

Principles of Learning

In General

1. Learning is an **active process** that each student must go through. For students to be able to learn, they must engage in activities such as: *doing, thinking, predicting, experimenting, remembering, asking questions, explaining, discussing, and making connections*.
2. Learning involves **integrating** new knowledge and skills into what students already know. Giving students a chance to **activate their prior knowledge** can help them make connections, but learning can also be **hindered** by prior knowledge and experiences.
3. Learning requires an **appropriate level of challenge** as students are learning, which means that the task requires effort but in an interesting or enjoyable way.

Helping students encounter and clarify knowledge and skills

4. Students have **limited working memory** and get easily overloaded, so it is important to **reduce cognitive load** by breaking down skills and knowledge into **smaller chunks** and helping students **organize content** (Ex. outlines, graphic organizers, tasks).
5. Students need to see the **'big picture'** and the **context** (i.e., when/where/why this is used), and see how the content is **relevant** to their lives.
6. Students **focus their attention** more when they feel an **immediate need** (ex. solving a problem, answering a question, or doing a task). Having a bit of time to think about problems, questions, or tasks before an explanation/demonstration can make them 'hungry' to learn.
7. Students can effectively and efficiently **clarify** new ideas and information through **direct instruction** which is carefully planned, organized, and sequenced by instructors. This can include a variety of **visuals, explanations/analogies, examples, stories/experiences, and demonstrations** that **fit the content**.

Helping students remember, internalize and improve knowledge and skills

8. When learning something new, **recognition** is usually easier than **production** (ex. hearing and identifying something before being able to say or do it).
9. Memory and skill development can be aided by **learning strategies** such as **distributed practice** (i.e., spacing out study sessions), **retrieval practice** (i.e., testing oneself), **interleaving** (i.e. mixing up what you study), and **elaboration** (i.e. explaining content to

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yourself or others).

10. Students need **practice** (i.e. a chance to try, experiment, make mistakes), **feedback** (i.e., what they are doing well and what they need to work on), and **repetition** so that they can make progress toward their goal.
11. Students can benefit from opportunities to **reflect** on their learning/performance and make adjustments to their practice and study plans.

Supporting the social/emotional dimensions of learning

12. Learning often involves and is motivated by **social interaction** with peers and/or with an instructor. Students need opportunities to **express themselves** and share ideas, opinions, and experiences.
13. Students require a **safe learning environment** so that they can focus and feel comfortable engaging in activities and taking risks.
14. Students need to retain a positive **self-image** and **belief** that they are capable of learning the knowledge and skills.
15. Individual student learning can be affected by factors such as **physical/emotional well-being, personality, preferences, habits, attitudes, and beliefs**.
16. Students need some **autonomy** (i.e., freedom in how they study/practice) and can benefit from opportunities for **self-directed learning**, especially at higher levels (i.e., making decisions about what they learn).

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