Criterion	Behaviourism	Constructivism	Cognitivism	Connectivism	Andragogy
Leading researchers	Pavlov Skinner	Piaget Vygotsky Bruner	Bruner Bandara Mayer and Moreno Atkinson and Shiffrin	Siemens Downes	Knowles
Key theories	Pavlov: Classical conditioning Skinner: Operant conditioning	Vygotsky: Zone of Proximal Development, Social Constructivism, More Skilled Other, "private speech" Bruner: Scaffolding	Bruner: Spiral Curriculum Bandara: Mediation, Observational Learning, Social Cognitive Theory Mayer and Moreno: Cognitive Load Theory Atkinson and Shiffrin: Sensory, Working, and Long-Term Memory	Not applicable	Six Assumptions and Four Principles
Summary	Cognition is a black box, focus on what is observable as learned behaviour.	Learners use what they already know to construct additional knowledge. Support from others is important to this process.	Interest in the subject matter and desire to learn are critical as the learner structures information and builds upon previous concepts.	Learning is not something which is "attained." Learners need to manage the abundance of available information by first evaluating the worthiness of what to learn. Knowledge is created first through neural, then conceptual, then social networks. Learning is never complete and there is less emphasis on the individual learner than in other theories.	Adults are not content to learn material so that it will be useful "someday." They need to understand "what's in it for me," bring their personal experience to the learning, and be given the power to be self-directed. The content must be something they can practise in the learning, make mistakes, and use immediately in their work or life.
How does learning occur	Observable response to external stimuli. Positive and negative rewards/reinforcement, neutral operant and punishments.	Self-exploration, imitation, "private speech," discussion and interactions with peers, challenging (Zone of Proximal Development), stretching, support from More Skilled Other	Bandura: Learner observes others and goes through various "mediating" processes to decide whether this is something s/he wants to learn. Then the learner imitates. Bruner: Learner structures ideas to create "schema," or building blocks to create a greater structure of more complex concepts. Atkinson and Shiffrin: Humans can only hold between 5-9 items in the working memory at a time. These then need to be "encoded" through repetition, practice, etc. for them to transfer to long-term memory.	Instructor provides a framework and coaches the learner to seek knowledge using available technology and social networks. From what learners already know, they form connections to new material to synthesise new concepts, and share these with their social networks. Feedback from the social network enhances learning. Learners maintain social networks over time to continue and share learning.	Not described except for incorporating experience and ability to make mistakes into the design.
What motivates the learner	continued rewards and absence of punishment	Satisfaction from challenging onesself and achievement Positive feedback from peers or MSO ("the knowledge community")	Bandara: Learner is an agent who takes initiative to learn. Learner has "self efficacy," or belief that s/he is capable of learning. Bruner: Interest in the subject matter.	Strength of a knowledge "node," the more useful the node is, the more emphasis it will get.	Honouring their experiences, ability to make mistakes in a safe environment, self-satisfaction, orientation to what they will be able to do with the information in daily life.
Advantages (personal opinion)	Effective when used in the correct context	Allows learners freedom to explore and craft their own understanding	Takes into account the need for learner's self-esteem and confidence. Acknowledges human tendency to create structure. Accepts that truly learning a concept takes some repetition and time.	Acknowledges the sheer volume of information available today, and that it's increasingly more required to 1. be interdisciplinary rather than specialised by seeing connections between concepts from different disciplines and 2. more important to know WHERE to get additional knowledge in real-time than to be the fount of all wisdom.	Can be used as a complete methodology for ensuring better participation and learning transfer.
Disadvantages (personal opinion)	Requires considerable consistency to apply the stimuli. Without stimuli the motivation deteriorates.	Resource-intensive-- need several facilitators for small groups to have a rich discussion. For larger groups, significant preparation and structuring of the lesson. Requires expertise from the instructor, which can take time to develop. Learners can get caught up in "the process" and personal dynamics without producing anything (personal experience) May be more challenging to know when the student has learned something or accomplished the learning objectives.	None that I can think of	Can be overwhelming for learners who are used to being spoon-fed with a tightly-controlled set of materials and theories. They will need coaching to feel confident with this approach. Instructors need to be comfortable with chaos and keep learning objectives broad enough to allow for exploration.	Does not seem to be based on as much empirical research as previous theories. Does not account for how we measure whether learning has actually occurred.
Best used for which learning scenarios	Memorising lower-level factual information or physical skills	Learning scenarios where there is not one clear "correct" answer When limited group output is required and the discussion/interaction is the learning	Designing longer-term programmes or courses where interaction between people is desirable and possible.	I could see this being an effective method for homeschooling high-school kids, as well as structuring more granular university courses. Education in nascent or quickly-progressing fields.	Adult learning, ideally in a real or virtual classroom cohort environment.
How to incorporate in learning technology	Gaming features such as points for correct answers, badges for reaching certain levels Rewards for consistent practice Structured exercises such as matching, multiple choice, fill in the blank Timed exercises From Keramida, 2015: Discrimination: determine which of a group of items meet certain criteria Generalisation: apply a set of criteria to all items in a group of objects Association: provide context so the learner understands how to integrate the new information into a given scenario Chaining: teach a sequence of events	Online discussion and feedback (asynchronous) Scheduled virtual classrooms (synchronous) Students work in teams and submit outputs digitally for feedback Iterative improvements to outputs encouraged	Create learning "schema" within the design, and make these structures obvious to the learner. Design to reduce cognitive load (see below) Appoint peer coaches in the team. Ask students to summarise the learning in different formats (graphical, video, audio, etc.) Encourage iterative improvements to outputs. From Mayer and Moreno, 2003: 1. Off-loading: Move some visual processing to auditory (e.g. less text, spoken instead). Pictures are better than text visually. 2. Segmenting: allow some time between training "bites" 3. Pre-training: ensure concepts build on each other, provide names and concepts beforehand 4. Weeding: remove extraneous materials 5. Signaling: provide cues on how to process the information 6. Aligning: if words are necessary, place them as close as possible to the graphic 7. Eliminate redundancy: scale down text if it is redundant with spoken 8: Synchronizing: ensure narration is simultaneous with animation 9. Individualising: ensure learners are able to hold and process spatial/abstract concepts	Provide a framework of concepts but encourage: 1. Independent research using available technology and "riffs on the theme" 2. The learner to publish their thoughts publicly 3. Feedback and discussion in an online community 4. Encourage social-network building, both online and in-person 5. Leverage in-person contacts with professional social media communities such as LinkedIn, XING, etc.	Ask learners to reflect on their related experiences. Include a note-taking and exporting capability. Include a discussion with a mentor or manager before and/or after an elearning session.
Seminal Sources	Keramida, M. (2015, May 25). Behaviorism In Instructional Design For eLearning: When And How To Use. Retrieved November 16, 2017, from https://elearningindustry.com/behaviorism-in-instructional-design-for-elearning-when-and-how-to-use McLeod, S. (2015). Skinner - Operant Conditioning. Retrieved from https://www.simplypsychology.org/operant-conditioning.html	McLeod, S. (2014). Lev Vygotsky. Retrieved from https://www.simplypsychology.org/vygotsky.html McLeod, S. (2012). Zone of Proximal Development. Retrieved from https://www.simplypsychology.org/Zone-of-Proximal-Development.html Author not attributed. Jerome Bruner. Retrieved from https://en.wikipedia.org/wiki/Jerome_Bruner	Smith, M.K. (2002) 'Jerome S. Bruner and the process of education', the encyclopedia of informal education. McLeod, S. A. (2016). Bandura - social learning theory. Retrieved from www.simplypsychology.org/bandura.html Mayer, R. E., & Moreno, R. (2003). Nine Ways to Reduce Cognitive Load in Multimedia Learning. EDUCATIONAL PSYCHOLOGIST, 38(1), 43-52. Retrieved November 16, 2017, from http://faculty.washington.edu/farkas/WDFR/MayerMoreno9WaysToReduceCognitiveLoad.pdf	Siemens, G. (2004). A Learning Theory for the Digital Age. International Journal of Instructional Technology and Distance Learning. Retrieved December 7, 2017. Downes, S. (2010, September 10). Connectivism and its Critics: What Connectivism Is Not. Retrieved December 7, 2017, from http://www.downes.ca/post/53657 Siemens, G. (2009, September 12). What is Connectivism? Retrieved December 7, 2017, from https://docs.google.com/document/d/14pKVP0_ILdPty6MGMJW8eQVEY1zibZ0RpQ2C0cePIgc/preview Discusses how Connectivism differs from other learning theories.	Finlay, J. (2010, May 17). Andragogy (Adult Learning). Retrieved from https://www.youtube.com/watch?v=vLoPiHUZbEw Pappas, C. (2013, May 9). The Adult Learning Theory - Andragogy - of Malcolm Knowles. Retrieved from https://elearningindustry.com/the-adult-learning-theory-andragogy-of-malcolm-knowles Cites Knowles 1984 but there are two sources in the list from 1984, not sure which one.