Challenge Based Learning

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Definition

Challenge-based learning is centred around students collaboratively directing their own learning by investigating and solving a problem posed through an authentic, ill-structured challenge, and discovering and developing knowledge and skills as they develop their solution. Challenge-based learning is a type of inquiry-based learning and is similar to problem-based, project-based, design-based and other interrelated pedagogies.

Purpose

Challenge-based learning supports many elements of the Thrive Agenda and other capabilities, dispositions and attributes currently valued – particularly agency, zest, human connectedness, and deep understanding and skilful action.

CBL benefits students by connecting learning across disciplines and through into real-world challenges, using real-world skills such as self-direction, learning cycles, collaboration and grappling with ill-structured problems.

Suggested pedagogical strategies & examples

A suggested pedagogical framework for CBL would include the following elements:

Setting and investigating the problem:

- The challenge should be real-world, authentic, relevant to students and interdisciplinary
- The challenge should be ill-structured and many different ways of finding a solution
- The challenge should need skills and knowledge relevant to your learning outcomes and/or curriculum
- Students should have opportunities or activities that support them to unpack the problem and consider it from multiple perspectives.

Investigating and learning content and skills:

- Teach investigation skills as needed, such as secondary research, action research, the scientific method and/or design thinking.
- Teach students self-regulation skills and explicit learning and collaborative strategies.

Collecting data and researching:

- Provide resources such as curated lists of useful books, articles or websites, scientific equipment, online data-gathering tools, or technological equipment for creating prototypes.
- Provide investigation-based templates such as journals, logbooks or folios

Summarising, refining and answering:

- Facilitate discussion and deep analysis through the Socratic method or other discussion-based pedagogies.

Presenting solutions:

- Support students to create presentations of their solutions to the problem, such as journal articles, multimedia presentations, research papers, convention displays or other student-chosen methods. The solution method should be an authentic way of responding to the initial challenge, ideally with an authentic audience.

Reflecting:

- Provide feedback to students for them to reflect on their skills and knowledge. This could be written comments, a rubric showing the learning outcomes or a verbal discussion.
- Set up methods for students to self- and peer-assess their research and solution, both throughout the learning process and at the end.

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Effective practice

CBL works best when:

- The teacher models curiosity, wonder and questioning, and is responsive to student needs through the CBL process.
- The challenge lines up with appropriate learning outcomes, such as research skills, design and technology skills or communication in addition to specific content.
- Some explicit teaching is used for research, learning and collaboration.
- Student thinking, reflection and ideas drive the process.
- The challenge is real-world, authentic and ill-structured.
- Students have time to experiment, fail, reimagine and try again.
- Teachers support students by challenging assumptions, teaching skills, providing resources, giving regular and timely feedback, and sparking ideas.

Ineffective practice

CBL is ineffective when:

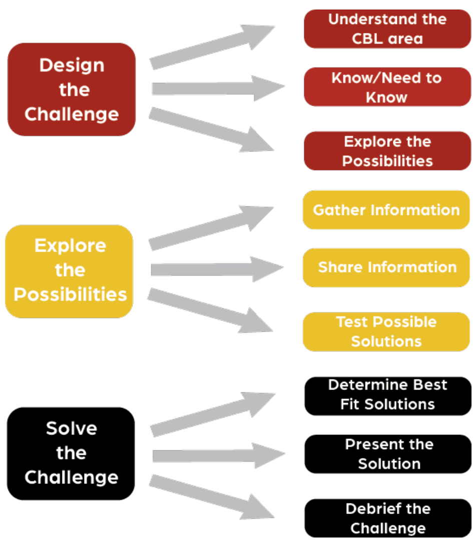
- It is overly prescriptive, especially in terms of specific content or methods for responding to the challenge, specific solutions, or a lack of varied entry points
- The students do not have the skills to investigate, collaborate or self-direct.
- Students do not document and reflect on their processes.
- Students have no relevant prior knowledge to work from.

Further reading or references

Resources (listed as project-based, but still applicable to challenge-based):

- An excellent blog post with lots of links to lists of example projects: https://www.cultofpedagogy.com/project-based-learning/
- Essential project design elements for project-based learning:https://www.pblworks.org/blog/gold-standard-pbl-essential-project-design-elements
- A whitepaper on Challenge-Based Learning, including sample challenges: https://www.challengebasedlearning.org/wp-content/uploads/2019/03/CBL_Paper_2008.pdf

Diagrams



We acknowledge the work of the Illinois Mathematics and Science Academy in developing the Problem Based Learning model.

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