (e.g., Arial).
Maintain font size greater than or equal to 32 point.
Use a limited number of high-contrast colors (e.g., white or yellow on dark purple).
Indent secondary and tertiary thoughts.
Use animation and text-building features sparingly.
Insert photographs of patients as cues for stories or examples.
Print out slides in the Handout format to help participants follow along and take notes.
Use the 8 to 1 rule for determining the size of the screen (e.g., a person 40 feet from the screen needs a screen at least 5 feet high)>

Videos

What: The Case Study Vignettes can be used to stimulate interest in the topic, identify issues, and establish the relevance of the subject matter. They are generally only a few minutes in length.

Why: The Case Study Vignettes provide a good vehicle for active learning because they can be used to identify key issues and stimulate discussion. Don't miss the opportunity to structure some type of activity/discussion around the Case Study Vignettes for each module, even if it is very brief.

Using EPEC™-O videos

Each module contains a description of the scenario in the Case Study Vignettes. You can enhance the effectiveness of the videos by asking participants to watch for specific behaviors or phrases.

Some tips for using the trigger videos include:

Preparation

- Always check the equipment in advance to ensure that it is functioning and operation is clear.
- Adjust the position for good visibility and make sure the sound level is appropriate.
- Make sure the videotape is inserted and set to the beginning of the segment to be shown.
- Find out how to get help if there are any technical difficulties.
- View the Case Study Vignettes in advance and make notes on key points to remember to bring out in the discussion.
- Review the instructions in the Guide for Trainers.

During the module

- Briefly introduce the Case Study Vignettes and explain the purpose.
- Review the instructions in the Participant's Handbook.
- Help participants focus on the right issues by providing direction on what they should look for.
- Suggest that participants may want to take notes as they watch the video.
- Show the video.
- Facilitate a discussion using the questions in the Participant's Handbook as a guide.
- Summarize the key points of the discussion and link this activity to the next part of the module.

If time allows:

- Ask participants to discuss one or two questions in pairs or threes and then briefly report back to the whole group a few key points from their discussion.
- Ask one or two people to share their own experiences in situations similar to the trigger video. Use guiding questions to elicit what they would like to do differently in the future.
- Ask the group, "Based on what you have seen, what key questions would you like to have answered by this module?"

Be sure to:

- Keep the discussions focused and adhere to the time lines.

- Manage expectations about what it will or will not be possible to cover in the 45-minute conference format. Explain how participants can get more information if they are interested.

Flipcharts

Flipcharts permit spontaneous capture of important information. Use flipcharts to record key learning points from discussion, questions that need to be answered, and instructions for activities will provide visual variety and help create a learning environment.

Some tips for using flipcharts include the following:

- Lettering should be at least 2 inches high in block letters to ensure that participants in the back can see clearly.
- Use dark colors (blue, black, brown, purple). Avoid using pastel colors (yellow, orange, green) because they are difficult to read at a distance.
- Label each flipchart page with a title, (e.g., "Cancer Pain: Key Issues").
- Make sure that a roll of masking tape is available so that pages can be placed on the wall for future reference. It helps to prepare pieces of tape to use for this purpose in advance.
- Keep it simple. Use key words rather than whole sentences.
- Use the participants' own words whenever possible rather than paraphrasing for them. This subtly encourages participants to be actively involved in the process.
- Consider asking one participant to act as scribe to record key points during a discussion. Be prepared to provide assistance to the scribe as needed to ensure that key points are recorded accurately.

Specific techniques for capturing ideas

Label a flipchart page "Parking Lot" or "Idea List" and post it on the wall. Use this page to record ideas or questions that come up that are not within the direct scope of the current activity/module, but need follow-up at a later time. Review the list periodically and address issues as appropriate. For the issues that will not be addressed by this program, assist the participant in finding out how to get more information. This technique also helps manage the flow of the discussion and keeps it from being sidetracked.

Use the Plus/Delta technique to structure ideas about what went well and what could be done differently. This technique can be used for the Case Study Vignettes or the case studies.

- Draw a line down the middle of the flipchart and label one column with a + and one column with a "delta" (Δ) for change.
- First, ask participants to list the positive points or the things that went well. Record these on the + side.
- Then ask participants to list the things they would change or do differently. Record these on the Δ side.

- Determine which ideas for change should be implemented.

Small-group problem-based learning

A variety of terms have been developed that describe the pertinent issues that have lead to small-group problem-based learning. Here are a few:

Teacher-centered, subject-based learning. This is probably most familiar to practicing clinicians. The teacher decides what the lesson plan will be, and the material that is covered centers on a particular subject.

Student-centered, problem-based learning. In this format, it is the student who largely sets the teaching agenda. The material to be learned is generated from the need to solve a problem.

Tutor/facilitator. This term is used in contrast to *teacher* to signify the role of the session leader. This person is an expert in the field, but functions by facilitating students' acquisition of knowledge rather than "teaching" it to them.

Hypotheses. In this context, these are ideas generated from an initial concept that drives a strategy of inquiry.

Learning issues. These include the material participants need to learn.

The problem-based method of learning is based upon the clinical reasoning process itself. When a clinician is faced with a clinical problem, he or she generates a number of hypotheses about what is causing the current problem. These hypotheses then drive a strategy of inquiry to solve the problem.

The clinical reasoning process is fundamentally about applying clinical skills to solve problems. In that sense it is a cyclic, reiterative process of analyzing problems, making decisions, seeing the results of those decisions, identifying new problems, analyzing them, etc.

Myths about continuing education

There are a number of prevalent myths about continuing education for health care professionals who have completed formal training. The first is that the lecture is a perfectly adequate learning method that will change the behavior of those who come to learn. A second myth is that physicians and other health professionals prefer to learn by the lecture method as opposed to other methods such as small-group-based methods. Another myth is that a large group of professionals needs to be educated in order to produce change. A fourth myth is that teaching needs to cover everything about a subject in order for the teacher to be a good teacher and the learner to "get something out of it." The beliefs that problem-based learning is boring and that health care professionals do not like to learn in small groups are other common myths.

There is a large evidence base that explodes each of the myths described above. Based on studies of continuing education methods for physicians, it is clear that interactive

education programs that enhance the learner's participation and provide the opportunity to practice skills can effect change in practice and, on occasion, in patient outcomes. By contrast, didactic sessions using the traditional formal lecture do not appear to be effective in changing physician performance. In other words, traditional large lecture-format conferences are ineffective in changing behavior.

Effective education

The evidence provides guidance about the kinds of educational sessions that are effective in changing the practice of health care professionals. These include:

Small-group sessions. Learners interact in groups of 5 to 15 and interactively engage in the material to be learned.

Outreach visits. These include academic detailing, in which an expert visits a clinician on a 1:1 basis for short periods in the clinician's work setting to discuss focused content areas.

Multi-faceted programs. Multiple learning modalities are combined in a conference setting so as to maintain learner interest and stimulation.

Reminder notices. These can be faxed or mailed, or may appear on computer screens or in the medical records of patients being seen. An example is a notice from the pharmacy when certain drugs are prescribed.

Patient-mediated interventions. Real patients or simulated patients are used as part of the education, lending it the context of being "real."

Opinion leaders. People to whom the clinician looks for guidance or approval have strong effects on what is learned and adopted as part of standard practice.

Why problem-based learning?

Problem-based learning challenges a learner to draw on information that he or she has already learned in the past. Being challenged to elaborate on that knowledge at the time of learning enhances subsequent retrieval of the information when it is needed. The more closely the problem matches the clinical context in which the information is needed, the more likely it is that the learner will recall the information in the future.

In many ways, problem-based learning closely follows general principles of adult learning. In a variety of settings, it has been demonstrated that adults are more likely to learn if they see "what's in it for me." This contrasts with the traditional way that most are first introduced into education in grade school where the teacher decides what will be learned. The more an adult can articulate "What do I want to learn?" the more he or she is likely to get out of the education. In addition, adults are more likely to learn if the session actively engages them to participate and is intense and enjoyable, the educational materials are adjusted to their level, and they can see immediate results.

Problem-based learning techniques

In the teaching style that has come to be known as *problem-based learning*, the problem is introduced first—prior to the learner doing any study, preparation, or class work. The problem is realistic and pertinent to the learner. The learner works with the problem and applies current skills and knowledge before anything else is learned. In this way, the learner defines his or her own gaps in knowledge. These, in turn, guide the individual to study and learn in order to fill those gaps. This new knowledge is then applied to the problem at hand.

From this rationale, it should be apparent that the learning that comes from a problem-based method is active and student- centered. It requires an adult learner who has a measure of self-discipline and self-direction. The learning is centered on solving a problem. In the case of clinician education, it is clinical in context. It is integrated in the sense that aspects of multiple subjects may need to be learned and integrated in order to solve the problem. Because the learning occurs in the setting of a small group, the learning and problem solving are collaborative.

Several defining characteristics of problem-based learning have been described. The learning process involves both acquisition *and* application of knowledge. The process fosters the development of clinical reasoning skills, self-directed learning skills, and group interaction skills. A collegial, cooperative relationship develops between the learners, and between learners and faculty. Finally, time is protected for self-study.

Role of the facilitator

The role of the facilitator is different from that traditionally associated with a teacher. In problem-based learning, the facilitator enables others to learn rather than providing the learning. The facilitator is responsible for creating a learning environment that is informal and collegial, and is also responsible for setting the ground rules.

When exercising the role of facilitator, the leader is primarily responsible for guiding the group. A balance is struck between allowing inquiry of the group that may take it afield of the immediate learning objectives and keeping on track to meet the objectives in the time allotted. In addition, the facilitator is responsible for balancing the participation of the various members of the group. That includes managing, but not necessarily suppressing, conflict. The facilitator is also responsible for summarizing where the group is and what it has learned. This includes providing time to pause for review.

The facilitator works to establish a psychologically safe climate for intellectual exploration. When group members participate and extend themselves to the limits of what they know, they will experience a sense of vulnerability. This process will be inhibited if the right climate is not created. Many participants will have had previous experiences where expressions of ignorance were met with negative sanctions. Therefore, one of the most important ground rules to establish is that learners and their contributions will be respected and not maligned or denigrated.

The role a facilitator plays in a single group over time is likely to change. In the beginning, the facilitator may need to model the desired behavior. This will then evolve into coaching the members. Finally, as the group gains experience and self-confidence, the role of the facilitator will fade to permit the learners and the group as a whole to manage itself.

How problem-based learning works

The basic structure for problem-based learning sessions is straightforward. A group of learners gathers. The learning begins with a case scenario that needs to be solved. The facilitator describes the overall objectives and serves as a guide. A member of the group is given the role of scribe. The case scenario is read. The group generates three lists: the facts of the case, the hypotheses, and the learning issues.

For example, the following case scenario from **EPEC™ Module 4** might be proposed:

Hector Gonzalez is coming in for a return visit. He was diagnosed with colon cancer 18 months ago and had a bowel resection and adjuvant chemotherapy. He had been relatively well until he recently began to develop leg pain.

"Doctor, the pain in my leg is terrible. I don't like to complain, but I can't take this any more. I can't sleep and my family says I am very irritable."

A full case description remains in the background until the learners have dealt fully with hypotheses and have obtained further facts from the facilitator. Each case has its own specific objectives, which are not fully revealed until the end of the case. The role of the facilitator is to guide the learning process so the case reaches a suitable conclusion.

Hector Gonzalez full case description:

Chief complaint: Leg pain, insomnia, constipation, nausea

History of Present Illness: Hector Gonzalez is a 67 yo man who notes severe pain in his right leg. He describes the pain as "dull." Initially the pain was 3/10 and relieved with acetaminophen. When pain became worse it was again controlled with combination hydrocodone/acetaminophen (5mg/500 mg). Now he describes the pain as 8/10. The pain wakes him from sleep and he can't go back to sleep. In addition, he describes his appetite as poor. He prefers soup and "light stuff." He is also nauseated and constipated.

Past Medical History:

1. Adenocarcinoma of the colon. He initially sought medical attention for "weakness." Evaluation revealed occult blood in his stool and a microcytic anemia. Colonoscopy revealed adenocarcinoma of the transverse colon, Duke's stage C. He was treated with resection and adjuvant chemotherapy.
2. Modest obesity.
3. Type II diabetes.
4. Hypertension.

Social History: Auto mechanic. Married for 40 years; two children, Vivian and Hector.

Physical Exam: Well appearing. Doesn't appear to be in pain. Vital signs are normal. Lungs and heart are normal. No adenopathy is seen. Abdominal examination is limited by obesity. Bowel sounds are present. The liver edge is palpable. Rectal examination shows no masses and fecal occult blood testing is negative. He is tender on his right femur in the area where he reports pain.

Portions of the three lists that the group generates might look something like this:

Table 3: Examples of group-generated lists

Facts	Hypotheses	Learning issues
Focal leg pain Hx of colon cancer	Possible bone metastasis	Does colon cancer metastasize to bone? How does a metastasis cause pain? What tests are used to image bone? How is bone pain managed?

Teaching skills

Effective problem-based learning requires advance preparation. The facilitator will want to carefully choose problems, learning objectives, and an overall "track" in order to prevent the group from feeling aimless.

The group is convened using the concepts of group formation. Before the group can perform its tasks, it needs to form. All members are asked to introduce themselves and say something about their background, interests, and what brought them to the group. A group understanding and adoption of ground rules and learning objectives are developed. There may be some debate and "storming" as this understanding develops. It is expected; only when the group has "formed" and "stormed" can it get on to "performing."

The facilitator creates a nonthreatening environment both through the explicit setting of ground rules and the way in which he or she asks questions and expresses approval for the way the group is functioning. It is important to recognize and admit ignorance. The phrase "I don't know" is acceptable and preferable to bluffing or failing to participate. Speculation is encouraged, but it needs to be identified as such. Individual group members and their contributions must not be criticized.

Such ground rules apply as much to the facilitator as to the learners. The facilitator will want to be forthright about what he or she doesn't know.

Although group members will vary in regard to how much they want to talk, the facilitator works to involve all group members. Once initial trust is established, the facilitator will likely be able to involve others with comments and questions such as:

- "That's an interesting point of view. What do the rest of you think?"
- "Let's go around the table and describe what you make of this."
- "Martha, you look like you don't agree. Tell us what you are thinking."

The facilitator will need to question effectively in order to promote critical thinking. For example, many participants will offer an initial thought or comment but want to play it safe. The facilitator may want to prompt additional depth by following up with a question such as, "Can you say more about that?" The facilitator may want to prompt debate by saying, "How do others feel about what Mary said? Is there another way of looking at this?"

The facilitator needs to listen carefully both for content and also for process. The facilitator will want to positively reinforce the desired behaviors of thoughtful inquiry and debate and negatively reinforce grandstanding or preemptory comments that foreclose discussion and inquiry. The facilitator observes and identifies group behavior in order to facilitate the group work that is needed.

One way to think of the facilitator's role is to think of it as *guiding by questioning.* In choosing questions, the facilitator can target areas of controversy and explore differences. While the facilitator needs to keep an eye on time and focus, exploration of the limits of understanding is where the richest learning occurs.

The facilitator is likely to know more about the subject than the learners. However, the facilitator's role is not to provide all of the needed information, but to provide limited but relevant information that helps keep the group focused and on track. The facilitator will want to correct misinformation, but not give all of the answers.

At the conclusion of the session, or at key points in the work of the group, the facilitator will want to summarize and synthesize what the group has done and learned. He or she will help the group draw conclusions and identify learning gaps that have been closed, and others that remain. This provides the opportunity for the group to evaluate its work and identify additional learning issues. This process provides stimulus for further study. The group may want to delegate individual study and reporting responsibilities for the next group meeting. Group members may also evaluate the sources of information they used (such as faculty, the reference list, colleagues, Web sites, textbooks, journals, etc.).

Common pitfalls

There are several common pitfalls in facilitating problem-based learning.

One-on-one versus group discussions. Avoid being drawn into a diad while discussing a subject, or permitting two group members to do so. This is particularly easy to do when one individual has more background than the others or there are strong points of view. If

it carries on too long, other members of the group are relegated to passive observer roles rather than active participants. When this is recognized, interrupt with a comment like, "What do others think about this?"

Non-conducive physical environment. The setting in which problem-based learning is conducted is important. Ideally, it permits the participants to sit comfortably in close proximity to one another in a nonhierarchical fashion. Sitting around a table is an example. There should be enough comfortable seats, and extraneous noises and interruptions should be prevented. Simple tools and supplies such as white boards with dark-colored markers or flipcharts should be at hand. The room should have adequate lighting and be a comfortable temperature. In contrast, lecture halls with fixed, forward-facing seating or a large boardroom table that keeps participants at a distance should be avoided.

Psychological climate that discourages risk-taking. This complex and subtle characteristic is vital to the exercise. Risk can be implied in a variety of ways; for example, being observed and judged by someone in a position of authority. Facilitator comments that imply criticism or ranking, or pejorative comments made by group members outside of the group can also lead to a nonconducive learning environment.

Panic over content. Facilitators or participants may feel that they don't know enough, haven't prepared enough, haven't covered enough, or haven't performed well enough. While a little unease creates the tension for change, too much panic leads to the learning environment being shut down.

Panic over silence. Facilitators may be uncomfortable with the silences that frequently come when group members are reflecting or synthesizing material. Classically, the facilitator feels the silences are endless, while the participants don't notice the silence at all. Less frequently, a participant will be similarly uncomfortable.

An important pearl with which to finish is, when confronted with a problem, consult with the group about its solution. If you trust the group process, they will solve most problems for you.

Standardized patients

A longstanding feature of clinical education is the value of "learning by doing." Consequently, trainees in all disciplines and at all levels appreciate what is learned at the bedside.

A challenge has been that individual patients are notoriously variable. It is only after an aggregate number of individual encounters that a trainee can be expected to have had a broad enough base of experience upon which to practice.

From an educator's viewpoint, the challenge of learning at the bedside is that it is time consuming. Although a mentor-trainee pair at the bedside is powerful, the number of

trainees exceeds that of mentors. Combined with patient variability, this presents a barrier to ensuring a consistent level of education across all trainees.

One way of approaching this has been to use role-play. However, role-play is limited by the abilities and experiences of the individual participants. Another approach to combining the immediacy of the clinician-patient encounter with the need to provide consistent instruction is the standardized patient.

Simply put, a standardized patient is someone playing a defined role. The role is usually developed from a real patient. But, in contrast to real patients, the standardized patient can repeat the role with multiple different trainees. This provides a common clinical environment in which each trainee can learn new skills.

In addition to the consistent encounter, the standardized patient can also participate in assessing the trainee's performance and providing feedback.

Finding a patient

Many medical schools have developed standardized patient programs to teach and assess skills. Standardized patients are drawn from community members who are usually paid an hourly fee for their time. These people are frequently involved in community theater or acting schools. Some programs use patient or community volunteers.

Developing the patient

Begin with a case that has features of the clinical encounter you want to simulate. Write a description of the case and the motivation and background of the patient.

Based on your experience, describe how this patient will respond to likely encounters with the trainee. For example, the patient will not discuss her religious views of being punished by God unless the trainee first inquires about her spiritual concerns.

Then, write out the description of the case that will be given to the trainee. Include the objectives of the interaction and the timeframe that the trainee has to accomplish the task.

If this is to be evaluated, develop a checklist of the behaviors or skills you want the trainee to demonstrate. The standardized patient can then complete this checklist for each trainee.

Piloting the patient

Introduce the patient to the role and then pilot the patient with a few clinicians. They may be expert faculty or they may be a few trainees. Observe the interactions. Debrief the participants. Was it natural? Did it seem real? Were the responses plausible? Was the scenario believable? Was it too easy or too hard?

Now you are ready to use the patient.

Using standardized patients

Standardized patients are frequently used in one of two ways described below.

Group encounter

The trainees are asked to sit in a semicircle around the patient and one trainee. The trainee in the center begins the interview or physical examination. The rest of the trainees are observers. The trainee may call "time out" at any time to ask for help or advice in conducting the interview. During a time out the patient falls mute. The facilitator may also call time out if there are challenges or information to be presented. When the trainee wishes to resume the interaction, he or she says "time in." In general, the role of the facilitator is to help trainees discover what to do rather than tell them what to do. Trainees can rotate into the interviewer role midinterview, or the interview can be rolled back in time to an earlier point for subsequent trainees.

At the conclusion of the interview, the standardized patient can come out of role to give feedback to the trainees. The patient and trainees can then complete an evaluation.

Individual encounter

The patient may be in a consulting room or hospital room or other private environment. The trainee enters the room in role and conducts the encounter. At the conclusion, the patient comes out of role to give the trainee feedback. Each can complete an evaluation of performance.

The encounter can be videotaped and reviewed by the patient and trainee, by the trainee alone, or by the trainee and a faculty preceptor at a later date.

Individual encounters have been used as objective structured clinical examinations (OSCE's).

Summary

Each educational technique—lecture, small-group case-based, or role-play—has indications and contraindications depending upon the educational objectives of the session and the setting. With practice, the teacher will enjoy applying these techniques to achieve the maximum benefit for the effort.

Key take-home points

Depending upon the goals of the teacher, specific techniques can be selected, like tools from a toolbox, to better achieve the goals. Lectures efficiently cover a large amount of information, but it takes discussion to help learners integrate and apply the information. Skills require practice—you don't learn skills in a lecture or discussion.

Pearls

1. If you don't know the answer to a question, say, "That's an interesting question. I wonder if someone in the group has an opinion?"
2. Never ask if people want to do a role-play; just tell them they are going to do it.
3. Bite your tongue if you are facilitating a group—let them work on the material themselves.

Pitfalls

1. Bluffing if you don't know the answer to a question.
2. Making a group discussion into just another lecture.
3. Asking if participants want to do a role-play.

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