

# Advanced Learning and Training Handouts

Handout 1: Advanced Learning and Training description and outline

Handout 2: Importance of Writing Learning Outcomes

Handout 3: Bloom's Taxonomy and Writing Learning Outcomes

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Handout 1.

**Course description  
and outline**

## **Subject – Viral Genomics and Bioinformatics - Advanced Learning and Training Programme**

**Dear Participant,**

We are looking forward to seeing you on the course on Thursday. In preparation for this, we would like to provide you with information about the Advanced Learning and Training workshop which will run after the introductory sessions. **ALL participants are expected to attend the first session as it will initiate networking as part of the course programme.**

In your applications for the course you indicated (i) how attending this course would benefit your research, (ii) that the course will provide an opportunity to network with others and (iii) your intentions to disseminate, share or train others on the skills you learn during the course.

Therefore, as part of our personal professional development series, we bring you the Advanced Learning and Training programme (ALT), which includes a bite-size version of Train-the-trainer in the context of the course.

**The aim of the ALT programme is to provide you with tools** for development and application of good educational practice and to train or present to others when you return to your institutions. In the context of the course, ALT will introduce basic theory and exercises to enhance your learning practice during the week. An online toolkit will be used to guide you on self-reflection exercises, networking, planning individual objectives on how to use what you have learnt during the course for your own research and outline a plan to feedback or train others upon return to your home institutions. You will each receive a Google sheet link to your online ALT Toolkit for completing exercises from the ALT sessions.

**Key action:** You will need a Google account to access the ALT Toolkit. We will add the email address which you have provided on the course. However, if it is not a Google account, please make sure that you provide a Google-linked email address to enable you to access the documents. Please let us know if you have any problems.

## Advanced Learning and Training (ALT)

### Viral Genomics and Bioinformatics Virtual Course – Asia

22–26 August 2022

#### Who is this course for?

**Audience:** All participants; *Training team who are interested in sharing their experiences.*

This course is designed for participants who would like to develop their learning, training and presentation skills in the context of *the Viral Genomics and Bioinformatics course*

You will have already developed a high level of expertise in your field, and you may have some experience of training, group work and presentations. However, you now want to develop your educational practice and learn how to train others upon return to your institution.

#### What does the course cover?

This 3-part course covers the development of skills, knowledge, and confidence which will enhance your learning experience on the course; and help to prepare you to deliver training and presentations to small or large groups using the course materials on return to your institution.

**Session 1 (1.5 hours)** focuses on good educational practice, reflection on learners' experiences, roles and responsibilities, communication skills (asking and responding to questions), group work (ground rules, dynamics, and participation), and action planning - in the context of the course.

At any point, point you can reach out to Trainers and other participants to review their practice and their action plans. Throughout the week you will be reminded to reflect on each day's outcomes and continue to think about your key areas of interest which need continued development and support.

**Session 2 (1 hour)** focuses on reviewing your progress and planning for further professional development; and prepares you to deliver training and presentations to small or large groups using the course materials on return to your institution.

**Session 3 (1.5 hour)** will be held 2-3 months post-course as a networking event to discuss how you have shared what you have learnt, further action-planning and exploring mentorship opportunities.

#### Learning Outcomes

**At the end of the program, the participants will be able to:**

- o explain good educational practice
- o differentiate learners and trainers' roles and responsibilities,
- o identify and use different questioning and response techniques
- o explain and use effective group-work skills
- o select and use effective training techniques to share elements of the course with others
- o use action planning and review processes to support their professional development

## Training Details

**Audience:** Participants, instructors and assistants

### Day One Training Session (1.5 hours) – Introduction Day

Welcome, learning and teaching skills development, and action planning for professional development during the course.

#### 1. Course Welcome and Overview (5 minutes)

- o Course context, Aims, Learning Objectives and Learning Outcomes
- o Session 1 outline – Advanced Learning and Training

#### 2. Introductions (10 minutes)

- o Ice breaker (ALL)
  - o Breakout rooms in pairs
  - o Mentimeter task
- o Learning contract and rules
  - o Mentimeter task

#### 3. Advanced Skills Development (1 hour)

- o Part 1: Learning, Teaching and Training (30 minutes)
  - Learning and teaching experiences - 5 minutes
    - Task – share experiences
    - Breakout rooms in pairs
    - Mentimeter task
  - Social learning pedagogy - 4 minutes
    - Andragogy – adult learning
    - Social learning strategies
    - Mentimeter task
  - Roles and responsibilities - 1 minute
  - Learning and teaching theory and application - 15 minutes
    - Writing learning outcomes
    - Bloom's taxonomy
      - o Handouts (i) Blooms taxonomy (ii) Writing learning outcomes
    - Task - Viral Genomics course context
    - Breakout rooms
- o Part 2: Communicating and Presenting (5 minutes)
- o Part 3: Asking and Responding to Questions (10 minutes)
  - Reflection and practice: Why, who, what, when, and how
  - Questioning: Asking, listening, responding, facilitating, motivating
    - Mentimeter activity
    - Handout (i) Asking and responding to questions - read in own time
  - Asking questions – action planning
- o Part 4: Group Work (Total time for this section: 15 Minutes)

- Groupwork dynamics, ground rules, context, participation and inclusion
  - Important groupwork skills and behaviours
  - **Individual task** - reflection exercise
    - *Handout (i) Groupwork skills*
    - **Mentimeter task**
  - **Group Task:** Explore and share: Current research/work challenges and opportunities, course aims
    - **Breakout rooms (5 minutes)**
    - **1 minute presentation per group (5 minutes)**
- 4. Action Planning and Professional Development (15 minutes)**
- o ALT Toolkit demo instructions
  - o Course action plan
  - o **Individual task** - Identify and set three key actions for the week
    - o In ALT Toolkit

## Session End

## Day Two Training Session (1 hour) – Thursday

Course Review, Designing and Presenting Courses, and Action planning

1. **Welcome, Introductions, Session Aims** (5 mins)
2. **Review progress** (15 mins)
  - o Reflection on progress - key actions – individual objectives set at start of week (Google worksheet) – Ask a few participants to share
  - o Consider own learning during the course and its application in current research
3. **Designing and Presenting Elements of the Course and Materials: Skills Development** (30 mins)
  - o Goal, Target audience, Content, Learning outcomes, Activities, Delivery – go through guidance (5 minutes)
  - o Complete in Google worksheet (15 minutes)
  - o Pairs task – Participants share their plans with each other, also discuss opportunities and challenges for sharing elements of this course in own home context (5 minutes).
  - o Participant feedback on plans (5 minutes).
4. **Wrap-up – Action planning and Professional Development** (15 mins)
  - o Reflect and set action plans post-course
    - o Application of knowledge and skills
    - o Training others
    - o Discussion on what networks and collaboration opportunities

## Session End

## ALT Toolkit

*During the week (after Session 1) participants should work on their individual ALT Toolkit. All were provided with a Google sheet link and contains a worksheet for noting down individual objectives, networks and collaboration opportunities and planning template. Some you may already be thinking of what components from this course which you might want to go back and present, teach or demonstrate. It could be a talk about importance of NGS technologies and how some analyses they can be integrated into your work/research/institutes. Could be a small module which you wish to present within an existing course in your university, a demonstration of specific analytical steps for a small group of students or labmates. Think of something feasible which you think you could start with. Quick overview think what, how, to whom and when. Below are some pointers on what to think about and enter in ALT Toolkit planning template worksheet. You will also be given about 15 minutes during Session 2 to complete this template*

*Work in your Google worksheet and add in bullet points (guidance included for each section).*

- o If it's a training or if it's just a presentation which you wish to give, start with the topic, target audience and bullet points on what you want the audience to learn or what you hope to achieve in the end.*
- o Write down the title of the training, course, or module which you like to run or present.*
- o Who will your target audience will be.*
- o Then come up with the learning outcomes list 3-5 maximum*
- o With LO's you can then come up types of exercises you might want to do*
- o What software would be needed, what other resources would be needed and for how many people?*
- o Location/venue, how many people you would teach or present to.*
- o Remember how to write Learning outcomes (in your ALT handouts) and use of Bloom's taxonomy.*



Handout 2.  
**Importance of  
Writing Learning  
Outcomes**

## **Importance and Benefits of Learning Outcomes**

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**Abstract:** In Asian countries there was a time when students used to study and their teachers & parents used to guide them. However, there has been a shift, the 21<sup>st</sup> century students have become independent learners. They understand what they want. They choose the courses of their choice. Learning outcomes of a course or programme clearly show what the student is going to achieve at the end of the course or programme. This article presents the importance of learning outcomes of a course/programme, how they are formally specified / written and why students should read and understand the learning outcomes (LOs) before they chose a course or programme.

**Key words:** *Course, programme, leaning outcomes, measurable, achievable, assessment.*

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### **I. INTRODUCTION**

An academic course or a programme is developed successfully based on the clear idea of what can be achieved at the end of the course / programme. And the programme can be launched only if its learning outcomes are clearly specified and communicated in writing. In Europe it is very common to write learning outcomes to define any courses. According to Gosling and Moon (2001) outcomes-based approach to teaching is becoming more and more popular at an international level. This approach has been progressively adopted within credit framework and by national quality and qualifications authorities such as the QAA (Quality Assurance Agency for Higher Education) in the UK, the Australian, New Zealand and South African Qualification Authorities (Gosling and Moon).

### **II. WHAT ARE LEARNING OUTCOMES**

Learning outcomes are like navigation tool, such as GPS. Once destination is fed to GPS the device guides the driver throughout the journey and takes the driver to the mentioned destination correctly without fear of losing the way. Even if the driver takes a wrong route, the GPS guides the driver and helps to join the route which leads to the intended destination. Similarly learning outcomes are guiding tools which guide the students to the desired results of the planned course. They also show and help the teachers the path to be followed and make the students aware what they will be able to achieve at the end of the course. Also they help the teachers and the students know the route to be followed.

### **III. DEFINITION**

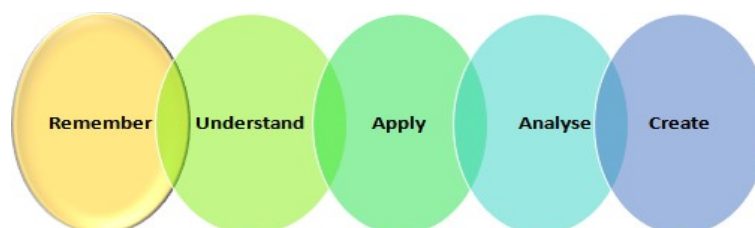
Learning outcomes are written statements of what the successful student/learner is expected to be able to chieve at the end of the programme module/course unit or qualification (Adam, 2004). Learning outcomes are tatements of what a learner is expected to know, understand and/or be able to demonstrate after completion of a process of learning (ECTS Users' Guide, 2005).

### **IV. HOW TO WRITE LEARNING OUTCOMES**

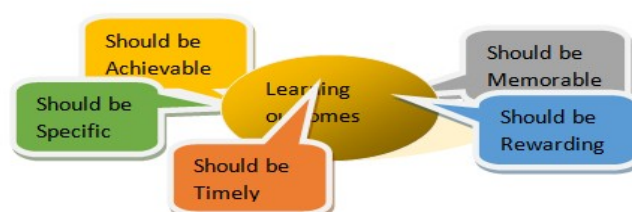
Learning outcomes need to be specific and measurable. Learning outcomes are generally written based on Bloom's Taxonomy. Bloom's Taxonomy explains the process of learning and hence has proved to be a powerful tool to help develop learning outcomes. The concept in Bloom's taxonomy is very simple.

- Before understanding the concept, remembering it well,
- Understand it before you apply it,
- Analyse the process before you evaluate it.

## Concept in Writing Learning outcomes



## Points to consider while preparing learning outcomes



Learning outcomes should be based on the following factors:

- Knowledge - Knowledge about the subject, familiarity, awareness or understanding of the subject, such as facts, information, descriptions, or skills, which is acquired through experience or education by discovering or learning. The commonly used words are list, recognize, define etc.
- Cognitive – Intellectual skills, should include how to apply knowledge to actions, should include problem solving skills. The commonly used words are describe, explain, identify etc.
- Practical – How to design and carry out experiments? The commonly used words are demonstrate, implement etc.
- Generic Skills - Generic skills include problem solving techniques, keys to learning. The commonly used words are analyse, compare etc.

## V. IMPORTANCE OF LEARNING OUTCOMES

Learning outcomes are indicators of success of an academic course/programme. Learning outcomes give a clear idea of what can be achieved by joining a particular programme. Whether it's a short course or a degree programme, the learning outcomes should be listed and written down before the start of the course to know and to check whether the course is designed and conducted perfectly. Based on the identified learning outcomes, teaching context, learning activities and assessment scheme have to be properly designed to successfully conduct and complete the course / programme.

## VI. BENEFITS OF LEARNING OUTCOMES

6.1 Students clearly understand beforehand what they are going to learn from the course/programme.

- ✓ Learning outcomes help the student choose appropriate course/programme.
- ✓ Well defined learning outcomes remove the risk wasting time.
- ✓ Reduce unnecessary stress on the students.
- ✓ Learning outcomes gives a clear idea to the students of what are they going to learn or achieve at the end of the class before the start of every class.
- ✓ Learning outcomes highlights what exactly and more importantly students should know to achieve from that particular course.
- ✓ By achieving Learning outcomes students can demonstrate that he/she has reached the summit of the course.

6.2 Benefiting Teachers find it easy to plan a lesson

- ✓ Learning outcomes help teachers plan a lesson
- ✓ Learning outcomes give a clear idea of what and how much to teach and plan accordingly.
- ✓ Learning outcomes help teachers design their teaching material more effectively.

- ✓ Learning outcomes help teachers select appropriate strategies for teaching.
- ✓ Learning outcomes help teachers avoid extra teaching which ultimately help in saving time.

#### 6.3 Help in writing Assessments & Evaluation

- ✓ Learning outcomes make Assessments mapping clear & easy.
  - ✓ Learning outcomes make midway corrections possible.
  - ✓ Learning outcomes make students study on their own and come to the class well prepared.
- Evaluation
- ✓ Learning outcomes help in measuring the effectiveness of the unit.
  - ✓ Learning outcomes play a major role in allocation of marks while setting question papers.

#### 6.4 Help Academic Advisors and Advisees

- ✓ Learning outcomes help advisors to focus on the questions on WHAT students should be learning and HOW they are going to teach this.

#### 6.5 Help in securing Accreditation

- ✓ Learning outcomes help Accreditation agencies to assess whether the course / programme has met the mission and goals of the Institution.
- ✓ Learning outcomes help to know how the course or programme has been structured and different processes for evaluating the students' learning.
- ✓ Learning outcomes work as a kind of evidences e.g. rubric, charts or graphs related to summative learning goals.
- ✓ Learning outcomes help the Accreditation Agencies in ascertaining whether the desired objectives are met.

#### REFERENCES

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Handout 3.

**Blooms**

**Taxonomy and**

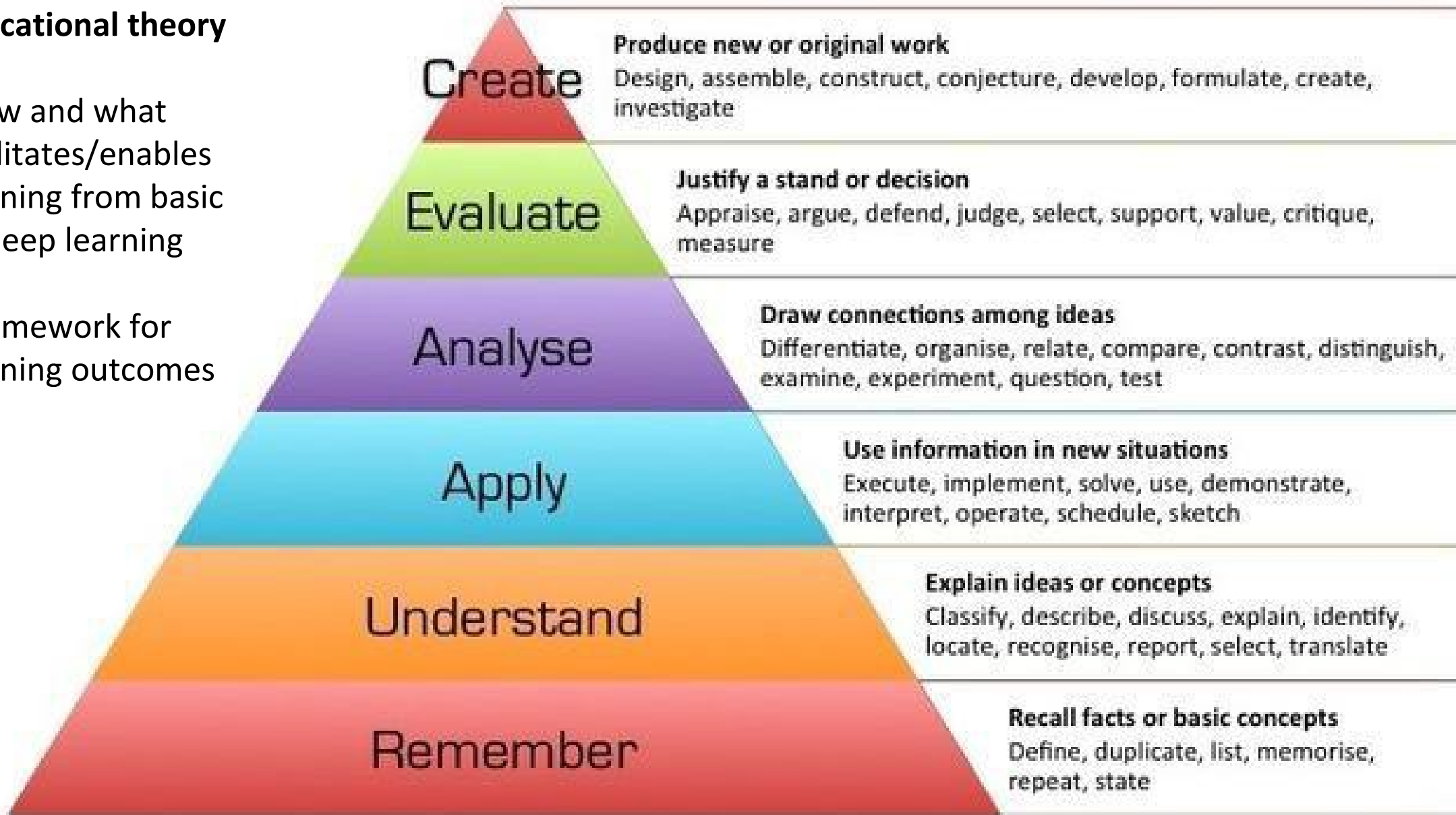
**Writing Learning**

**Outcomes**

## Educational theory

-How and what facilitates/enables learning from basic to deep learning

-Framework for learning outcomes



# Learning, Teaching, and Training Theory: Development (1)

## **REMEMBER:** Recall facts or basic concepts

Define, duplicate, list, memorise, repeat, state

## **UNDERSTAND:** Explain ideas and concepts

Classify, describe, discuss, explain, identify, locate, recognise, report, select, translate

## **APPLY:** Use information in new situations

Execute, implement, solve, use, demonstrate, interpret, solve, sketch

# Learning and Training Theory: Development (2)

## **ANALYSE:** Draw connections among ideas

Differentiate, organise, relate, compare, contrast, distinguish, examine, experiment, question, test

## **EVALUATE:** Justify or stand for a decision

Appraise, argue, defend, judge, select, support, value, critique, measure

## **CREATE:** Produce new or original work

Design, assemble, construct, conjecture, develop, formulate



## Learning Outcomes

Learning Outcomes (LOs) describe what course participants should be able to do or demonstrate – in terms of particular knowledge, skills, and attitudes – by the end of the course.

For example:

*By the end of this programme/ course participants will be able to:*

- *Describe and critically evaluate a range of up-to-date genomic technologies and platforms used to sequence targeted parts of the genome or whole genomes*
- *Discuss and critically appraise approaches to the bioinformatics analysis and interpretation of genomic data*

## Identifying Learning Outcomes

When identifying LOs consider what knowledge, understanding and skills you intend participants to learn through the course. The following questions may help with this:

- What do you want participants to know and be able to do by the end of the course?
- How will participants be able to use their learning? Doing what? What contexts?
- What will participants need to do in order to demonstrate if / how well they have achieved these outcomes?
- If participants are asked ‘*what did you learn during this course?*’ how would you like them to answer?

## Writing learning outcomes

It is helpful to express LOs using an active verb (what participants will be able to do) + object + qualifying phrase to provide a context.

**Table 1: Writing LOs**

<b>Active Verb</b>	<b>Object</b>	<b>Qualifying phrase</b>
<i>critically evaluate</i>	<i>a range of up-to-date genomic technologies and platforms</i>	<i>used to sequence targeted parts of the genome or whole genomes</i>
<i>synthesise</i>	<i>information gained from whole genome analysis with patient information</i>	<i>to determine diagnosis, penetrance or prognosis for a number of common and rare diseases</i>

Avoid use of verbs such as ‘understand’ or ‘appreciate’ or ‘be familiar with’ instead ask yourself what the course participants will be able to do if they understand ‘x’ and try to express this in the learning outcome. The approach does not diminish the significance of knowledge and understanding in favour of mere task performance, but acknowledges that the possession of knowledge or understanding is beyond direct observation. An inference based on evidence presented by way of some particular action is therefore required: it is this action which an LO must seek to communicate.

Table 2 is based on Bloom’s Taxonomy of cognitive learning and provides ways of describing outcomes at different levels of knowing and understanding. The taxonomy provides a potential vocabulary for articulating different kinds and level of outcome.

Table 2: Active verbs based on Bloom's Taxonomy of Cognitive Learning (1956)

Class	Description of class	Cue words
Knowledge	Terminology, facts, conventions, trends & sequences Classifications, criteria, methodology Theories, principles	Write State Recall Recognize Select Reproduce List
Comprehension	The ability to translate, interpret and extrapolate knowledge.	Identify Illustrate Represent Formulate Explain Contrast Paraphrase Summarize
Application	The use of theories, principles and ideas in particular and concrete situations.	Predict Select Assess Find Show Use Construct Compute Solve
Analysis	The ability to identify relationships, omissions, parts, organizational structure, unstated assumptions To distinguish fact from opinion, conclusions from evidence Recognize relevancy for the validation of a judgement Detect errors in logic. Distinguish cause and effect.	Select Compare Separate Differentiate Contrast Break down Classify
Synthesis	Put material together to form a new whole Production of unique communication, plan or hypothesis	Summarize Argue Relate Précis Organize Generalize Conclude Design
Evaluation	Quantitative and qualitative judgements about the extent to which material and methods satisfy criteria Comparison of major theories. Evaluation of accuracy of communication using evidence such as consistency or logic.	Judge Evaluate Support Conclude Avoid Select Recognize Criticize.

Note:

If your course has a professional orientation/ accreditation, you will need to provide details and refer to any relevant professional, statutory and regulatory bodies.

Handout 4.

# **Asking and Responding to Questions**

## ASKING AND RESPONDING TO QUESTIONS

### Part1: Tips for Asking Questions

These excerpts explain how to ask effective questions --- an essential skill for all researchers.

Why is asking questions so important for a researcher? Asking questions is an essential aspect of being a researcher. All research is based upon questions and is driven by questions. However, to be able to refine and articulate questions, experience is necessary. For many young researchers, coming up with meaningful questions is a big challenge.

A key is the way you listen to talks: do not simply absorb information, but continuously compare the information being presented with what you know (including what the presenter has told you so far), and try to make connections between them. Once you develop this habit, you will find that questions begin to come up automatically. Such "active listeners" can understand and acquire much more knowledge from a presentation than passive listeners.

Asking questions requires a certain amount of courage. It is natural to hesitate or shy away from asking questions in public. In the book "At the Bench: A Laboratory Navigator" (2005, Cold Spring Harbor Laboratory Press), Kathy Barker describes the following reasons why many people are reluctant to ask questions.

- 1) My question won't interest anyone else, so I'll ask the speaker after the seminar.
- 2) I won't be able to express my question, it is too complicated.
- 3) I'm probably supposed to know the answer, it is my field.
- 4) It is too obvious a question. Everyone else knows the answer.
- 5) I don't want to look stupid or unread.
- 6) I don't want to have a confrontation in public
- 7) I must have missed the slide that would explain. I can't let on that I wasn't paying attention.

While you may empathize with these excuses, they are of no benefit to anyone.

**"Forget about your hang-ups and just ask questions!"**

**Aim to ask at least one question at each session you attend. The more questions you ask, the better you will be at asking questions.** Perhaps more importantly, by asking a question you will gain not only the information you requested, but also the ability to think critically.

Here is an advice for those who think they cannot come up with a good question: think about the following issues while listening to a talk. You will find questions arise.

1. What is the key question of this research?
2. Predict what will come next; what kind of discussion, experiment, data, slide, etc. will follow?
3. Think about the data you are given and try to develop your own conclusions. Then compare them to the presenter's conclusions. Are they the same? If not, then why?
4. What is the most important data in this research? Is it solid? (Are there any holes in it?)
5. Do the experimental results/ analyses have a direct and meaningful connection with the key question?
6. Can you think of any other ways to interpret or explain the data and experimental results?
7. Is there some important point no one seems to be picking up on or some missing explanations or data you feel are necessary?

8. Do any of the data or conclusions contradict each other?
9. Do the presenter's results or interpretations contradict what you know to be fact?
10. Recall what the presenter provided as the perspective frame in the introduction.
11. Is there any common ground between this research and your own personal interests or work?
12. Can you find any interesting point in any data to which the presenter seemed to pay little attention?
13. If you were doing this study, what would be your plans for continued or future research?

Questions can be classified into several types, and the following questions are those most frequently encountered at the Q&A session of scientific presentations. Examples of each question type are also included; feel free to adopt them for your own use.

**A) To request detailed explanations for contents you didn't understand or would like to hear further explanation about:**

- I could not follow how you reached that conclusion. Could you elaborate on that?
- Perhaps I have missed something from your talk. Would you please explain how you found...?
- I am not familiar with this field and would like to ask why you can assume...?
- Could you tell me a little more about...? I am not quite sure why the mutation caused....
- You mentioned.... How did you find it?

**B) To ask about the results of experiments that you suspect they may have performed:**

- Did you do the same experiment using a different material?
- When that phenomenon happens, how long does it last?
- Did you find any difference in appearance between the two groups?
- Were there any exceptions that did not follow the rule?

**C) To ask about previously known facts and information in order to inquire about any connection with other research:**

- Is the rate constant calculated in your study similar to the estimate in previous studies?
- Is the .... the only known region associated with.... ?
- If I remember correctly, .....can develop without ..... How are these results related to yours?
- Do you know. ? There might be some preceding study that examined that.
- Are there any other methods that you can use to test .. ?

**D) To challenge the presenter's interpretations or to suggest other possibilities:**

- Other than.. , is there any other proof of your conclusion?
- I am wondering how you can be so sure that.... Could you explain the reasons to me?
- You mentioned that other conditions did not change the results. Could it be because ...?
- There seem to be other possible explanations for the results. Do you have an alternative hypothesis?

**E) To ask for opinions or interpretations about results – especially if some unusual results were left uninterpreted:**

- I noticed some low outliers in your results. What does that mean?
- There are thousands of different species. Do you have any idea how they have evolved?
- In your data ..... Is that difference significant? If so, how do you explain the difference?

**F) To pose hypothetical questions about experiments the presenter is not likely to have tried:**

- If there were the same mutation in ....., what symptoms would you expect to develop?
- What do you think would happen if you did...?
- If you could reverse the conditions, what would you predict the results to be?
- Is it possible for you to test the causal relationship more directly?

**G) To suggest a new direction for the presenter's research:**

- Do you think it's possible that...?
- Have you considered investigating...?
- Researchers in .... have been eagerly looking for a ..... technique. I think your ..... might open some possibilities for that.

**H) To ask about something not directly tied to the main point of the results:**

- This is probably not your focus, but I am interested in....
- Well, this is just out of curiosity, but ..?
- Would you tell me more about the techniques that .... I am wondering if I could use the same techniques in my research about....

When asking a question, it is important to first specify the theme of your question. When a presentation contains multiple topics, it is particularly important to start your question by specifying the topic that your question will be addressing. The following expressions can be used to restrict the topic: "You mentioned ...", "You showed...", "I have a question about...", "About the first part of your talk...", etc.

**Specific questions are easier to answer than vague, unfocused ones.** Presenters will likely be confused with questions such as "How do you feel?" or "What do you think about this?", and won't know how to answer. Even when you are simply asking for an opinion (rather than a specific answer), restrict the topic using expressions such as "Do you have any idea why this happens?" "Please interpret your unexpected results for us," "How can you explain the conflicting data?", etc.

## Part 2: Tips for Answering Questions

This section examines how to answer questions. While you can prepare and practice your presentation ahead of time, a perfect preparation is not possible for Q&A, in which the kind of questions you will receive is unpredictable. However, Q&A is an integral part of scientific presentations. Practice will help you to confidently handle any questions from the audience.

Make a habit of thinking about potential questions; this is the best preparation for the Q&A session. Many people ask questions without seeking specific answers (see Part 1). Obviously, you cannot provide a definite answer to questions on future directions or hypothetical questions, and you need not be embarrassed about saying “We don’t know yet” or “That’s a challenge for the future”. You need to realize, however, that the audience is interested in how you respond to such questions. Even if you don’t have any scientific results or data to present, a simple “I don’t know” is not a satisfying response. You may start your answer by “I don’t know yet”, but follow it up by adding more information: “I am expecting ... result”, “We are planning ...experiment”, “In future we would like to try...”. You can exploit this opportunity to introduce your own opinions, your vision and your dream; this is the key to upgrade your answer to an “effective response”.

The following provides advice for successfully answering questions.

### 1) When you don’t understand a question – confirm it!

If you are not confident that you have fully grasped the question, do not hesitate to confirm it before offering an answer. State clearly that you didn’t understand the question and ask for them to repeat it. For example, you could use the following expressions:

- I am not sure I understand your question. Could you please rephrase your question?
- I am afraid I didn’t quite catch what you’re asking.

When you have some idea about what the questioner is asking but are still unsure, do check back with the questioner by rephrasing the question in your own words (paraphrasing) and confirm it with the questioner. This is much more effective than having the questioner repeat the question in exactly the same way or in another similarly confusing rewording. You can try using something like this:

- You are asking about [paraphrase]?
- You’d like to know [paraphrase]?

### 2) When you need time to answer a question – ask for it.

When you receive an unexpected question that requires some time to compose a response, give an indication that you have understood the question but need a moment to think about the answer --- rather than going directly into silent deliberation. If you just go silent, the audience has no idea how to interpret your silence. They may assume that you have not understood the question, and the questioner is likely to begin rewording and repeating the question. You can use one of the following expressions to buy yourself a little time and set the audience at ease:

- That’s a really difficult question to answer. Let me think about that for a second.
- I hadn’t actually thought of that before. I’m going to need a minute to think about that.

### 3) When you feel that the audience may not understand a question – give them some background.

During the Q&A session someone in a field closely related to the presenter may raise a very specific issue that is unfamiliar to most of the audience. What is likely to follow is an intense dialogue between the questioner and the presenter leaving the rest of the audience in the dark. While such a discussion is a part

of the objective of giving a presentation, you must remember that the Q&A is for the entire audience, and respond in such a way that everyone can benefit from your answer. If you receive a very technical question that is unlikely to be understood by the most of the audience, restate the question in simpler terms and add background information to aid the audience's comprehension.

#### **4) Give a short, direct answer before going into detailed explanations.**

Because you have to compose your answer on the spot, often people end up giving a long-winded and seemingly rambling response, or the story shifts during the answer. To avoid such mishaps, provide a short, direct answer at the beginning, and then follow it up with a more detailed explanation.

For "yes/no" questions, you can start off with something like this:

- Yes, it is possible.
- That's right.
- No, unfortunately that is not known.

After such short, "straight" answers, you can go on to provide the detailed reasons and explanations. Often questions cannot be answered with a simple "yes" or "no". For example, the majority of the data indicate a "yes" answer, while some aren't solid yet, so a conclusive "yes" can't be given until further experiments are carried out. In such cases you can open your response by the following expression:

- The short answer to your question is "yes".

This expression will raise an "expectation" that a "but clause" will follow and you will be explaining why the answer isn't a simple "yes". By creating expectations and fulfilling them you can guide the audience through your ongoing story.

There are also many questions that cannot be answered by a yes or no. In such cases you can use the following expressions:

- I cannot provide a simple answer to your question.
- Well, yes and no.

Although these expressions don't seem to contain a lot of useful information, they act as an important signal and establish a clear framework of the full response. The audience will learn from the outset that the situation is not simple, and will be prepared to hear the complicated story that follows.

#### **5) When you don't know the answer – be honest and say you don't know!**

"I don't know" is not necessarily an embarrassing answer to a question; many questions are made without expecting direct answers anyway. After indicating that you have understood the motivation behind the question, candidly tell the audience that you don't have an answer. Whenever possible explain the reason you are unable to answer:

- That's a good question, but at this point we don't have enough data to conclusively answer that.
- That's a big question. As far as I know, nobody has answered it yet.
- I wish I knew the answer, but a major obstacle to answering that is .....

#### **6) Don't miss a chance to introduce your opinion!**

Sometimes people ask questions that there is no way of providing a direct answer, e.g. results of research that take years to perform or require techniques that are not yet invented. The reason why people ask such questions is because they would like to know the presenter's view. If such a question is raised, don't miss the chance of sharing your thoughts and opinions with the audience. You can introduce



ideas that are too speculative or preliminary to be included in the talk proper. After explaining that you cannot offer a direct answer, provide them with your opinion using expressions like the following:

- If I had to offer an educated guess, I would say that.....
- I don't have any experimental data to support, so this is just my opinion...
- The most likely possibility in my mind is ....
- Among many potential scenarios, my favourite is .....

### **7) Acknowledging good questions**

The following expressions are useful to show your appreciation of questions:

- That's a really good question.
- That's exactly what I would like to know next.
- I hadn't thought about the possibility, but thank you, that seems very important.

### **8) If you have any additional information to support your claims – provide it.**

Many questions are intended to challenge the conclusions and interpretations proposed by the presenter. Pointing out logical gaps or suggesting alternative interpretations falls into this category. Such questions may at times seem unnecessary but the questioner wants to know more about your new conclusions or ideas. This means that you don't have to limit your answer to the point that has been asked directly by the questioner; any additional results that support your claim can be a valid response to the question. This can include your own preliminary results, results of related work by others, or seemingly unrelated information that requires a mind of a genius (i.e. you) to find a connection to your work. Below are examples of expressions that can be used to introduce the supportive information; this signposting tells the audience the nature of the information that will follow:

- These ideas are also supported by data from a study by....
- We actually did another experiment to test..., and got preliminary results showing that....
- Actually, other groups show similar results using different materials....
- There is another line of evidence from clinical studies....

An additional advice for presenting supportive information: If you have a piece of information that is determining your way of thinking, present it at an early phase of your response. If this information were solid results, obviously you would have included it in the main talk. You must have held onto it because it is a speculative idea, or is too preliminary to talk about. However preliminary, you should tell the audience about it if that element is driving you to a particular model or a future direction. Without these details, the audience cannot fully understand your reasoning.

### **9) If the questioner misunderstood or failed to catch some information – offer a second explanation.**

If the questioner has misunderstood something or failed to recognize some data from your presentation, then there's a good possibility that some others in the audience may have missed the data or have misunderstood as well. If some data was misread or not noticed, you can simply return to that slide and show the data again. Otherwise, it's likely that something about your explanation was difficult to understand. Carefully explain the necessary information again.

Try an expression like one of the following:

- Let me explain that again.
- Let me show the data once again. Although it may appear insignificant at first glance, these results actually indicate that....

**10) When discussing a hypothetical situation, make sure the audience realize that it is hypothetical!**

When responding to questions it is quite common to discuss hypothetical situations or hypothetical results. A frequent problem encountered by the audience is that they cannot tell whether the situation is hypothetical or real. Use signposts to make this distinction very clear.

- If we used .....in our....., I would predict that .....
- One potential outcome is that.....

**11) When you do not want to answer a question during the Q&A – explain why and offer to provide the answer later.**

Sometimes you may receive questions that are not appropriate for the Q&A session for the entire audience. Questions on specific technical points, detailed methods, or those that require some time to prepare an answer are examples of such questions. In such situations, you should tell the audience that you would like to respond to the question personally at a later time:

- I think that question deserves a very detailed answer. Please do come to discuss your question with me after the presentation?
- I don't have the information I need to answer that right now, but if you give me your contact information after this session, I'd be happy to send it to you.

**Ask questions like a Pro:** Scientific seminars follow ancient routines. The speaker speaks for his allocated time plus a generous 15% bonus and then the big-shots in the first row ask a few questions. But have you ever noticed that they always ask the same questions? It's called experience i.e. they made up their question some 20 years ago.

*Details adapted from translation of a Japanese textbook by Tatsumi Hirata, Todd Gorman and Yash Hiromi ISBN 978-4-907623-17-3.*

Handout 5.

**Group Work  
Skills**

### When I am working in a group, do I...

- Listen attentively when other group members are talking
- Try to contribute in group tasks and discussion
- Allow space for others to join in
- Try to draw quieter or more shy group members into the discussion
- Allow for other opinions even if I don't agree with them
- Challenge or question ideas but respect the person
- Value and reinforce other people's contributions e.g. 'That's an interesting idea' or 'I hadn't thought of that'
- Seek clarification when necessary e.g. 'Do you mean that...?' or 'Could you say a little more about...?' or 'Could you give an example...?'
- Ask questions when I don't understand something
- Try to build on others' contributions e.g. 'Yes and what about...'
- Focus on the topic and try to keep on-task
- Show interest and enthusiasm

### And on the other hand, do I ever...?

- Interrupt when someone else is speaking
- Get bored if I'm not the centre of attention
- Lose patience if I get the answer sooner, or think I have a better answer than others
- Communicate reluctance to participate
- Take a back seat and leave others to do the work
- Start reading or working on my own
- Monopolise the discussion
- Wander off the point with irrelevancies
- Dismiss other people's ideas or 'put them down'
- Disturb moments of silent reflection by jumping in with comments

## Group Behaviours

### Behaviour that promotes group work on task...

- Making suggestions
- Requesting clarification
- Offering clarification
- Giving information
- Giving opinions
- Asking for information
- Asking for opinions
- Suggesting ideas
- Building on others' ideas

### Behaviour that assists group members to feel valued and included and promotes participation...

- Noting who will take a necessary action
- Supporting or agreeing with others
- Compromising, realigning own position
- Smoothing conflicts
- Inviting others to comment

### Behaviour that satisfies individual needs, at the cost of work on task...

- Defending own position
- Attacking others
- Distracting others by jokes and 'red herrings' / irrelevancies
- Two or more people talking simultaneously
- Withdrawal from the group or task
- Blocking proposals



# Handout 6.

## **ALT Toolkit**

- **Individual objectives for the week**
- **My network**
- **Planning template**

**Action planning for the week - individual objectives**

Introductions	Individual objectives of the week (list 3-5)
<i>Your name and Institution</i>	
	•
	•
	•
	•
	•
	•

Add / remove rows as necessary



## My network and collaborations

My Network	Enter names and institutions of people you met on this course	Potential collaboration on:
<p><i>On this course, I have met..</i></p>		
	•	
	•	
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Add / remove rows as necessary

Add / remove rows as necessary

**ALT Planning template**

Item	Guidelines	Notes (add information here - short, bullet points)
Module/ Session/ Training/ Presentation Title	Working Title for the Session, Training, for example: Presentation title, Talk, Lab or institutional feedback, Training Presentation, Discussion, Workshop title, Hands-On Session title, Module, Event or other	
Goals/aims	Background and justification. Include main aim or goal. This could be based hypothetically on addressing a training gap in an existing course, or need to analyse sequences generated in your lab or from collaborators. (e.g. why and who needs this training, what is the big gap or questions will this training fulfill, why is it important, why is it relevant)	
Target audience	Target audience. Who is this event or training aimed at? Please explain who your target audience is, and state if your audience/learners need any prior experience or qualifications. What are the pre-requisites? What is the expected number of people you will train/present to	
Content	What does it include: concepts and content? Please provide 4-6 bullet points outlining what the training/session/presentation will cover (training objectives).	
Learning outcomes	What are the Learning Outcomes for this event or training? Please explain in 3-5 bullet points what learners should be able to demonstrate in terms of particular knowledge, skills and attitudes after the course. (Refer to Blooms and Writing LO's handout). At the end of this workshop, participants will be able to:	
Activities	What activities or exercises, and instructional strategies will you use to deliver the various aspects of the training/session/presentation?	
	What training resources, software, online tools, other resources e.g. references, handouts, links, datasets, servers?	
Delivery of training/ session/presentation	Who will deliver the training? Why are you or they, the best to deliver the training? Please describe the unique skills and expertise required and why? How many trainers/assistants will be involved? Indicate if you will work with others to deliver the training or presentation	
	Where and when will the training take place?	
Potential challenges	Potential constraints, limitations in home context and possible ways to address/overcome these.	
Additional information, thoughts or ideas	Additional notes	