Constructivist Approaches

I. Title

Constructivism is not one theory but a coming together of many instructional approaches. This presentation provides a brief overview of constructivism, discusses constructivist learning conditions, and offers applications for medical educators.

II. Constructivism

As there is no single constructivist theory of instruction, constructivism has many roots in current psychological and philosophical work. It is derived out of cognitive and developmental notions from Piaget; perspectives on the interactional and cultural nature of learning by Bruner and Vygotsky; situated cognition theory; philosophical approaches of Dewey, Goodman, Derrida, Foucault; and the work of von Glasersfeld and Kuhn. The gist of constructivism is the "knowledge is constructed by learners as they attempt to make sense of their experiences" (Driscoll, 2005, p. 387).

III. Constructivism (Cont.)

Constructivists argue that learning should be done in context. Constructivism supports learners identifying and pursuing their own learning goals. Learners should be engaged in meaningful activity and be able to apply their knowledge as part of the learning process. Students are not viewed as passive receivers of knowledge; instead, they are "actively involved in determining what their own learning needs are and how those needs can best be satisfied" (Driscoll, 2005, p. 399). Some examples of constructivist approaches include inquiry models, microworlds, hypermedia, and problem-based learning. Lectures can still be a part of the constructivist classroom, but they won't look like this -

IV. "Ferris Bueller's Day Off" video clip

V. Lectures Inspired by Constructivism

So, instead of "delivering" content by talking at students, as illustrated in that clip from "Ferris Bueller's Day Off," consider incorporating some lecture tips from Malik and Malik (2012) inspired by constructivism. Malik and Malik describe 12 tips, and I will highlight four in this presentation that I think are particularly useful. First, lecturers should "involve students in the learning process" (Malik & Malik, 2012, p. 198). Communicate expectations for when students should ask questions during a lecture and affirm them when they ask deep, relevant questions.

"Help students to see the relevance of their learning" (p. 200). Present concepts within an authentic, realistic context that will enable them to connect theory to application. Stories and problem-based scenarios are great ways to introduce a topic.

"Encourage application of knowledge and teamwork" (p. 201). Incorporate activities within lectures that get students to engage with the material, apply their knowledge, and provide you with some feedback on how well they are understanding the concepts. Possible activities could include solving problems in small groups, watching and then discussing a video clip, generating examples of concepts, and listing advantages and disadvantages of procedures or approaches. For example, Elliott and colleagues (2009) used lecture as part of a constructivist-based professionalism curriculum in which they introduced the concept of professionalism and its significance in students' medical training and daily lives. Part of the lecture incorporated video clips from "Patch Adams."

VI. "Patch Adams" video clip

VII. Lectures Inspired by Constructivism (Continued)

Though I initially included this clip to illustrate the professionalism curriculum from the example Elliott et al. (2009), it is worthy to also note the ways that Patch questions and guides using humor and play in a pediatric ward. Adjusting his approach to do these things allowed him to connect better with his patients. This leads to a fourth lecture tip inspired by constructivism - "Be a vigilant facilitator" (p. 202). Be observant of student non-verbal signals that indicate their attentiveness, involvement, and understanding during the lecture. If you get a sense that the learners are losing interest or getting sleepy (as was the case in the Ferris Bueller clip), consider taking a quick stretch break, telling a story of your personal experience, or switching to an activity.

VIII. Constructivist Classrooms

To provide you with a better idea of what a constructivist classroom looks like, I will contrast key features of constructivist classrooms with those of traditional classrooms, with which you may be more familiar. In traditional classrooms, the curriculum is often presented in a part to whole fashion, with emphasis on acquisition of basic skills. In constructivist classrooms, the curriculum is presented whole to part, and big concepts are emphasized. In traditional classrooms, a fixed curriculum is often strictly adhered to; whereas, pursuit of student questions is more highly valued in constructivist classrooms than sticking to a pre-defined, rigid curriculum. While activities in traditional classrooms often rely heavily on text and workbook learning materials, activities in constructivist classrooms rely heavily on primary sources of data and manipulative materials. In traditional classrooms, students are often viewed as "blank slates" ready to have learning added to them; whereas in constructivist classrooms, students are viewed as thinkers with emerging theories about the world. Our final comparison involves the role of teachers. In traditional classrooms, teachers generally behave in a didactic manner, disseminating information to learners. In constructivist classrooms, teachers generally behave in an interactive manner, mediating the environment for students. Constructivist instructors engage learners to participate actively using interesting questions, problems, and materials.

IX. Educator Role Shift

So, in constructivist classrooms, educators transition from the "sage on the stage" to the "guide on the side." This role shift is a critical part of supporting a constructivist learning environment, as instructors who jump in with the "right" answers too early risk squelching student inquiry efforts, which is essential in their constructions of personal understandings. This cartoon provides a non-example of a constructivist educator who wants the benefits of constructivism without relinquishing any control of the student learning process – "I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!" From the constructivist approach, the critical thinking will come about when the instructor steps into that facilitator role and allows the student to determine their own learning objectives and start to self-direct their own learning. And know that providing expert guidance during this is essential – just because students are self-directing their learning does not mean that there is no curriculum or lesson structure.

X. Constructivist Educator

According to Brooks and Brooks (1999), the role of an educator in the constructivist paradigm is that of a counselor, consultant, and friendly critic. He or she observes and interprets student social and academic behavior and provides assistance that keeps the inquiry moving along without stopping it. The constructivist educator encourages and accepts student autonomy and initiative and focuses on learning tasks of classification, analysis, prediction, and creation. He or she uses primary sources, manipulatives, and interactive materials to promote an environment conducive to student inquiry and capitalizes on teachable moments, allowing student responses to drive lessons. A constructivist educator is patient enough to allow sufficient wait time to determine students' understandings before sharing his or her own understanding. As mediator of the learning environment, a constructivist educator encourages student dialogue, inquiry, and elaboration, allowing time for students to construct relationships and metaphors. Finally, he or she engages students in contradictory ideas to promote understandings of the complexity of concepts.

XI. Constructivist Learning Conditions

Constructivist learning conditions come from instructional principles concerning motivation, cognition, and social learning theories, and they generally focus on the process more than the products of learning. Constructivists view learning as more meaningful when it is embedded in complex, realistic, and relevant environments. Such environments often involve ill-structured problems that provide learners with opportunities to grapple with the complexity inherent to the domain. Because constructivists consider social negotiation an integral part of learning, it is recommended that collaboration be part of the learning environment. This exposes students to multiple perspectives and often enables them to arrive at new insights and solutions that could not have been reached working separately. Constructivists recognize multiple student perspectives and provide learners with experiences that represent content in multiple modes (such as visual, auditory, or tactile). Multiple modes of representation not only helps learners gain a deeper understanding of complex concepts, it also reduces barriers to learning that

students may have otherwise experienced in a one-mode instructional lesson. Constructivism emphasizes student ownership of learning. Learners are not passive recipients of instruction; they are instead "actively involved in determining what their own learning needs are and how those needs can best be satisfied" (Driscoll, 2005, p. 399). Finally, student self-awareness of the knowledge construction process, or reflexivity, is nurtured. This is similar to metacognition from a cognitive information-processing perspective, but constructivists take the notion a step further in their emphasis of how student self-awareness of meaningful knowledge structures prompts the student to then "invent and explore new structures or new interpretive contexts" (Driscoll, 2005, p. 401).

XII. Universal Design for Learning (UDL)

I'd like to take this opportunity to introduce the Universal Design for Learning framework, as it relates to the multiple modes of representation constructivist learning condition. Universal Design for Learning (UDL) sees the curriculum as often being a student's greatest barrier to learning, because curriculum is commonly a one-size-fits-all approach that does not take into account the varying needs in a group of students. Trying to teach all learners with rigid curricular materials often requires that educators and learners attempt to modify the materials to meet their needs, which can be inefficient and ineffective. UDL, therefore, is a curriculum-design approach in which barriers to learning are reduced by intentionally building into curriculum varying ways to present information, assess what students know, and engage them. So, UDL is considering diverse learning needs from the planning stage of developing instructional materials and activities, rather than trying to find work-around solutions for individual learners during instruction.

There are three UDL framework principles, and they are based on research in neuroscience on the recognition, strategic, and affective brain networks (see http://www.udlcenter.org and http://www.cast.org for more information). These three networks are the "what," "how," and "why" of learning.

The three UDL principles are –

1. Provide Multiple Means of Engagement: Purposeful, motivated learners. Providing multiple means of engagement should stimulate learner interest and motivation for learning.
2. Provide Multiple Means of Representation: Resourceful, knowledgeable learners. Multiple means of representation means presenting information and content in different ways.
3. Provide Multiple Means of Action and Expression: Strategic, goal-directed learners. Providing multiple means of action and expression involves differentiating the ways that students can express what they know. (CAST, 2015)

The Center for Applied Special Technology (CAST) founded UDL and has since been a leader in researching and developing ways that technology can be used to create better learning

experiences for all students. The idea is that instructional flexibility and options are good not just for students who typically experience difficulties in the classroom but for all learners, as all learners have different strengths, weaknesses, learning preferences, and backgrounds of experience.

XIII. Medical Education Applications

With an emphasis on developing critical thinking and meaningful understanding of complex concepts in ill-structured domains, constructivism offers many implications for medical educators. The following recommendations come from the edited volume, *Making Sense of Clinical Teaching: A Hands-On Guide to Success*:

- "Ensure you appreciate what the student knows through questions and observation prior to extending their understanding" (p. 82).
- "Encourage students to look for evidence from history and clinical examination for and against each of their hypotheses" (p. 101).
- "Ask students to 'think out loud' and use the key issues [or findings in a case] in comparing and contrasting their differential diagnoses" (p. 110).
- "Ask probing questions that stimulate collaborative learning, deep understanding, and application of material back to real-life scenarios that one is likely to encounter as a physician" (p. 105).
- "Provide opportunities for your students to apply what they are learning about, soon after they learn it. This will help to solidify their understanding of the topic. For example, you could have them work through cases in groups or as individuals and apply what they just learned to different scenarios" (p. 79).
- "Emphasize the importance of diversity and thinking differently" (p. 117).
- "Encourage students to listen and interact with other members of the medical team and receive feedback and input from them" (p. 101).

XIV. Constructivism (Conclusion)

So, let's return to our initial definition of constructivism - "knowledge is constructed by learners as they attempt to make sense of their experiences" (Driscoll, 2005, p. 387). What you should remember about this approach is that learner reasoning, critical thinking, self-regulation, and application are key instructional goals. Constructivist learning environments embrace the complex realism that is authentic to the content and incorporate social negotiation – interactions among learners and between learners and faculty, materials and other resources. The diversity of perspectives and multiple ways to learn are celebrated, as are student initiation and ownership of learning goals and activities. Constructivist approaches are useful in the medical education context as they can lead to deep, meaningful, action-oriented learning.

XV. Media Credits

XVI. References

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