Practical problem: Ensuring that all UCSF medical students have opportunities to become physicians who can work collaboratively within complex systems and engage in efforts to improve complex systems for delivering patient care.

Development of solutions: Use guiding principles from workplace learning and insights from pilots and similar initiatives in other professions and other medical schools to design the Bridges curriculum. For example, identify key criteria for all Bridges placement sites.

Iterative cycles of testing: Evaluate key criteria for student placements by comparing multiple pilot sites by the extent to which they meet the criteria and the student and system level outcomes produced (measured qualitatively and quantitatively); Share these findings with key stakeholders, seek their input and suggestions for improvement in the next cycle. Modify the key criteria and apply the new criteria in the next cycle of Bridges placements.

Reflection on design principles, guiding theory, and solution implementation: Evaluate each design principle. For example, Could the design principles be operationalized? What factors facilitated or posed barriers to fulfilling the design principles? How were the design principles used and what was most and least valuable about them? What needs to be added to the design principles? What did we learn about workplace learning? What have we learned about our proposed solution to the problem?

References:

How does DBR apply to the Bridges Curriculum?

Pearls on Educational Principles:
- Present an influential idea in education
- Suggest examples of its use
- Give an opportunity to apply the idea to your teaching
Design-Based Research (DBR) aims to solve complex, real world problems in education and other disciplines by combining scientific methods of inquiry with systematic approaches to developing and implementing innovative interventions. In the process, DBR also seeks to advance or refine the theories that inform the intervention.

Seven key characteristics of DBR.

- **Interventionist:** aims at designing, implementing, and evaluating interventions in real world settings rather than in simulated ones.
- **Theory oriented:** emphasizes design principles, which are based on a conceptual framework and theoretical propositions; contributes to theory-building through the systematic evaluation of consecutive prototypes of the intervention.
- **Collaborative process:** engages researchers, practitioners/educators, curriculum designers, and learners in the process and acknowledges the expertise that each can contribute.
- **Process oriented:** focuses on understanding and improving interventions, with emphasis on the implementation process and operationalization of the design.
- **Mixed methods:** requires multiple ways of evaluating the implementation process and achievement of desired outcomes, to address complex problems with appropriate interventions.
- **Iterative:** incorporates cycles of analysis, design and development, evaluation, and revision of an intervention. These are known as design experiments.
- **Utility oriented:** measures the merit of a design by its practicality in real contexts.

The figure outlines the stages of Design-Based Research. Although the figure presents a linear model, the process involves many iterations of the cycle and can begin with design principles that are refined throughout.

Related concepts: Action research; implementation science.

A 2012 review of DBR in education found that the majority of DBR interventions have occurred in science education and involve online or mobile technologies. Most studies described multiple iterations of the intervention, and details about context and implementation processes.

Outcomes typically related to student learning, changes in students’ attitudes or motivation, or new understanding of an educational problem and possible solutions.

The examples as explained by Bridget O’Brien, PhD Pat O’Sullivan, EdD