

Learning objectives for authors

To assist readers, your article should contain learning objectives. The objectives should be contained in phrases that state both the cognitive process and the type of knowledge.

Cognitive process

There are six types of cognitive processes, that is to say, remember, understand, apply, analyse, evaluate and create. When writing a learning objective, you should select the verb that represents the intended cognitive process.

1. Remember. This process refers to the retrieval of knowledge. You could use the verbs such as identify, recognise, distinguish or recall.
2. Understand. This category refers to the construction of meaning. You could use verbs such as interpret, classify, summarise, describe, discuss or explain.
3. Apply. This category refers to the performance of a task in a given situation. You could use verbs such as apply, use, illustrate, demonstrate, execute, practise or implement.
4. Analyse. This process refers to the breakdown of information and the determination of relationships. You could use verbs such as analyse, differentiate, distinguish, estimate, observe, organise, compare and attribute.
5. Evaluate. In this category, the objective is to pass judgement. You could use verbs such as evaluate, assess, test, appraise, select, check and critique.
6. Create. This cognitive process refers to the formation of a coherent structure. You could use verbs such as generate, plan, formulate, propose, design, organise, synthesis or produce.

Type of knowledge

There are four types of knowledge that your article is likely to convey, that is to say, factual, conceptual, procedural and metacognitive. The precise examples of knowledge will depend on the content of your article.

1. Factual knowledge refers to the basic details regarding the subject matter eg nomenclature
2. Conceptual knowledge refers to the organised relationship between basic details eg classification and principles.
3. Procedural knowledge refers to information which is required for a subject-specific skill, technique and criteria for appropriate use.

4. Meta-cognition refers to knowledge of general strategies for learning and knowledge of self-capability.

If you combine the six types of cognitive processes with the four types of knowledge, then you can see that there can be 24 permutations of learning objectives.

Some possible examples of learning objectives in relation to the anaesthetic machine are listed below. Each statement contains both a verb of the cognitive process and a description of the type of knowledge.

After reading this article, the reader should be able to:

1. Recall the components of an anaesthetic machine.
2. Explain the safety features of the anaesthetic machine
3. Turn on the emergency oxygen supply when the pipeline supply is inadvertently discontinued.
4. Differentiate reasons for failure of delivery of oxygen
5. Critique the utility of new guidelines on how to check a modern anaesthetic machine
6. Plan how safety incidents related to the anaesthetic machine can be prevented.
7. Understand the impact of wall posters on safe practice

These learning objectives relate to the cognitive process and type of knowledge in the following ways:

1. In the first objective, the verb is “recall” and so the cognitive process is “remember”. The components of the anaesthetic machine may be deemed to be “factual knowledge”.
2. In the second objective, the verb is “explain” and so cognitive process is “understand”. The phrase, “the safety features of the anaesthetic machine” refers to “conceptual knowledge” since the reader would have to have some idea of the organisation of the basic components in relation to safety.
3. In the third objective, “turn on” refers to the cognitive process of “apply”. There is procedural knowledge since the task is only done when the pipeline supply is lost.
4. In the fourth objective, the cognitive process is “analyse” since the cognitive process involves the determination of relationships in addition to baseline understanding and application. “Reasons for failure of delivery of oxygen” could be placed into the “conceptual knowledge” category.

5. In the fifth objective, the verb is “critique” and so the cognitive process is “evaluate”. The cognitive process involves the reader’s ability to judge. The “new guidelines” refers to “procedural knowledge”.
6. The sixth objective contains the verb, “plan” and so the cognitive dimension is “create”. The knowledge dimension of safety incidents could be classified as “conceptual”.
7. In the seventh objective, the cognitive process is “understand” and the “impact of wall posters on safe practice” refers to meta-cognition. There is some insight regarding how wall posters reinforce factual, procedural and conceptual knowledge.

In conclusion, a learning objective should contain a combination of the verb of one of the six cognitive processes and an example of the level of knowledge.