

Uncover and Address Common Misconceptions

Misconceptions are erroneous understandings that may be formed through our everyday experiences, or they may be the result of prior incorrect or incomplete instruction, or they could arise because the content is counterintuitive or quite complex (Burgoon et al., 2010). Misconceptions can negatively impact learning because students are often unaware that the understanding they have is incorrect and it is often ingrained in their thinking. This can make it difficult for students to process new information because they have to first “unlearn” or replace their incorrect understanding. Although misconceptions are quite common in the sciences, they do occur in all areas.

Types of Misconceptions

- **Factual misconceptions** are incorrect facts often learned at an early age and retained unchallenged into adulthood.
- **Conceptual misunderstandings** are what students think they understand based on their personal experiences or what they may have heard. These often result from an incomplete understanding of a concept. For example, a person sees the sun move through the sky each day and assumes that the sun revolves around the earth.
- **Vernacular misconceptions** arise from the use of words that mean one thing in everyday life and another in the context of your course.
- **Nonscientific beliefs** include views learned by students from sources other than scientific education, such as religious or mystical teachings.

Uncovering Misconceptions

- **Identify Common Misconceptions in Your Field.** Begin by reviewing instructors’ manuals, textbooks, and your own experience with teaching to identify common misconceptions that students may hold regarding the material you are about to teach (Savion, 2009).
- **Uncover Student Misconceptions**
 - Ask students to write down what they already know or think they know about the material being covered.
 - Assess students’ misconceptions through a quiz that includes responses that reference possible misconceptions (Cakir, 2008).

Addressing Misconceptions

- **Use Student Preconceptions as a Tool for Priming Student Thinking.** After assessing student preconceptions about material, it is important to consider which components of their already acquired knowledge could be beneficial in building a more robust understanding of new concepts. When students come into a course with prior knowledge, even if it is inaccurate, it could be evidence of previous content coverage. Although it may seem that misconceptions are only a barrier to learning, when used properly they can serve a productive purpose in the classroom (Larkin, 2012).
- **Show Why the Misconception Is Wrong.** It can be helpful to share that many people hold the same misconceptions and to explain where these misconceptions may come from.

- **Make a Case for the Correct Information**
 - Present the known facts and show how these known facts compare to the misinformation.
 - Show that the new information, theories, or concepts are consistent with other knowledge and are supported by evidence.
 - Show that the new information can be applied to a range of problems or situations.
- **Check on Student Mastery of the Correct Information.** Include specific questions on assignments, quizzes, exams, and quick checks that assess how well students have unlearned the misconception and have mastered the correct content.

Sources

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- Savion, L. (2009). Clinging to discredited beliefs: The larger cognitive story. *Journal of the Scholarship of Teaching and Learning, 9*(1), 81–92.