

Learner-Centered Instructional Strategies: A Crash Course

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Abstract

Many students entering the university today are deficient in the 21st century skills of creative problem solving, effective oral and written communication, and critical thinking. In 2011, only 36 percent of college students demonstrated significant gains in critical thinking, analytic reasoning or written communication in four years of college, as measured by the Collegiate Learning Assessment (Arum & Roksa, 2011). The research tells us that if faculty want to prepare students' abilities as creative, analytical, problem solvers who can communicate effectively in an increasingly global world, collaborate well with others, and apply concepts across disciplines to solve complex problems, then they must rely less on lecturing as their major form of teaching. This chapter illustrates the alternatives to traditional college lecturing (e.g. project-based learning, design thinking, team-based strategies, "flipped" classrooms) and how the focus on student-centered learning and redesigned learning environments results in more independent, life-long learners.

'The aim of education should be to teach us rather how to think, than what to think—rather to improve our minds, so as to enable us to think for ourselves...'
(Beattie, B., in Denbow, J., 2004, p. 19)

The Challenge

Many students entering the university today are deficient in the 21st century skills of creative problem solving, effective oral and written communication, and critical thinking. In 2011, only 36 percent of college students demonstrated significant gains in critical thinking, analytic reasoning, or written communication in four years of college, as measured by the Collegiate Learning Assessment (Arum & Roksa, 2011). The President's Committee on the Arts and Humanities (PCAH) noted that American college students "...are increasingly the products of narrowed curricula, lacking the creative and critical thinking skills needed for success in life and work" (2011, vi). At the priority of higher test scores and global competitiveness, national standardized tests have placed our college students at risk in terms of their confidence as learners, believing that 'one right answer' is more important than divergent and self-directed learning.

Our college students' experiences in many K-12 testing-rich education systems have left them to be: (a) more comfortable with being told what to do; (b) anxious about dealing with a level of ambiguity (which in actuality will advance their creative and critical thinking); and (c) unused to doing the work as learners. Largely, U.S. educational practices have produced dependent, passive, and fearful learners who want to be told exactly what to think to pass a test, with teachers doing most of the work of the learning. This has happened as teachers decide the problems to be solved, identify what needs to be learned, prescribe learning methods, and use rigid assessment methods. Effective college teaching, if it is to truly develop

self-directed, independent, and responsible citizens capable of participating thoughtfully in a democracy, must address this gap.

Needs of Today's College Learners

We do know that 21st century learning requires our students to be:

- Well-rounded, socially and emotionally intelligent, disciplined, moral, and culturally competent (Chapman, 2004)
- Diversely and creatively skilled (Le Metais, 2003)
- Possess the ability to know how to think over memorization of facts that will become obsolete (Weimer, 2002)
- Flexible and adaptive thinkers
- Creative, innovative, and independent thinkers
- Self-motivated, collaborative, risk takers (Gullatt, 2007).

The research tells us that if faculty want to prepare students' abilities as creative, analytical, problem solvers who can communicate effectively in an increasingly global world, collaborate well with others, and apply concepts across disciplines to solve complex problems, they must rely less on lecturing as their major form of teaching (Doyle, 2011; Fink, 2003; Partnership in 21st Century Skills, 2007). Lecturing does have its place in the university classroom, especially when talking to students about complex material they cannot learn on their own. However, used as a method of teaching in which students passively listen, then cram for exams and memorize material to prove they have "learned," lecturing is overall an ineffective way to develop 21st century students' creative, critical and practical thinking.

What are we, as teachers and guides to do? We can continue to follow traditional ways of teaching that often focus on covering content (content-centered) and developing memorized knowledge or we can embrace a vision of doing something different that “...would significantly improve the quality of student learning,” says Fink (2003, p. 1). Learning can no longer be defined by students’ ability for producing one right answer. Developing each student’s learning capacities requires more than thinking skills alone, as we know that cognitive development is a multifaceted process involving skills, dispositions, mindsets, and the learning environment, all affecting motivation (Claxton, 2006).

Our challenge as educators is to develop creative, autonomous, and more innovative, life-long learners who can integrate and apply their understandings to solving challenging questions of real world and personal consequence and can advance their own knowledge. To do so, it is important to consider a paradigm of learning that moves students from a passive approach to a shared and active one. We must focus our efforts on shifting most of the *work of learning* to students. Simply put, “It is the one who does the work, who does the learning” (Doyle, 2011, p. 7). This shift requires a greater emphasis on learner-centered rather than teacher-centered paradigms, where teachers do a lot of the work of learning. In this quest, we ask a few essential questions:

- How might we create learning environments and design learning experiences that aid students in developing their analytical, creative, and practical abilities—their successful intelligence?

- How might we develop students' creative and critical mindsets in tandem with social-emotional strengths and self-direction? What kinds of pedagogies and curriculum can bring about this balance?

Developing Balanced and Successful Intelligence

Today's college professors must apply theory to practice in the ways that will build balanced and dynamic learners. The theoretical framework of "successful intelligence" or balanced intelligence is a good model for developing and assessing a balance of students' critical, creative, and practical thinking skills and dispositions (Sternberg, 2008; Sternberg & Grigorenko, 2004). This theory supports intelligence theories and cognitive science research which views learning as a complex, expandable, flexible system; it is affected by student self-beliefs and the culture in which one learns and in turn, affects motivation (Bransford et al., 2000; Gardner, 2007). One's learning ability is modifiable and expandable, not fixed (Resnick, 1999).

Balanced intelligence, rather than be attributed to critical thinking alone, is a balance of skills—critical, creative, and practical. All three are needed and support each other. Critical thinking refers to the process of analyzing and evaluating, solving problems, reasoning with evidence; creative thinking occurs when one uses imagination, finds new solutions, designs or creates a new idea or product. Practical thinking involves applying new knowledge in real life situations (including knowledge learned tacitly) in ethical ways, and it can be identified as social-emotional intelligence or one's ability to present ideas to others (Goleman, 1996).

Creativity is exercised when people take risks without fear of failure and challenge the status quo. Czikszenmihaly (1996) points to the educational environment in fostering

creativity. Additionally, the research tells us that critical and creative thinking operates in tandem—“like the right and left legs walking” (Paul & Elder, 2006, Foreward). One cannot be truly creative without activating critical thinking and vice versa. Both divergent and convergent thinking modes are needed in order to solve problems. Woven together, successful intelligence means it is not enough to memorize and analyze ideas. Students also need creative abilities to generate good ideas and the practical and positive social skills to persuade others of their value and successfully implement them.

Further, balanced intelligence is not simply a matter of acquiring a set of skills; it also involves the development of specific *dispositions*—the inclination, sensitivity and motivation to act upon one’s skills in multidisciplinary ways (Perkins & Ritchhart, 2004).

Developing Mindsets for Success

Advances in cognitive science, including neuroscience, confirm that our thinking abilities are continually adapting to new information and expanding as we learn, grow, synthesize, and connect to new information (Caine & Caine, 1994). Aptitude is no longer considered equal to cognitive abilities; people’s capacity to learn also includes motivational and affective facets, or dispositions such as motivation, persistence, and risk-taking (over and above *ability*) that contribute to intellectual behavior and deep learning (Perkins & Ritchhart, 2004; Posner, Rothbart, Sheese & Kieras, 2008).

Dispositions can be defined as a collection of habits, behaviors, or attitudes that drive one's patterns of thinking and show whether students are motivated to use the skills that they possess. Simply put, dispositions demonstrate that students are ready, willing, and able to use their skills. Claxton (2006) emphasizes that students’ “learning power” is comprised of a

collective mix of dispositions, lived experiences, social relations, values, attitudes, and beliefs that shape an individual's capabilities, and engagement (p. 10). According to Claxton (2006), the four key learning dispositions of powerful learning include resilience, resourcefulness, reflection, and reciprocity (or relationship). These dispositions, often fostered in more learner-centered environments, effect and expand students' overall capacity to learn and achieve. Thus, it is important to involve students in establishing learning goals that reward them for evidence of these dispositional factors and supports them in becoming directors of their own learning.

Sternberg (2008) highlights the three dispositional R's: reasoning, resilience, and responsibility:

- Reasoning (creative, critical, and analytical thinking; practical and wise thinking)
- Resilience (persistence and 'drive' to achieve goals despite life obstacles; self-efficacy: belief in one's ability/goals)
- Responsibility (ethics, wisdom, care, right action)

The learning environment strongly influences students' belief systems about their capabilities and potential as learners (Claxton, 2007; Resnick, 1999). Those who hold a belief that their abilities are expandable will achieve success, because they are willing to risk and engage in challenging tasks that affect their intelligence and achievement. *A culture that supports learning from failed attempts is vital.*

Redesigning Learning Environments

We won't meet the needs for more and better higher education until professors become designers of learning experiences and not teachers. – Larry Spence (2001, p. 2)

As teachers, we are designers. We create new curriculum; we design deep learning experiences for students; we fashion cultures of learning that develop their creative confidence; we devise authentic ways to test. We are creating design solutions all the time, while also considering how learning occurs, our students' unique needs, and our goals for them as learners. Teachers design the kinds of learning experiences and environments that develop students' independent, creative, and flexible action.

In our goal to train students that possess a balance of creative, analytic, and practical skills and dispositions, teachers must be purposeful about the learning and thinking culture they create. Beyond dispensing the right course content, assuring that students 'learn' is an organic process—one that relies highly upon integration (connection making), student autonomy (self-direction), and individual and social expression (inquiry).

Teaching practices at every level, but explicitly at the college level, will require new paradigms of teaching and learning that move away from lecture-style pedagogies in order to truly engender the creative and critical capacities of our 21st century students. Research tells us that a learner-centered teacher can transform the college classroom environment (Weimer, 2002). In the university setting, a redesigned educational experience is needed that will foster creativity as well as learner autonomy (Cullen, Harris & Hill, 2012). A learner-centered paradigm has this potential.

Constructivism and Learner-Centered Philosophy

Neuroscience, biology, and cognitive psychology inform us that learning, understood as deep understanding, cannot be imparted; it is a constructive and often social process. Learner-centered classrooms are inherently constructivist in theory, building on approaches to education, which contend that students should be actively involved in the learning process, rather than passively absorbing information that is imparted to them from teachers and textbooks. The focus is less on covering material and more on using content to develop new and personal ways of using it.

A learner-centered classroom shares ideals promoted by notable researchers in educational psychology and philosophy, including John Dewey (1938), who proposed that students should be self-directed and active learners. Piaget (1952) strengthened this work, as he recognized that knowledge is not acquired in a vacuum or by absorbing information; it is constructed through direct involvement and making connections to prior learning. Lev Vygotsky (1978) added the importance of social learning in cognitive development.

Learner-centered philosophy promotes students' deeper understanding, integrative understandings, and meaning making through first-hand experience or active learning and is supported by a vast research base indicating its effectiveness (Bransford et al., 2000; Cullen et al., 2012; Doyle, 2011; Fink, 2003; Weimer, 2002). In a balanced view, learner-centered goals build upon the pillars of connection-making, inquiry, and student self-direction (Ingalls Vanada, 2011). These ideas coincide with Sternberg's ideals of building students' creative, critical, and practical thinking skills (see *Figure 1*). As mentioned, learner-centered classrooms promote Sternberg's ideas (Claxton, 2006; Perkins & Ritchhart, 2004) along with deeper engagement.

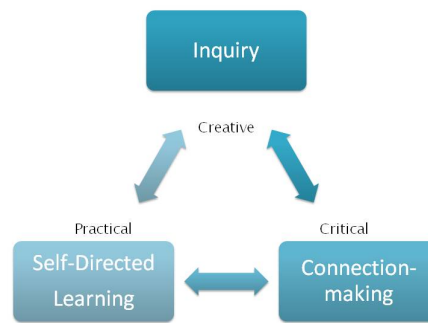


Figure 1. Balanced Learning Environments

Rather than a strict content and discipline-focused approach, an LC curriculum is often organized around problems or complex big ideas: philosophical issues or theories of social concern that require multidisciplinary, authentic, real-life solutions (Constantino, 2002; Cullen et al., 2012). In these big-idea classrooms, students make connections from disparate sources and across disciplines, developing what Howard Gardner (2007, p. 45) calls, “a synthesizing mind.” They are engaged in inquiry-based and integrated learning methods, which enhance quality- thinking skills. This is a “learning with understanding” approach (Bransford et al., 2000, p. 8), wherein the explicit role of the teacher is to arouse motivation for investigative learning by provoking interest or challenging misconceptions and taken-for-granted beliefs. Since understanding is not merely imparted, active investigation is an essential activity—finding a problem, asking a question, and searching for knowledge to answer it. Not only does an LC classroom provide opportunities for more individualized student needs and interests, students are given more freedom to demonstrate their deeper understandings. *Figure 2* outlines primary learner-centered principles, with further information in Appendix A.

Traditional Classrooms: Product-based (outcomes)	Learner-Centered Classrooms: Process-based (understanding)
Focus on memorization/ rote-learning	Focus on engaging deeper & more meaningful learning
Focus on lower-level thinking	Focus on higher-order thinking: synthesis, analysis, evaluation, connection-making
Passive learning	Active learning
Teacher-centered: teacher as disseminator of knowledge	Student-centered: teacher as facilitator and coach
Culture of “one right answer”/ knowing	Culture of “thinking”/ learning/ questions
All students taught exactly the same	Learning is differentiated, made personal and meaningful
Fragmented, silo- curriculum	Interdisciplinary and integrated learning
Assessment goals set by teacher/school; mainly summative	Students involved in setting learning goals; mainly formative; demonstrations of understanding

Figure 2. Learner-centered principles

Shifting to Learner-centeredness

“If learning is regarded not as the acquisition of information, but as a search for meaning and coherence in one’s life and, if an emphasis is placed on what is learned and its personal significance to the learner, rather than how much is learned, researchers would gain valuable new insights....” – Philip Candy, 1991

Much has been written about the impacting shift from a teacher-centered to learner-centered focus in the undergraduate classroom (Cullen et al., 2012; Doyle, 2011; Weimer, 2002). In a constructivist classroom, the teacher role shifts from being the source and dispenser of knowledge to becoming a facilitator, not a “sage on the stage” (Norman, 2000, p. 93).

Constructivist teachers consider themselves co-learners and guides who place the responsibility for learning in the hands of the students, knowing that “It is the one who does the work, who does the learning” (Doyle, 2011, p. 7). *Figure 3* provides a basic outline of the shift of power in an LC classroom.

	Teaching/Teacher Focus	Learning/Learner Focus
Course Design	What do <i>I</i> want to teach?	What do <i>students</i> need to learn?
Teacher's Role	What will <i>I</i> do to teach this material?	What will <i>students</i> do to learn this material? How will <i>students</i> be given more choice in what and how they learn?
Success Criteria	How well do <i>I</i> perform in the classroom?	How well do my <i>students</i> perform in and out of the classroom now and in the future?

Figure 3. (Adapted from Fink, 2003)

Learner-centered pedagogy, at its best, should be about helping students find success and satisfaction in approaching and accomplishing challenging tasks in which they are personally invested, emphasizing the internal factors of agency and self-efficacy. An educational goal for all college teachers is assisting students in their journey towards being able to define a sense of their own beliefs, identity, and relationships—essential toward constructing their own knowledge and future goals. These ideals are embodied in Zemelman, Daniels, and Hyde’s (1998) *“Thirteen Principles of Best Practice,”* which promote their belief that all classrooms should be:

- Learner-centered (focus on students’ real interests, encourage student questions)
- Experiential (active, hands-on, and immersed in the content of every subject)
- Holistic (whole ideas, events and materials in purposeful contexts...not isolated)

- Authentic (real, rich, complex ideas)
- Expressive (use of communication: writing, drawing, poetry, dance, drama, music, movement, visual art, and the visual display of ideas)
- Reflective (immersion in experience and expression balanced with reflection)
- Social (learning as socially constructed)

In an LC approach, the goal is shared power and increased choices for students. Sharing power happens by providing choices in the policies and procedures of the classroom and by designing curriculum in ways that give students a say in what and how they learn, its relevance, as well as how they will demonstrate their knowledge and understanding. In so doing, teachers are placing the responsibility for learning in the hands of students—where it belongs—and “...optimizing their opportunity to choose to engage, participate, share, and work hard at the learning process” (Doyle, 2011, p. 78). Students are asked to take on more responsibility for their own learning, because they will be responsible for it the rest of their lives.

A primary goal, and essential to 21st century learning, is the development of student autonomy, self-direction, and creative confidence, which occur in more learner-centered college classrooms (Cullen et al., 2012). While many faculty members are not comfortable with sharing control with students, shared decision making is key to fostering a learning community and creates ownership for students, which in turn drives motivation, persistence and creativity. Pink’s research (2011) indicates that student performance is increased when three factors are present: autonomy, mastery, and purpose. Autonomy leads to deeper engagement, mastery of a concept or task creates a sense of accomplishment, and purpose feeds the learner’s need for relevance and rigor.

Expect Pushback

Students that have been conditioned for producing one right answer to pass a test may resist more active learning. Learner-centered educators commonly experience resistance on the part of students: (a) there is pushback as to the amount of work involved, even though students are more engaged with the content and develop autonomy as learners; (b) students experience anxiety at first, because projects are more ambiguous and individually focused, rather than tightly mandated by more traditional student-teacher roles. Most students are comfortable with controlled instruction in which they are told what to learn to pass a test. Many are afraid to be wrong, and their former learning experiences did not reward them for the *process* of learning, which often involves iterative failed attempts at something.

Too often, teachers are doing most of the work of learning. We decide the problems to be solved and the questions to be asked, deliver the content, create presentations, control (versus lead) the discussions, preview and summarize the learning content, and develop what to assess. Students push back when we do not. “Am I doing this right?” or “What exactly do you want in this assignment?” they ask. Stepping out of the spotlight and becoming a co-learner can be difficult for both the teacher and the student. Yet, shifting the *work* of learning to students is an intentional strategy that serves to develop students’ personal autonomy, creative confidence, desire to learn, and sustained motivation—factors that are found to further predict and effect levels of learning and achievement (McCombs & Miller, 2007).

The Role of the Teacher

This decentralization of power in the classroom means that teachers become co-learners and guides, with students viewed as active participants in the construction of

knowledge. For learner-centered practice to be effective, roles of faculty and students will change to:

- Students are empowered to assume more responsibility for their learning
- Teachers design and orchestrate learning investigations
- Faculty and students are learners – they both give and receive
- Learners bring more ideas and viewpoints (two-way learning)
- Learners bring substantive expertise (authentic contribution to the whole) (Mayer, 1999)

As a learner-centered teacher, the design challenge lies in providing a context or framework that provides enough structure yet gives students authentic choices about their assignments and demonstrations of learning. In designing and orchestrating learning investigations, students must be nudged out of their comfort zones and access their skills and abilities for original thought and decision making; this is part of the work of learning that can develop their skills as balanced thinkers and doers. Eisinger (2011, p. 2) says, “What is too often missing in the university classroom, is an understanding of the abstract and the ambiguous,” encouraging faculty to incorporate purposeful “untidy open-ended exercises” and to “*teach ambiguity*” in order to creatively engage students in the social and political tensions of a democratic society. If a level of ambiguity is purposefully designed into students’ learning experiences, they are more likely to exercise their abilities to question, make connections, and re-think possible solutions and innovative ideas. If our goal as teachers is the recall of facts, we are not equipping students in areas of problem finding and complex problem solving.

Research indicates valuable links between designing open-ended, project-based inquiries that allow relevance, meaning, and student motivation. It is the quality of the experience that counts, and, “Teachers cannot merely transmit information or skill...the teacher needs to behave like an environmental designer, creating situations that will, in turn, create an appetite to learn” (Eisner, 2002, p. 50). There may be less focus on the end product (typically the first step in most teachers’ planning), and more on students’ explorations into the big ideas teachers set forth—philosophical issues or theories of social concern, within a problem-based environment for learning. “Problem-based learning can organize the curriculum and challenge students to think deeply about complex situations, when it is applied as an authentic real-life application,” states Constantino (2002, p. 224).

LC teachers involve students in finding problems that lead to inquiry- driven investigations related to big ideas of cultural depth and cultural capacity, thus making connections in the process. Students must be the ones to *frame* the problems being solved! Fink (2003, p. 104) outlines active modes of learning (versus passive learning of receiving information and ideas) that are designed into the curriculum to include doing, observing, and reflecting:

- Doing: any learning activity that involves students in designing and conducting investigations, connecting ideas, engaging in a real or simulated action in an authentic settings, making oral presentations, analyzing and synthesizing ideas, writing essays, etc.
- Observing: watching, listening, or experiencing demonstrations or real-life examples of whatever they are learning about

- Reflecting: making meaning by consciously reflecting alone or dialoging with others, journaling, visual reflections, etc.

Learner-Centered Goals

As communities of learning, learner-centered classrooms promote student choice, student ownership and responsibility, connection making, and opportunities for inquiry-driven processes. Even in very large university classes, LC strategies can promote the three pillars of learner-centeredness (Ingalls Vanada, 2011):

- Self-direction: Submission of discussion postings and accessing course readings through the online management system; classroom attendance; reviewing posted class materials to study for exams (vs. study guide); self-assessments;
- Connection-making: Reading of assigned articles and expectation for preparedness; provocative journal entries and personal art making; authentic assessments;
- Inquiry: Promote dialogue through Socratic questioning or other dialogic processes; discussions in class; first-hand observation; doing to learn.

To promote dialogue, Socratic questioning is offered as a pedagogical tool for exploring alternative points of view, investigating big ideas, and activating cognitive processing (Caine & Caine, 1994). One key aspect of a learner-centered class is that participants are given opportunities to reflect on what and how they learn, as well as their own creativity and thinking processes. Journaling is a significant way for students to link to prior knowledge and share their insights, as they write and use other creative means (McCombs & Miller, 2007).

Also, it is important to consider the incorporation of course goals that focus on the development of 21st century skills and dispositions, such as:

- **Critical Thinking:** Problem solving requires application of learning and creativity to a specific area of inquiry. Preceded by a set of skills, a critical thinking skill focuses on the essential elements of a problem, sorts through data for relevant information, and applies the dispositions of persistence and tolerance to work within ambiguous situations, with flexibility and self-direction. In addition, problem solving involves the ability to tap into the expertise of others in order to solve complex problems (social/emotional dimension).
- **Creativity and Innovation:** Creativity is essential for successful intelligence; creative skills help foster a vision for students and can make the world a better place along with needed analytic and practical skills and wisdom.
- **Communication and Collaboration:** Innovation has a social component and requires adaptability, leadership, teamwork, and interpersonal skills. Our creative and critical capacities are linked to the ability to connect with others. 21st century students must be able to clearly articulate their ideas, work with diverse teams, make necessary compromises to accomplish a common goal, and other communication competencies (Partnership for 21st Century Skills, 2007).

Active and Experiential Learning Methods

Some forms of active, experiential learning may include (Fink, 2003, p. 20):

- Role-playing, simulation, debate, and case studies
- Writing to Learn
- Small Group Learning
- Assessment as Learning
- Problem- and Project-based Learning

- Service Learning
- Design-based Learning (Design Thinking)

Assessment as learning. Assessment as learning occurs when students reflect and monitor their progress to inform their future learning goals. It is regularly occurring, formal or informal (e.g. peer feedback buddies, formal self assessment) and helps students take responsibility for their own past and future learning. It builds metacognition as it involves students in understanding the standards expected of them by setting and monitoring their own learning goals as well as developing strategies for working towards achieving them.

(<http://www.education.vic.gov.au/school/teachers/support/pages/module4.aspx>)

Problem-based learning. In a problem-based learning (PBL) model, students engage complex, challenging problems and collaboratively work toward resolutions. PBL is about students connecting disciplinary knowledge to real-world problems—the motivation to solve a problem becomes the motivation to learn. Problem-based learning typically follows these steps:

- Presentation of an "ill-structured" (open-ended, "messy") problem
- Problem definition or formulation (the problem statement)
- Generation of a "knowledge inventory" (a list of "what we know about the problem" and "what we need to know")
- Generation of possible solutions
- Formulation of learning issues for self-directed and coached learning
- Sharing of findings and solutions (http://bie.org/about/what_pbl)

Project-based learning. This type of learning is an approach to learning focusing on developing a product or creation. The project may or may not be student-centered, problem-

based, or inquiry-based. Project-Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to a complex question, problem, or challenge. Essential Elements of PBL include:

- **Significant Content** - At its core, the project is focused on teaching students important knowledge and skills, derived from standards and key concepts at the heart of academic subjects.
- **Driving Question** - Project work is focused by an open-ended question that students understand and find intriguing, which captures their task or frames their exploration.
- **Need to Know** - Students see the need to gain knowledge, understand concepts, and apply skills in order to answer the Driving Question and create project products, beginning with an Entry Event that generates interest and curiosity.
- **Voice and Choice** - Students are allowed to make some choices about the products to be created, how they work, and how they use their time, guided by the teacher and depending on age level and PBL experience.
- **Critique and Revision** - The project includes processes for students to give and receive feedback. (http://bie.org/about/what_pbl)

Design-based learning. One way to engage students in authentic, inquiry-driven, collaborative, project- and problem-based learning is through the method of design-based learning that utilizes the process of “design thinking.” Design thinking, as related to constructivist paradigms, learner-centered pedagogy, and project-based learning is considered a collaborative, problem-solving framework that promotes deep and relevant learning (Carroll, Goldman, Britos, Koh, Royalty & Hornstein, 2010, Ingalls Vanada, 2013). Also found to promote critical thinking, creativity, integrative connection making, and student self-direction, design thinking processes work to engage students in empathic inquiries and solving problems of social interest in an integrated way. Seeking for ways to meet human needs fosters empathy.

Design thinking is aligned with active and experiential learning; it has long focused on processes familiar to students in schools of art and architecture: the posing of a problem, which is ambiguous or open-ended with some constraints. Thus for teachers, design thinking requires a pedagogical shift toward learning that is: (a) human-centered; (b) action oriented; and (c) process-oriented (Carroll et al., 2010).

Design thinking phases include: (a) developing understanding and empathy through observation and need finding, (b) problem solving, (c) generating multiple possibilities, (d) prototyping, then (e) testing solutions. The key phases of the design thinking process, as identified by the Hasso Plattner Institute of Design or “d.school” are shown in *Figure 2*.

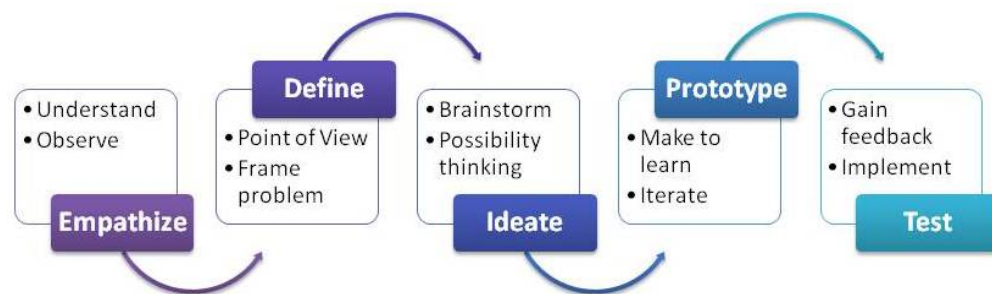


Figure 2. Overview of the design thinking process (d. school as cited in Carroll et al., 2010)

Using design thinking methods as a form of inquiry and research, the teacher-student relationship is decentralized, as the classroom government and decisions are shared. DT methods provide enough structure, while allowing for student autonomy and choice as students design solutions, construct knowledge by problem solving, learn from mistakes, reflect, and engage in iterative solutions.

Conclusion

In order to equip students toward success in learning and life in the 21st century, there has been a recognized need for college classroom environments that value critical, creative,

and practical thinking and serve to build students' confidence and overall capacities as life-long learners. In the privilege of assisting students in their educational and life goals, we also face the challenge of building students' mindsets for success and social-emotional growth.

Toward this end, this chapter has explored the various ways that learner-centered pedagogy encourages questioning, fosters balanced, deep and collaborative learning, and changes the narrow canon of assessment practices. We've looked at the kinds of pedagogies and curriculum that can bring about powerful learning in our students, to promote their self-direction, self-efficacy, confidence, motivation, and desire to learn—having the most impact when teachers are role models of curiosity, open-mindedness, and shared power (McCombs & Miller, 2007; Weimer, 2002).

The shelf life of knowledge is shorter than ever in our information-rich society, making the learning of facts less important than teaching students how to think, problem-solve, create, evaluate, and work in teams. As we face the challenge and privilege of training successful college graduates—escalated from 3 percent to 32 in the last 100 years—we are called to participate in a paradigm shift in the role we play at this pivotal point in their lives (Spence, 2001). It is not a call to arms as much as it is a call to risk.

We come to the end of this chapter with more questions: If our primary role as a teacher is considered to promote students' lifelong learning skills as well as the confidence and motivation to use those skills, what kinds of teaching, learning investigations (assignments), and classroom environment factors must we consider? How will course design change? How might we encourage students to assume more responsibility for their own learning? How might

course content become more than something we cover—and become the means rather than the end?

One thing is sure. This path to building a more learner-centered, big idea classroom requires a vision of what can be. Students will need to understand why it is important for them to build a balance of their thinking skills and dispositions—that they are more than passive consumers; they are active creators and designers of their futures. To foster buy-in for a more investigative, integrative, reflective, and active ways of learning, sameness will be questioned. Students will need to be rewarded for flexing their “learning power” muscles (Claxton, 2006, p. 1), and we applaud your efforts in moving teaching to a different and more learner-centered place.

In Appendix B, you will find links and opportunities in a variety of learner-centered strategies that can be integrated into your coursework. To incorporate even one idea or part of these ideas is a worthwhile adventure in developing more independent, life-long learners.

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Appendix A

Basic Learner Centered Principles

1. Transfer of energy to students doing the work of learning. The ancient Chinese proverb, “I hear and I forget. I see and I remember. I do and I understand,” holds learner-centered truth. Develop student autonomy and self-regulation by intentionally crafting self-reflection, self-observation, self-judgment, and self-reaction into courses (Zimmerman & Schunk, 1994 as cited in Cullen et al., 2012).
2. Shifting power. This shift is one of the most difficult things for many teachers, yet students are empowered when they are allowed to choose and to assume more responsibility for their learning. Give students a VOICE! Let them define the problems that need solving when it comes to learning, education. The brain attaches to ideas of deep personal meaning and relevance, so students need to be involved in the problem finding. It can’t be the teacher’s decision alone. Empower them to be the change they want to see in the world.
 - Faculty and students are learners – they both give and receive. Adopt an “I bring something, you bring something” approach.
 - Learners bring more ideas and viewpoints (two-way learning) and substantive expertise (authentic contribution to the whole).
3. Active Learning: In order for student to do the work of learning, we have to guide, but allow them to make mistakes to learn! Let them get it wrong and reward revision, growth, and reflection on what has been learned from mistakes. Provide an environment for safe risk-taking with teachers who can provide guidance, ask good

questions, scaffold the learning, and provide a rigorous pace. Experience is the best teacher, and real-world experience is even better.

Appendix B

Alternative Instructional Strategies Resource Guide

To make students *active learners* requires that you sometimes “let go” of the best-prepared lectures and course content. The following links demonstrate examples of learner-centered activities that can be integrated into your course – even adding one learner-centered activity can put you on the road towards “flipping” the classroom.

Alternative Strategies and Active Learning

This link references a 3-page document that is adapted from *Teaching at Carolina* (1998). Chapel Hill: Center for Teaching and Learning, University of North Carolina. This summary provides suggestions in peer teaching, case studies, simulations, cooperative learning groups, and peer teaching. In each category, there are suggestions for learner-centered activities for multiple disciplines. For example, case studies “are appropriate for learning about information analysis, decision making, or problem solving.” The example is for anthropology, but the techniques can be applied to a myriad of courses.

http://www.unl.edu/gradstudies/current/teaching/Teaching_Strategies.pdf

Another good resource is the collection of exercises and techniques illustrated in “Active and Cooperative Learning” site by Dr. Donald Paulson and Jennifer Faust. Each technique is illustrated with an exercise and an evaluation tool.

<http://web.calstatela.edu/dept/chem/chem2/Active/>

The Flipped Classroom

This colorful “infographic” illustrates how the “flipped” model works and gives a brief history and current successful examples. A lively discussion follows with teachers weighing in on the pros and cons – and whether this model is a new approach at all.

<http://www.knewton.com/flipped-classroom/>

“Welcome to the Virtual Crash Course in Design Thinking”

The d.school at Stanford has an innovative “crash course” in Design Thinking: in ninety minutes, participants are taken through “The Gift-Giving Project: a fast-paced project where participants pair up to interview each other, identify real needs, and develop a solution to ‘redesign the gift-giving experience’ for their partner. The three-part experience breaks down the basic components of Design Thinking and shows how it can be applied in both small and large-group sections. <http://dschool.stanford.edu/dgift/>

An excellent book on the power of design thinking in the classroom:

Kelley, T. & Kelley, D. (2013). *Creative confidence: Unleashing the creative potential within us all*. New York: Random House Publishers.

“The Importance of Student Journals and How to Respond Efficiently”

This *Edutopia* article seeks to answer the question, “How do I possibly have time to respond to student journals?” While this article is written for high school teachers, the principles of “journal coding” can be applied to any subject matter at any level.

<http://www.edutopia.org/blog/student-journals-efficient-teacher-responses>

Alternative Web-Based Instructional Strategies: Creative, Critical, Cooperative

Web-based instruction is nothing new, and Moodle provides a number of opportunities to encourage learner-centered activities. In *Web-based Instruction*, edited by Badrul Huda Khan, the authors suggest that the Internet should be used as a creative tool to help students “...sense gaps in information, make guesses and hypotheses, test and revise ideas, and communicate results.”

Team-Based Strategies

The Team-Based Learning Collaborative is an interactive site with a variety of resources (large-classroom ideas, video, text) that focuses on how teams can help make active learning possible, even in the large lecture hall. A short twelve-minute video is a good introduction to the basic principles. The Collaborative also hosts conferences and provides research grants.

<http://www.teambasedlearning.org>

Another excellent resource is the Collaborative Learning Techniques Workshop, presented by Bill Cerbin, April 23, 2010, Center for Advancing Teaching and Learning. This document link below addresses concerns about collaborative/team-based learning, including questions on grading and monitoring groups. There are additional resources, links, and references contained in the document.

<http://www.uwlax.edu/catl/studentlearning/presentations/collaborativelearningtechniqueshandout.pdf>