An Introduction to Theories of Learning

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Over the past half century, American higher education has expanded from an elite audience to the mass market. Audience demographics have changed dramatically, and institutions of higher education are recognizing a need for faculty who are not only successful researchers but are also effective educators. Most faculty in institutions of higher education obtain their positions having proven expertise in their respective disciplines. However, they are poorly prepared as educators[1] and benefit greatly from institutional support in order to improve their teaching effectiveness.

A learning theory is a systematic statement of principles and generalizations that provide a coherent framework for understanding how and why people learn. It was through the work of psychologists and their understanding of human development during the first half of the twentieth century that learning theories emerged. The only thing that remains consistent about learning theories is their steady evolution, incorporating new observations, ideas and technologies as more information becomes available. More recently, learning theories have become specialized, taking into account the diversity of experiences and exposures which shape the human personality: andragogy (the method and practice of teaching adult learners) has expanded the field of pedagogy (the art and science of teaching); cultural influences which affect minorities; how learning disabilities challenge, but not handicap, those who are afflicted.

What follows in this paper is a brief introduction to the main theories of learning. It would be impossible to adequately cover all the theories in existence in one paper and the reader is encouraged to continue exploring the topic. At the end I have provided some sources which I have found reliable. However, there is no shortage of internet blogs, webpages and social media which provide very useful, easily accessible information. It can be overwhelming and time consuming but a fuller understanding of all the exciting advances in the field of education in general, and higher education in particular, will only come through sincere devotion to the task.

—— B e h a v i o r i s m ——

For every individual at every age, from newborn to octogenarian, behaviorists describe natural laws that govern how simple actions and environmental responses shape complex competencies, such as reading a book or making a family dinner. Learning theorists believe that development occurs in small increments and that change is cumulative. The specific laws of learning apply to conditioning, the processes by which responses become linked to particular stimuli; it is sometimes called S-R (stimulus-response) conditioning and there are two types:

Classical Conditioning- More than a century ago, Ivan Pavlov began to study stimuli and their responses. He was primarily a physiologist, using dogs to study digestion (it bears nothing that Pavlov

conducted all his experiments humanely). In 1904 he won a Nobel Prize for the work and his foray into psychology (albeit grudgingly) began. In his experiments, Pavlov observed that the dogs salivated when they were presented with food. This is a normal response, born out of physiological processes. However, after ringing a bell prior to presenting the food, Pavlov was able to condition the dogs to salivate. Eventually, the dogs would begin to salivate whenever he entered the room, even when he was not bringing them food. This is classical conditioning, the learning process where a person is conditioned to associate a neutral stimulus (in the case of Pavlov's dog, the bell) with a meaningful stimulus (the food), gradually responding to the neutral stimulus in the same way as to the meaningful one.

Operant Conditioning- If Pavlov is the father of classical conditioning then the father of operant conditioning is BF Skinner. Skinner acknowledged the veracity of Pavlov's findings and built upon the theories proposed by other early psychologists such as Edward Thorndike and John Watson. Skinner was a true behaviorist, believing that the best way to understand behavior was to look at actions and consequences. Simply put, Skinner's theory states that behavior which is reinforced tends to be repeated; behavior which is not reinforced will not be repeated or, at least, its tendency to occur is weakened. Rewards are consequences that make a behavior more likely and punishments are consequences that make a behavior less likely. However, humans are not quite so easily manipulated:

"Pleasant consequences are sometimes called 'rewards' and unpleasant consequences are sometimes called 'punishments'. For example, parents punish their children by withholding dessert, by spanking them, by not letting them play, by speaking harshly to them, and so on. But it is possible that a particular child might, for instance, dislike the dessert so that being deprived of it is no punishment. Another child might not mind a spanking, especially if that is the only time the parents pays attention to the child. In this case, the intended punishment is actually a reward. Once a behavior has been conditioned (learned), animals (including humans) continue to perform it even if pleasurable consequences occur only occasionally or continue to avoid it even if punishment is rare."[2]

Cognitivism

In contrast to behaviorists, cognitivists do not require an outward exhibition of learning (i.e. through behavior change). The focus of cognitivism are the internal processes and structures involved in learning. Discussions of cognitivism often utilize the metaphor of a computer and how it processes information. Data is acquired from outside, is then stored and retrieved when applicable to a particular cognitive task. Information, then, is transformed to produce new information; learning is an active, constructive, cumulative process.

One of the most influential cognitive theories, and one particularly germane to instructional design, is cognitive load theory (CLT). According to Sweller, it's most prominent scholar, "Information processing properties of human cognition have evolved to mimic the information-processing properties of biological evolution. Just as an evolutionary system requires an enormous store of information to function, so does the human cognitive system. Virtually everything humans see, hear, or even think about is critically dependent on information stored in long-term memory."[3] Long-term memory stores knowledge and skills permanently (more or less) and can store vast amounts of schemas, which are outlines or categories of information. Information becomes stored in long term memory after being processed by working memory (short term memory), which is extremely limited in capacity and duration. Information is held in working memory, rehearsed and then (sometimes) transferred to long term memory. CLT techniques reduce working memory load to ease changes in schemas stored in long term memory.

Social Learning

"Of the numerous stimuli that influence how people will behave at any given moment, none is more ubiquitous or effective than the actions of others." -Albert Bandura

That human beings are social creatures, craving and appreciating the warmth of touch, the affection of a hug, the pride of loved ones, should not surprise us. Social scientists have longed established the benefits of social interaction (relationships formed with family, community and work environments)

on human health and well-being, with some evidence suggesting the effect is stronger in men.[4,5] Social isolation has serious negative mental (depression and cognitive decline) and physical impacts (higher rates of morbidity and mortality).[6]

We learn by observing and imitating each other, and by observing the consequences of others' behavior, not just through the influence of rewards and punishments. Proponents of social learning theory believe behaviorists undervalue the potential of individuals to influence their own behavior and emphasize the role of the individual and the environments in which they live. The environment provides models for behavior and *modeling*, the process by which people copy the actions of others, is an integral part of social learning theory. Also important are the concepts of self-efficacy ("an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments")[7] and self-confidence (firmness or strength of belief but does not specify a goal). Social learning theory is also referred to as social cognitive theory, building upon the premise from cognitivism that learning can occur without an immediate change in behavior; learning is an internal process which may or not produce new behaviors.

This theory of learning is robustly applied in dental and dental hygiene programs of education: students observe experienced, trained dentists and dental hygienists in clinic rotations and are encouraged to model the behavior. This includes not only the learning of clinical skills but learning about professional attitudes and interactions with patients and other members of the clinic staff, the so-called "hidden curriculum".

——— Constructivism ———

"Students should construct their own knowledge"

The constructivist theory of learning is very popular across all levels of education but is particularly favored by institutions of higher education. The learner is not a passive recipient of knowledge rather, an active participant in constructing the knowledge. Because of vast differences in the levels of knowledge (experience) which each student brings, the learning which occurs is highly individualized as the learner is building on his/her own pre-existing conceptual frameworks. Constructivists believe learning is driven by the learner's attempts at finding a solution to a problem utilizing information they already know.

Building on the learner's prior knowledge is of significant importance in constructivism and the process must be interesting, appealing and engaging; it must be meaningful.

——— Andragogy ———

"Today's average student is no longer the 18-year-old whose parents drive her up to "State U" in a minivan stuffed with boxes. Instead, the "new normal" student may be a 24-year-old returning veteran, a 36-year-old single mother, a part-time student juggling work and college, or the first-generation college student. The faces we picture as our college hopefuls can't be limited by race, age, income, zip code, disability, or any other factor." — Ted Mitchell, Under Secretary, U.S. Department of Education[8]

While it has been argued that the ideology behind andragogy constitutes more of a technique than a theory,[9] its relevance in higher education is considerable. According to the most recent data from the National Center for Education Statistics, the number of college students above the age of 25, often called non-traditional students, has been steadily increasingly. The following tables (page 11) illustrate the percentages of part-time and full-time students below and above the age of 25.[10]

It is tempting to use age as a qualifier for "adult"-ism. Adulthood can be defined biologically (the age at which an individual can reproduce), socially (when an individual begins to perform adult roles such as full-time worker, participating citizen, spouse, parent, etc.), psychologically (when an individual develops a self-concept of being responsible for their own life), spiritually and legally (the age that an individual can vote, drive, marry, etc.).

Percentage of full-time undergraduate enrollment in degree-granting postsecondary institutions		
Institution Type	% under 25 years old	% over 25 years old
Public 4-year	88	12
Public 2-year	3	27
Private non-profit 2-year	61	39
Private for-profit 2-year	30	70

Percentage of part-time undergraduate enrollment in degree-granting postsecondary institutions		
Institution Type	% under 25 years old	% over 25 years old
Public 4-year	52	48
Public 2-year	55	45
Private non-profit 2-year	42	57
Private for-profit 2-year	35	64

We think of an adult as a person that is fully grown and developed but what does that really mean? What are the dangers of making generalizations about adult learners especially taking into consideration our own personal beliefs as educators? Whose con-concept of an adult learner will we use?

Andragogy is the art and science of helping adults learn and it was studied and developed by Malcolm Knowles who noticed key differences in the characteristics of young and older learners. As people mature: [11, 12]

● they become increasingly independent and self-directed (self-concept).

● they have accumulated experiences that provide a fertile resource for learning (experience).

● they are more interested in learning subjects that have immediate relevance to their jobs or personal lives (readiness to learn, relevance).

● they become more problem-centered rather than subject-centered (orientation to learning).

● they become more motivated by various internal incentives, such as need for self-esteem, curiosity, desire to achieve, and satisfaction of accomplishment (motivation to learn).

Knowles postulated that learning was lifelong and completed at specific stages. Because adults manage other aspects of their lives, they are capable of directing or, at least, assisting in the planning and implementation of their own learning. "Non-traditional learner" is the more recent moniker attributed to those in this group. Key characteristics distinguishing them from other college students is the "high likelihood that they are juggling other life roles while attending school, including those of worker, spouse or partner, parent, caregiver, and community member."[12] From andragogy other methodologies (self-directed learning, experiential learning and transformational learning) emerged which capitalize on the strengths of adult learners.

Within the last decade, due in no small part to technological advances allowing for broader dissemination, institutions and programs geared toward serving adult students have proliferated. Programs that accommodate adult students' preferences for "active learning strategies that support cognitive growth and transformational learning"[10] and "their frequent desire for highly structured learning experiences that provide a clear roadmap of teacher expectations"[13] are the most successful.

Only after many years of teaching to our diverse student population would a professor at Hostos be able to make any definitive claims regarding the effectiveness of any of these theories. But with with the support of senior faculty, college administrators and the vast resources available through the Center for Teaching and Learning, Hostos faculty can make the journey through teaching and learning a great success.

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Diana Macri is an Assistant Professor in the Dental Hygiene Unit of the Allied Health Department. Primarily trained as a dental hygienist, she earned a Master of Education degree from Baruch College in 2012 and now considers higher education her passion. An avid writer and reader, she teaches a Writing Intensive course titled "Ethics Jurisprudence and Practice Management" in addition to two other core dental hygiene courses. She believes strongly in advocacy for Hisp`anic and Latino populations, both in the oral health professions and in education. Through her work as Trustee of the Hispanic Dental Association, Governing Council member of the American Academy of Dental Hygiene and member of the Minority Affairs Advisory Committee of the American Dental Education Association, she is able to use her voice to advance these priorities. She is deeply committed to utilizing evidence based technologies and teaching methodologies which promote student success and is invigorated by working alongside the many faculty and staff at Hostos who are equally dedicated.