DOWNLOAD PDF PRINCIPLES OF COGNITIVE LEARNING THEORY

Chapter 1 : Cognitive Learning Theory - Using Thinking to Learn

Cognitive learning theory is the application of this psychology to learning. The modern popularization [3] of the cognitive approach to learning began in the mid s as an almost revolutionary reaction to the behavioral approach. [4].

Although previous research had been conducted and published in this area, Bandura described his program of research as the first to position social modeling in a context apart from the behaviorist paradigm: The foremost proponents of behaviorism, Watson and Thorndike , dismissed the existence of observational learning because, in their view, learning required performance of responses. The notion of learning by observation was too divergent to be given serious consideration. This was a durable legacy. Despite the centrality and pervasiveness of social modeling in everyday life, there was no research to speak of on modeling processes until the publication of Social Learning and Imitation by Miller and Dollard in They recognized modeling phenomena but construed them as a special case of discrimination learning. A model provides a social cue, the observer performs a matching response, and its reinforcement strengthens the tendency to behave imitatively. I found this conception wanting on the determinants, mechanisms, and scope of observational learning. We launched a program of research on observational learning as it typically occurs in the absence of reinforced performance. We tested the determinants of observational learning and the mechanisms through which it works. After receiving his PhD from the University of Iowa in his first decade of publishing focused on topics including: At the time this article was published a view of psychotherapy as a learning process was not new, or particularly unique. In the article he reviewed various principles of contemporary learning theory that might fruitfully be applied to psychotherapy, including counterconditioning, extinction, discrimination learning, reward, punishment, and social imitation. More importantly, however, he framed the central question that he himself would later answer with what is now known as social cognitive theory: In other words, violent acts could be taught simply by carrying them out in front of the child, and whether they were presented by a live model or by film made no difference. These findings were unsettling to an already apprehensive public and contributed to growing concern regarding the effects of televised violence on children Bandura, a, p. Three conditions were compared for effectiveness: These three groups were described as follows: The third group had no exposure to the models but each child was reinforced whenever he expressed moral judgments that ran counter to his dominant evaluative tendencies. Children who had shown a predominantly delayed-reward pattern displayed an increased preference for immediate and less valued rewards as a function of models favoring immediate gratification; conversely, subjects who had exhibited a marked disposition toward immediate rewards displayed an enduring increased willingness to wait for more highly valued delayed reinforcers following exposure to models displaying high-delay behavior. Research and theoretical interpretations of learning processes have focused almost exclusively on a single mode of response acquisition which is exemplified by the operant or instrumental conditioning paradigm. In this procedure the organism is impelled, in one way or another, to perform responses under specific stimulus conditions and, through differential reinforcement of spontaneously emitted variations in behavior, new response patterns are developed or existing repertoires are brought under new discriminative stimulus control. It is generally assumed that the principles governing the latter mode of response acquisition account also for social learning phenomena occurring under naturalistic conditions. He further argued that vicarious learning is a means of short-circuiting this method, and humorously employed a play on terminology to underscore the fallacy of differential reinforcement as a suitable means for acquiring certain types of skills in hazardous situations: A Case of No-Trial Learning. For the purposes of the present discussion, a vicarious learning event is defined as one in which new responses are acquired or the characteristics of existing response repertoires are modified as a function of observing the behavior of others and its reinforcing consequences, without the modeled responses being overtly performed by the viewer during the exposure period. Any learning that occurs under these limiting conditions is purely on an observational or covert basis. This mode of response acquisition is accordingly designated as no-trial learning, since the observer does not engage in any over responding trials although, as will be shown later, he may require multiple observational trials in order to reproduce the stimuli

accurately. For example, although he argued that learning can take place through observation without the observer performing any responses to be reinforced, he was not throwing out the principle of reinforcement. What he was doing was presenting a supplementary view of reinforcement based on evidence from a number of empirical studies which suggested that reinforcement, both of the classical conditioning and the operant conditioning varieties, may occur vicariously. Thus, reinforcement could be provided not only by rewarding or punishing the learner directly, but by rewarding or punishing someone else in their presence, with whom they could identify. A Case of No-Trial Learning was important for two other reasons. Second, it concluded with a challenge that set a new standard for the variables of learning theory: The study of social transmission of response patterns is necessitated by the fact that the behavioral repertoires which constitute an enduring part of a culture are to a large extent transmitted on the basis of repeated observation of behavior displayed by social models rather than by memory drums. While the learning process is essentially the same, the characteristics of the social transmitters and other interpersonal variables can greatly affect the rate, level, and types of responses that will be acquired observationally. Moreover, the efficacy of parameters established on the basis of learning in one-person situations may differ in dyadic and group situations Bandura et al. A comprehensive theory of behavior must therefore be based on experimentation involving both social and learning variables. In fact, the central claim of the theory is that most human behavior is learned in this way: Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: They are more likely to adopt modeled behavior if it results in outcomes they value than if it has unrewarding or punishing effectsâ€¦those behaviors that seem to be effective for others are favored over behaviors that are seen to have negative consequences. They can be learned not only through direct experience, but also through symbolic generalization, such as the casting of stereotypes pp. Consequent determinants are often learned through direct experience, but can also be learned through vicarious reinforcement p. Like reinforcement in direct experiential learning, reinforcement in observational learning has the same informative, incentive, and strengthening functions Bandura, b, p. However, in observational learning it is assumed that reinforcement has an antecedent influence rather than a consequent one. It follows from social learning theory that observational learning can be achieved more effectively by informing observers in advance about the benefits of adopting modeled behavior than by waiting until they happen to imitate a model and then rewarding them for it. Bandura also introduced the concept of triadic reciprocal determinism. Where the behaviorist view was one in which the environment determined behavior, social learning theory included the additional notions that a behavior also determines the environment to which a person is subjected to, and b that cognitive regulation influences both behavior and how environmental stimuli are perceived. The same ideas presented in were again published in under the name of social cognitive theory Bandura, Bandura explained the purpose behind his use of the terms social and cognitive by saying, In the more fitting appellation as social cognitive theory, the social portion of the title acknowledges the social origins of much human thought and action; the cognitive portion recognizes the influential contribution of cognitive processes to human motivation, affect, and action. By observational and vicarious learning was well known, and well supported by both empirical and anecdotal evidence. The ideas of the theory were further organized and presented a decade later in an entry for the International Encyclopedia of Education Bandura, In summary, they are as follows: The four subfunctions that govern observational learning are a attentional processes, b cognitive representational and memory processes, c the behavioral production process, and d motivational processes p. Rather, modeling influences convey rules for generative and innovative behaviorâ€¦. Four different modes of thought verification can be distinguished: These beliefs come from: Characteristics of Human Nature. While originally cast with a behavioral orientation Bandura, b , it took on a more cognitive feel in the s and early-to-mid s Bandura, ; Bandura, b; Bandura, In more recent years it has undergone another shift toward an agentic perspective of social cognitive theory Bandura, ; Bandura, b; Bandura, c and toward a psychology of human agency Bandura, b. Throughout these changes, however, the core ideas and basic assumptions of the theory as originally presented remain intact. In laboratory investigations experimenters arrange comparatively benign environments in which errors will not produce fatal consequences for the

organism. By contrast, naturalistic environs are loaded with potentially lethal consequences that unmercifully befall those who happen to perform hazardous errors. For this reason, it would be exceedingly injudicious to rely primarily upon trial-and-error and successive approximations methods in teaching children to swim, adolescents to drive automobiles, or adults to master complex occupational and social tasks. If rodents and pigeons toiling in Skinner boxes and various mazes could likewise get electrocuted, dismembered, or extensively bruised for errors that inevitably occur during early phases of learning, it is a reasonably safe prediction that few of these venturesome subjects would ever survive the shaping process. Since Bandura links to this biographical sketch from his own professional website Bandura , it seems reasonable to accept it as an accurate representation of events and attribution of importance to the publication. Phares credits Dollard and Miller as being among the first to use the term social learning and Rotter as presenting the first comprehensive social learning theory p.

Chapter 2 : Cognitive Theories Archives - Learning Theories

A learning environment in which the teacher and students work together to help everyone learn. Cognitive apprenticeship The process of having a less-skilled learner work at the side of an expert to develop cognitive skills.

The Cognitive Perspective Cognitive science is a broad, multidisciplinary term that encompasses both the human science of cognitive psychology, and the computer science of artificial intelligence and machine learning. Though in casual reference I have heard mention that the cognitive perspective is a mechanistic view of the mindâ€"one in which the head is envisioned to be full of cogs and springsâ€"this is not consistent with the historical use and linguistic root of the word. A careful reading of these articles, however, reveals that they are not about putting cogs in the mind, but rather, putting thought into the machine. In contrast, cognitive psychology is concerned with how information is represented and transformed in the brain. It is a study of perception, and of how knowledge is acquired, how it is stored, and how it is purposively used. Cognitive learning theory is the application of this psychology to learning. The modern popularization [3] of the cognitive approach to learning began in the mid s as an almost revolutionary reaction to the behavioral approach. Brown, ; Slobodin, Skinner and the misappropriation of radical behaviorist principles to language learning ; This spawned a language teaching revolution, and the U. As a result, national interest in foreign languages was revived, and educational institutions quickly adopted what came to be known as the Army or Audio Lingual Method. The method was grounded in structural linguistics and behavioral psychology, and was experienced by the learner as a practice of patterned mimicry drills. Though the method enjoyed many years of popularity it ultimately declined due to its failure to teach long-term communicative proficiency Rivers, We discovered that language was not really acquired through a process of habit formation and overlearning, that errors were not necessarily to be avoided at all costs, and that structural linguistics did not tell us everything about language that we needed to know. Chomsky , however, was very direct in pointing out that behavioral learning theory was not the answer to effective language learning. He confidently and repeatedly voices his claim to have demonstrated that the contribution of the speaker is quite trivial and elementary, and that precise prediction of verbal behavior involves only specification of the few external factors that he has isolated experimentally with lower organisms. Careful study of this book and of the research on which it draws reveals, however, that these astonishing claims are far from justified. It indicates, furthermore, that the insights that have been achieved in the laboratories of the reinforcement theorist, though quite genuine, can be applied to complex human behavior only in the most gross and superficial way, and that speculative attempts to discuss linguistic behavior in these terms alone omit from consideration factors of fundamental importance that are, no doubt, amenable to scientific study, although their specific character cannot at present be precisely formulated. The magnitude of the failure of this attempt to account for verbal behavior serves as a kind of measure of the importance of the factors omitted from consideration, and an indication of how little is really known about this remarkably complex phenomenon. The computer model of input, output, storage, and processing was quickly latched onto as a metaphor for talking about and studying human learning. Three major characteristics that distinguish the cognitive perspective from the behavioral perspective, and define its essence were stated by Howard as follows: It emphasizes knowing, rather than responding. The major emphasis is not on stimulus-response bonds, but on mental events p. It emphasizes mental structure or organization. It defines a view of the individual as being active, constructive, and planful, rather than as being the passive recipient of environmental stimulation. Although it is common to sharply contrast cognitive psychology and behavioral psychology, we believe things are not quite so simple. However, both Tolman and Hull postulated inferred entities that controlled behaviorâ€"for example, cognitive maps [7] and mediating responsesâ€¦. Influenced by the computer metaphor, cognitive psychology has created an entirely new vocabulary for discussing learning. Stimulus becomes input, behavior becomes output, and response mediators are now levels of information processing. The submission of papers for the conference gave evidence to a huge diversity of research efforts being made in several countries, all under the umbrella of cognitive research. In order to provide some semblance of structure to the report they were organized under

six general topic areas that the authors felt best represented a high-level survey of the landscape of contemporary cognitive psychology research: A more recent view was provided by Honeck, Case and Firment , who took the position that there is no paradigmâ€”i. What happens to an environmental stimulus when it is first received by the senses? Does knowledge affect perception of a stimulus? Are there different memory systems? What facilitates or hinders remembering? How is language understood? How do people recognize patterns and categorize things? What factors influence problem solving? Are cognition and emotion separable systems? What happens when people read? Are people aware of what their minds do? Even though there are no overarching, all-encompassing theories in cognitive psychology, there are many specific theories about a restricted range of phenomenaâ€”for example, short-term memory, categorization, syllogistic reasoning, and the likeâ€¦. There are also mini-theories to explain [for example] why recall is generally different than recognition, how people discover analogies between things, why people tend to overlook misspelling of the word the, why pictures tend to be remembered better than words, how mental images are constructed, what makes for an expert in physics, what young infants tend to notice, and so on. If anything, this set of mini-theories, the phenomena they address, the methods used to study the phenomena, and the assumptions brought to bear, is what characterizes the field. Based on a review of several books dealing exclusively with cognitive psychology, [9] the categorization by Lesgold , and the sample questions, mini-theories, and general points of view given by Honeck, Case and Firment ; appear to be a fair representation of the field at large. The remainder of this section will summarize contributions to cognitive learning theory, based on my own review of the literature, to provide additional perspective. Consider, for example, the experience of William K. The shift from a stimulus-response to an informational frame of reference may sound simple and straightforward in hindsight, but it was very difficult to achieve in the climate of the learning theories of the s. Behavior was the proper study of psychology; the mind was simply a subjective and fictitious entityâ€¦. During my own training as an investigator, I absorbed the prevailing frame of reference thoroughly, and, in my first theoretical paper Estes, , I subscribed wholeheartedly to the idea that laws or principles of learning could be expected to take their simples form when expressed in terms of stimulus-response relationships even while I myself was deviating from the paradigm by introducing abstract theoretical concepts not strictly definable in terms of observable stimulus or response variables. It was only many years later that I began to see the possibility that expressing laws of learning in terms of relations between behavior and observable determining conditions might not, in any significant sense, be the simplest or most parsimonious approach. Rather, the laws might take on simpler forms when expressed in terms of concepts of information or memory Estes, , â€¦. As will be apparent in subsequent chapters of this book, memory, rather than learning, was the central concept in my research and theoretical efforts from about down to the present. The popular media were deluging the public with repugnant imagery of brainwashing and the frightful scenarios of and Brave New World dominated by social engineers wielding powerful methods of behavioral control. The hit movie, A Clockwork Orange, graphically portrayed the fiendish nature of behavior modifiers physically shocking people into submission. In his movie Sleeper, Woody Allen amusingly outwits the ironclad control by despotic social engineers who reduce humans to mindless zombies. At the height of this media frenzy, I began my term as president of the APA. It seems to be more on the philosophical, rather than the practical, side of cognitive theory.

Chapter 3 : Ch. 6: PRinciples of Cognitive Learning Theory & the Constru by Angela Carlson on Prezi

The Cognitive Learning Theory explains why the brain is the most incredible network of information processing and interpretation in the body as we learn things. This theory can be divided into two specific theories: the Social Cognitive Theory (SCT), and the Cognitive Behavioral Theory (CBT).

Mayer , John Sweller , and Roxana Moreno established within the scientific literature a set of multimedia instructional design principles that promote effective learning. His longitudinal research programme over 3 years established a clear improvement in levels of student engagement and in the development of active learning principles among students exposed to a combination of images and text, over students exposed only to text. This has led some researchers to put forward the "expertise effect" as an instructional design principle unto itself. Intrinsic cognitive load is the mental effort required to perform the task itself for example, actually solving the math problem. Extraneous cognitive load is the mental effort imposed by the way that the task is delivered, which may or may not be efficient for example, finding the math problem you are supposed to solve on a page that also contains advertisements for books about math. The multimedia instructional design principles identified by Mayer, Sweller, Moreno, and their colleagues are largely focused on minimizing extraneous cognitive load and managing intrinsic and germane loads at levels that are appropriate for the learner. Examples of these principles in practice include Reducing extraneous load by eliminating visual and auditory effects and elements that are not central to the lesson, such as seductive details the coherence principle [19] [20] Reducing germane load by delivering verbal information through audio presentation narration while delivering relevant visual information through static images or animations the modality principle [21] [22] Controlling intrinsic load by breaking the lesson into smaller segments and giving learners control over the pace at which they move forward through the lesson material the segmenting principle. According to Mayer, [3] separate channels of working memory process auditory and visual information during any lesson. Consequently, a learner can use more cognitive processing capacities to study materials that combine auditory verbal information with visual graphical information than to process materials that combine printed visual text with visual graphical information. In other words, the multi-modal materials reduce the cognitive load imposed on working memory. They repeatedly found that students given multimedia with animation and narration consistently did better on transfer questions than those who learn from animation and text-based materials. That is, they were significantly better when it came to applying what they had learned after receiving multimedia rather than mono-media visual only instruction. These results were then later confirmed by other groups of researchers. The initial studies of multimedia learning were limited to logical scientific processes that centered on cause-and-effect systems like automobile braking systems, how a bicycle pump works or cloud formation. However, subsequent investigations found that the modality effect extended to other areas of learning. Empirically established principles[edit] Multimedia principle: Deeper learning is observed when words and relevant graphics are both presented than when words are presented alone also called the multimedia effect. Combining any two of these three elements works better than using just one or all three. This is especially true for walking someone through graphics on the screen, and when the material to be learned is complex or the terminology being used is already understood by the student otherwise see "pre-training". One exception to this is when the learner will be using the information as a reference and will need to look back to it again and again. Avoid using unnecessary content irrelevant video, graphics, music, stories, narration, etc. For learners with greater prior knowledge, however, some motivational imagery may increase their interest and learning effectiveness just a bit. Keep related pieces of information together. Deeper learning occurs when relevant text for example, a label is placed close to graphics or when spoken words and graphics are presented at the same time, or when feedback is presented next to the answer given by the learner. Deeper learning occurs when content is broken into small chunks. Break down long text passages into multiple shorter ones. The use of visual, auditory, or temporal cues to draw attention to critical elements of the lesson. Common techniques include arrows, circles, highlighting or bolding text, and pausing or vocal emphasis in narration. Deeper learning occurs when learners can control the rate at which they move forward

through segmented content. Some research suggests not overwhelming the learner with too many control options, however. Giving just pause and play buttons may work better than giving pause, play, fast forward, reverse buttons. Deeper learning in multimedia lessons occur when learners experience a stronger social presence, as when a conversational script or learning agents are used. The learner should have the sense that someone is talking directly to them when they hear the narration. Your learner should feel like someone is talking directly to them when they hear your narration. Also, research suggests that using a polite tone of voice "You may want to try multiplying both sides of the equation by For example, have the character narrate the lesson, point out critical features in on-screen graphics, or visually demonstrate concepts to the learner. Deeper learning occurs when lessons present key concepts or vocabulary prior to presenting the processes or procedures related to those concepts. In short, make sure learners build component models before presenting a cause-and-effect explanation of how a system works. Deeper learning occurs when lesson graphics are explained by audio narration alone rather than audio narration and on-screen text. Exceptions to this principle include: Instructional methods, such as those described above, that are helpful to domain novices or low prior knowledge learners may have no effect or may even depress learning in high prior knowledge learners. Learning theory education Good pedagogical practice has a theory of learning at its core. However, no single best-practice e-learning standard has emerged. This may be unlikely given the range of learning and teaching styles, the potential ways technology can be implemented and the ways in which educational technology itself is changing. It is a collaborative approach that opens educational content creation to a wider group including the students themselves. Role-playing and application to on-the-job settings. Interaction with other people, collaborative discovery and the importance of peer support as well as pressure. The second step involves students creating an identity online and finding others with whom to interact; online socialisation is a critical element of the e-learning process in this model. In step 3 students are giving and sharing information relevant to the course to each other. Collaborative interaction amongst students is central to step 4. Some criticism is now beginning to emerge. Her model does not easily transfer to other contexts she developed it with experience from an Open University distance learning course. It ignores the variety of learning approaches that are possible within computer mediated communication CMC and the range of learning theories that are available Moule Self-regulation[edit] Self-regulated learning refers to several concepts that play major roles in learning, and which have significant relevance in e-learning. Zimmerman [citation needed] explains that in order to develop self-regulation, learning courses should offer opportunities for students to practice strategies and skills by themselves. Moreover, Steinberg found that high-achieving students usually have high-expectation parents who monitor their children closely. Schunk argues, "students must regulate not only their actions but also their underlying achievement-related cognitions, beliefs, intentions and effects" p. Moreover, academic self-regulation also helps students develop confidence in their ability to perform well in e-learning courses. All these concepts have two aspects in common: These concepts are yet to be studied in scientific research, and stand in contrast to MOOCs. Nowadays, e-learning can also mean massive distribution of content and global classes for all the Internet users. E-learning studies can be focused on three principal dimensions: These components are people, technologies, and services. People interact with e-learning systems. E-learning technologies enable the direct or indirect interaction of the different groups of users. Technologies provide support to integrate content, enable communication, and provide collaboration tools. E-learning services integrate all the activities corresponding to pedagogical models and to instructional strategies. The complex interaction combination is the direct or indirect action with e-learning systems. At the same time, systems provide services according to the specified strategies for activities. In other words, service specifications are e-learning activities aligned with the e-learning pedagogical models and the instructional strategies". Teacher use of technology[edit] Computing technology was not created by teachers. There has been little consultation between those who promote its use in schools and those who teach with it. Decisions to purchase technology for education are very often political decisions. Most staff using these technologies did not grow up with them. Technical support for online learning, lack of access to hardware, poor monitoring of teacher progress and a lack of support by online tutors were just some of the issues raised by the asynchronous online delivery of training Davies Newer generation web 2.

Chapter 4 : Modality Principle - Cognitive Theory of Multimedia Learning

Social learning and cognitive theories put the person in a central position. Strictly behavioral conditioning models, like those we looked at last week, assume that.

This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. Abstract Learning theories are the main guide for educational systems planning in the classroom and clinical training included in nursing. The teachers by knowing the general principles of these theories can use their knowledge more effectively according to various learning situations. In this study, Eric, Medline, and Cochrane databases were used for articles in English and for the Persian literature, Magiran, Iran doc, Iran medex, and Sid databases were used with the help of keywords including social cognitive learning, learning theory, behavioral theory, cognitive theory, constructive theory, and nursing education. The search period was considered from to Some related books were also studied about each method, its original vision, the founders, practical application of the training theory, especially training of nursing and its strengths and weaknesses. Behaviorists believe that learning is a change in an observable behavior and it happens when the communication occurs between the two events, a stimulus and a response. Among the theories of this approach, Thorndike and Skinner works are subject to review and critique. Cognitive psychologists unlike the behaviorists believe that learning is an internal process objective and they focus on thinking, understanding, organizing, and consciousness. Fundamentalists believe that learners should be equipped with the skills of inquiry and problem solving in order to learn by the discovery and process of information. Among this group, we will pay attention to analyze Wertheimer, Brunner, Ausubel theories, Ganyeh information processing model, in addition to its applications in nursing education. Humanists in learning pay attention to the feelings and experiences. Carl Rogers support the retention of learning-centered approach and he is believed to a semantic continuum. At the other end of the continuum, experiential learning is located with the meaning and meaningful. It applies the minds and feelings of the person. From this group, the main focus will be on the works of Rogers and Novels. Finally, it could be concluded that the usage of any of these theoriesin its place would be desired and useful. In other words, theory is a set of related propositions, which should be able to describe, explain, predict, or control the phenomena. Learning theories have tried to provide explanations about learning and their application. It is recommended to use learning theories, single or separated or a combination in the health professions including the nursing. In most countries, including Iran, nurses are responsible for the design, implementation, and procedures for promoting health training. The nurses can use this approach in the field of self-care education to the patients. Learning theories can be used individually, group-wise or at a community level, not only for understanding and learning new things, but also for problem solving, changing the health habits, constructive communication, control emotions and affecting behavior development. As it was discussed previously, patterns can be used for applying the theories. Therefore, a series of strategies and methods should be applied. They all have a solid theoretical foundation and describe the learning environment. In fact, each model is composed of all elements of teaching including the overall goal, partial goals, behavior, content, media, methods, knowledge evaluation, and the previous knowledge of the students. By its using, it is possible to prevent the effective barriers due to inequalities resulting from social and economic status and the habit of the students to assist in learning. In this article, with the goal of reviewing the existing knowledge, the learning theories and their use in nursing education have been given an overview of the available resources in this area. Searching period was between and and the followings were also considered, a number of related books about the methods, the original vision, the founders of theories, and their practical applications, especially in education and nursing training for evaluation of strengths and weaknesses. In the article, it is emphasized on the application of the theory, especially in nursing education and the basic facts of each theory. Meanwhile, it is focused on new perspectives about the learning theories too. In preliminary searching, out of all of the obtained articles due to the title and abstract analysis, about 30 papers were excluded including intervention papers, reviewed articles, and short essays for full text and

structured reviews. Behaviorism, cognitive, and constructivism. Behaviorism Behaviorism has been the dominant approach in psychology researches. At the beginning of the 20th century, traditional behaviorists believed that learning is a change in observable behavior and it happens when the communication occurs between the two events, a stimulus and a response. They insist upon the importance of practice and repetition in learning. They believe that the final behavior would make it to repeat again. Accordingly, positive or negative reinforcement can be used to encourage the repetition of the behavior. Emotional response to an experience may be positive or negative. Bad experiences can lead to fear or anxiety. The fear and anxiety in the future similar situations, even after generalization, provoke in other situations as well such unpleasant feelings. What is known today as the transponders conditioning theory, classic or Pavlov has emerged from the researches of The Russian scientist Ivan Petrovich Pavlov and was performed at the beginning of the 20th century. Pavlov conducted his initial research works with the reflections and impact on their learning experience. For this reason, Pavlov called the unconditioned stimulus as the reinforcement and coupled it with the conditioned stimulus CS called as reinforcement. Therefore, learning will be to answer in the presence of conditioned stimuli. Upon CS repetition alone without the association of UCS, for several times will lead to the puniness of conditioned responses. Classical conditioning can remove the reactions of fearâ€”anxiety in such a way that they put a person gradually against small and light stages. Thus, it is possible to use this method for procedures of student training. One of the other proposed theories in this subset is the Thorndike theory, which is described as the selectivity or choosing a response among a set of organism available responses and transplant that respond to the driving position. Therefore, Thorndike learning method was named learning through trial and error. Thorndike quoted that it was brought him to a satisfying situation. This response is learned and in similar situations of learning is repeated by the learner again. Thus, by using the harmless trial and error method, the students will gain to the desired skills. Satisfying results will lead to its strengthening. Unpleasant results cause the students to find alternative answers through trial and error and eventually reach to the correct answer for each question. These results may be the observation of satisfied clients, the classmates, or the teacher applauded[17] One of the other main concepts of the Thorndike theory that have left an important educational effect is elements of the concept like learning transfer. Throughout the history of education, this question always has been always considered that what makes transferring our learning from one position to another. Before Thorndike investigations in this case, the psychology mentality carnal forces was to explain the phenomenon of learning transfer. It was believed that these forces could be strengthened by practicing. Students in a clinical setting encounter a number of different points, which need different combined forces. Therefore, it is comprehensive without being overwhelming to collateralize all the forces together. Skinner conditioning theory more than to be a scientific theory of learning is a set of principles and techniques, which noted to its use in different fields for administration of the humans. Skinner looked at the final result of the behavior, except that he knew the behavior as a voluntary action, which is formed by its outcome. Behavior therapy techniques are used for the treatment of psychological problems, methods for improvement, behavior modification conflicts, disorders and criminal behavior, and mental retardation. At first, the initial behaviors of each procedure are encouraged in order to implement the procedures fully. Then, they will be encouraged to fully understand and implement the correct procedures and gradually increase the distance of encouragements. Encouraging at this stage is desirable to establish and maintain behavioral conduct. Teachers can teach each procedure by giving information or clues to the student before starting the procedures. For example, they can remind them for having appropriate or expected behaviors for accessing to the desired behavior in less time. Computer programs that are designed to learn specific methods of patient care also use the same methods. First, they should perform the behavior in order to reinforce it and the whole process is time consuming and slow. Conversely, the undesirable results make the observers to refrain from that behavior. In these methods, enough attention is not paid to strengthen their intrinsic motivation. Their learning is more in the form of a response to stimuli with having excessive physical aspect and less attention to the process of thinking and critical thinking in students. Due to the Thorndike opinion, the main principles of educational providing include the clarity of objectives in education, organizing the contents from simple to complex, emphasis on the evaluation process, providing correct answers to

questions, preparing the students for learning in an orderly environment, creating a disciplined environment for training, repeating the correct answer and rewarding the learners after their correct answer to the questions. According to this law, if a behavior is done in the presence of a stimulus and achieves to the desired result, it will be a learned behavior and once the stimulus appears again, it will respond to it. Nursing staff in hospitals without prior planning are involved in many cases in the education of nursing students. In this theory, the environment is stimulating and enhancing. Consequently, its role is vital and the role of environment in learning is more than the role of heredity. Since behaviorists have based their work on the study of the observable behavior, therefore, determination of educational objectives and transforming them into accurate and behavioral goals is a fundamental duty of a teacher. The foundation of education is based on the behaviorism competence. They say that this type of learning cannot be observed directly and it is associated with the change in capacity and capability of the person to respond. Essentially, it does not immediately change the behavior. Fundamentalists believe that the students must be equipped to questioning skills and problem solving, so by exploration and information processing, they will be able to learn actively, solving and searching for new information, and reviewing their previous experiences for better understanding. Gestalt theory is known as the leader of learning cognitive theories. The psychologists of Gestalt theory are opposed to reducing convergence method, alternatively, analyzing the psychological phenomena. Therefore, due to this fact that the perception phenomena have the overall aspect, learning should be studied due to this holistic. They believed that the whole is greater than the sum of its parts and breaking the behavior into its components, generally destroy the whole concept of behavior. Wertheimer said that perception of the individual by using the principle of Pragnanz plan is structured or organized into simplest possible form in order to be able to understand its meaning. It is composed of four laws of understanding: Similarity, vicinity, relevance, and continuity. Kafka believed that these laws of understanding could be used as well as learning rules. Thus, it created the Gestalt theory of learning with insight. Their main difference with the behaviorists is in this key aspect that they believe that by the observation of behavioral responses, it would be possible to realize the nature of internal cognitive processes, which cause those answers. One of the issues highlighted by Wertheimer and other Gestalt psychologists was that memorizing like parrots is an ineffective method of learning and useless in real life. Instead, they argued that most of our learning in real life is done through understanding and the discovery of underlying issues principles. Nursing educators can use these principles in the training sessions to be seen as a whole not as a collection of discrete facts. For example, if a session is connected about the structure and function of the respiratory tract disorders such as bronchitis and the activities of daily life, the students can understand the anatomy and physiology, the disease state bronchitis , and its effect on the patient as a whole and not as the unrelated three units.

Chapter 5 : Social Cognitive Learning Theory (Albert Bandura â€“) | Principles of Learning

Learning theories are an organized set of principles explaining how individuals acquire, retain, and recall knowledge. By studying and knowing the different learning theories, we can better understand how learning occurs.

Learning Principles Theory and Research-based Principles of Learning The following list presents the basic principles that underlie effective learning. These principles are distilled from research from a variety of disciplines. Students come into our courses with knowledge, beliefs, and attitudes gained in other courses and through daily life. As students bring this knowledge to bear in our classrooms, it influences how they filter and interpret what they are learning. However, when knowledge is inert, insufficient for the task, activated inappropriately, or inaccurate, it can interfere with or impede new learning. How students organize knowledge influences how they learn and apply what they know. Students naturally make connections between pieces of knowledge. When those connections form knowledge structures that are accurately and meaningfully organized, students are better able to retrieve and apply their knowledge effectively and efficiently. In contrast, when knowledge is connected in inaccurate or random ways, students can fail to retrieve or apply it appropriately. As students enter college and gain greater autonomy over what, when, and how they study and learn, motivation plays a critical role in guiding the direction, intensity, persistence, and quality of the learning behaviors in which they engage. When students find positive value in a learning goal or activity, expect to successfully achieve a desired learning outcome, and perceive support from their environment, they are likely to be strongly motivated to learn. To develop mastery, students must acquire component skills, practice integrating them, and know when to apply what they have learned. Students must develop not only the component skills and knowledge necessary to perform complex tasks, they must also practice combining and integrating them to develop greater fluency and automaticity. Finally, students must learn when and how to apply the skills and knowledge they learn. As instructors, it is important that we develop conscious awareness of these elements of mastery so as to help our students learn more effectively. Learning and performance are best fostered when students engage in practice that focuses on a specific goal or criterion, targets an appropriate level of challenge, and is of sufficient quantity and frequency to meet the performance criteria. Students are not only intellectual but also social and emotional beings, and they are still developing the full range of intellectual, social, and emotional skills. While we cannot control the developmental process, we can shape the intellectual, social, emotional, and physical aspects of classroom climate in developmentally appropriate ways. In fact, many studies have shown that the climate we create has implications for our students. To become self-directed learners, students must learn to monitor and adjust their approaches to learning. Learners may engage in a variety of metacognitive processes to monitor and control their learningâ€”assessing the task at hand, evaluating their own strengths and weaknesses, planning their approach, applying and monitoring various strategies, and reflecting on the degree to which their current approach is working. Unfortunately, students tend not to engage in these processes naturally. When students develop the skills to engage these processes, they gain intellectual habits that not only improve their performance but also their effectiveness as learners. Skill acquisition and the LISP tutor. Self-regulation of motivation and action through internal standards and goal systems. On the self-regulation of behavior. American Journal of Physics, 50, A study of knowledge-based learning. Cognitive Science, 6, Beliefs that make smart people dumb. Goals, emotions and personal agency beliefs. The long-term retention of training and instruction pp. Interest, a motivational variable that combines affective and cognitive functioning. Integrative perspectives on intellectual functioning and development pp. Analogical thinking and human intelligence. Student Success in College: Creating Conditions That Matter. National Research Council Knowing What Students Know: The Science and Design of Educational Assessment. Brain, Mind, Experience, and School. How College Affects Students. An emerging conceptualization of epistemological beliefs and their role in learning. The Transfer of Cognitive Skill. Stereotype threat and the intellectual test performance of African Americans. Journal of Personality and Social Psychology, 69 5 , A question of belonging: Journal of Personality and Social Psychology, 92 1 ,

Chapter 6 : The principles of eLearning (cognitive theory of multimedia design) - eLearning

20 â€¢ Chapter 2: Cognitive Principles and Guidelines for Instruction 4 In the theory of communications, this leads to the "given-new principle" in conversation [Clark] and writ- ing [RedishJ].

Saul McLeod , updated Cognitive psychology is the scientific study of the mind as an information processor. Cognitive psychology became of great importance in the mids. Several factors were important in this: Disatisfaction with the behaviorist approach in its simple emphasis on external behavior rather than internal processes. The development of better experimental methods. Comparison between human and computer processing of information. The emphasis of psychology shifted away from the study of conditioned behavior and psychoanalytical notions about the study of the mind, towards the understanding of human information processing, using strict and rigorous laboratory investigation. Basic Assumptions Basic Assumptions Mediational processes occur between stimulus and response: Behaviourists rejected the idea of studying the mind because internal mental processes cannot be observed and objectively measured. However, cognitive psychologists regard it as essential to look at the mental processes of an organism and how these influence behaviour. Instead of the simple stimulus-response links proposed by behaviourism, the mediational processes of the organism are important to understand. Without this understanding, psychologists cannot have a complete understanding of behaviour. Psychology should be seen as a science: Cognitive psychologists follow the example of the behaviourists in preferring objective, controlled, scientific methods for investigating behaviour. They use the results of their investigations as the basis for making inferences about mental processes. Humans are information processors: Information processing in humans resembles that in computers, and is based on based on transforming information, storing information and retrieving information from memory. Information processing models of cognitive processes such as memory and attention assume that mental processes follow a clear sequence. Input processes are concerned with the analysis of the stimuli. Storage processes cover everything that happens to stimuli internally in the brain and can include coding and manipulation of the stimuli. Output processes are responsible for preparing an appropriate response to a stimulus. Interest in mental processes had been gradually restored through the work of Piaget and Tolman. His book Purposive Behaviour in Animals and Man in described research which behaviourism found difficult to explain. However, Tolman suggested that learning was based on the relationships which formed amongst stimuli. He referred to these relationships as cognitive maps. But it was the arrival of the computer that gave cognitive psychology the terminology and metaphor it needed to investigate the human mind. The start of the use of computers allowed psychologists to try to understand the complexities of human cognition by comparing it with something simpler and better understood, i. The use of the computer as a tool for thinking how the human mind handles information is known as the computer analogy. Essentially, a computer codes i. The idea of information processing was adopted by cognitive psychologists as a model of how human thought works. The information processing approach is based on a number of assumptions, including: Information made available from the environment is processed by a series of processing systems e. Mediational Processes The behaviorists approach only studies external observable stimulus and response behavior which can be objectively measured. In comparison, the cognitive approach believes that internal mental behavior can be scientifically studied using experiments. These are known as mediational processes because they mediate i. They come after the stimulus and before the response. In it he reported observations which suggested that animals could show insightful behaviour. He rejected behaviourism in favour of an approach which became known as Gestalt psychology. Norbert Wiener published Cybernetics: Ulric Neisser publishes "Cognitive Psychology", which marks the official beginning of the cognitive approach. Cognitive approach highly influential in all areas of psychology e.

Chapter 7 : Learning theories application in nursing education

In cognitive learning theories, learning is described in terms of information processing. In a nutshell, when we receive external data, our minds process it, discard it, or store it. Information is processed initially in working memory (WM).

What are the psychological states that children pass through at different points in their development? What are the mechanisms by which they pass from one state to another? Piaget proposed that children progress through an invariant sequence of four stages: Being controlled by the logical structures in the different developmental stages, learners cannot be taught key cognitive tasks if they have not reached a particular stage of development. The major concepts in this cognitive process include: Children and adults tend to apply any mental structure that is available to assimilate a new event, and they will actively seek to use a newly acquired structure. This is a process of fitting new information into existing cognitive structures Accommodation: This is a process of modifying existing cognitive structures based upon new information. Anomalies of experience create a state of disequilibrium which can be only resolved when a more adaptive, more sophisticated mode of thought is adopted. The ACT production system proposed a distinction between procedural knowledge and declarative knowledge. In ACT-R, the current goal acts as a filter to select relevant productions. There are two long-term memory stores: The knowledge in the declarative memory, i. At the symbolic level, chunks are structured as a semantic network. On the other hand, the knowledge in the procedural memory is represented as production rules in forms of condition-action pairs, in which the flow of control passes from one production to another when the actions of one production create the conditions needed for another production to take place. It is these production systems that provide the basis for a unitary theory of cognition. The selected production and the current goal will influence together the retrieval of information via their connections to declarative memory. Hierarchically organized goal structures are used to represent plans of action, and to control the course of cognitive processing. The acquisition of a cognitive skill is a progressive process from cognitive stage to the autonomous stage, which, in terms of the ACT-R theory, is the transformation from declarative knowledge to procedural knowledge. The process starts with the interpretive application of declarative knowledge in the cognitive stage. Then it proceeds to compile declarative knowledge into production rules during the associative stage. Gradually the production, a set of condition-action rules, becomes increasingly fine-tuned. During the autonomous stage, the effort required by condition-action rules continually decrease. At the beginning of the process of skill acquisition, new information enters in declarative form. In this stage, learners learn about a set of facts relevant to the skills, such as descriptions of the procedure. The knowledge of how to carry out a procedure is declarative, as step-by-step performance statements. At this point the learners generate actions through interpretations of the verbal statements, and carefully monitor the results of the actions when they carry out each step of the procedures. The processing in this stage is conscious, deliberate, slow and requires full attention. The major development of this stage is knowledge compilation. The compilation process is aimed to produce successful procedures in order to speed up the execution of procedures, drop the verbal rehearsal and eliminate piecemeal application. During the associative stage, we have in the process of composition and proceduralization a means of converting declarative facts into production form. Composition is the process of organizing a series of actions together into a unified production. This produces considerable speedup by composing sequences of steps into one single action. Also, once the skill is proceduralized, the new integrated production no longer requires the domain specific declarative information to be retrieved into working memory. An important consequence of proceduralization is that it reduces the load on working memory, and thus achieves a great deal of efficiency. After a skill has been compiled into a task-specific procedure, the learning process involves an improvement in the search for the right production. In this stage, the procedure becomes more and more automated and rapid. The process underlying this stage is tuning. Three learning mechanisms serve as the basis of tuning: The basic function of the generalization process is to extract from different productions what they have in common. The generalization process produces broader production rules in their range of applicability. It facilitates the transfer of knowledge in a novel situation. On the contrary, the discrimination process produces

narrow production rules. The discrimination process restricts the ranges of application of productions to the appropriate circumstances. It helps identify specific conditions and multiple variants on the conditions controlling the same action. The discrimination process facilitates the development of powerful, domain specific productions. Moreover, the specificity of the condition statements can help resolve conflicts. In this stage, learners are also getting better at selecting appropriate production in a particular context. The criterion of selection is degree of strength. Each production has a strength that reflects the frequency with which the production has been successfully applied. It has also developed an explanation to the question of how people select the appropriate knowledge in a particular context Anderson, Using the rational analysis, the ACT-R theory claim Anderson, that the mind determines what knowledge is available according to its odds of being used in a particular context. In fact, the mind implicitly performs a Bayesian inference to calculate these odds by keeping track of general usefulness and combining this with contextual appropriateness Anderson, The basic equation is as follows: So, the need is eliminated to maintain the declarative information. A dependency is created when a person sets a goal t understand a bit of an example or instruction When this dependency goal is popped, a production rule is induced form the dependency and added to the production system. Four special slots of the dependency structure: According to Bartlett, the story is assimilated to pre-stored schemata based on previous experience. Rumelhart defined a schema as "a data structure for representing the generic concepts stored in memory. In other words, schema is an "organizing and orienting attitude that involves active organization of past experience" Driscoll, Alba and Hasher examined all schema theories and identified four major processes: It explicitly illustrates how memory and comprehension operate. One of the central issues that cognitive psychologists are interested in is mental structure. According to schema theory, the knowledge we have stored in memory is organized as a set of schemata or mental representations, each of which incorporates all the knowledge of a given type of object or event that we have acquired from past experience. Schema theory provides an account to the knowledge structure and emphasizes the fact that what we remember is influenced by what we already know. Schemata facilitate both encoding and retrieval. Moreover, the mental structures are active. Memory can be reconstructed through the integration of current experience with prior knowledge. In other words, schemata represent an active process and can change over time as a result of new experiences and learning. There are two information resources: The analysis of the sensory information coming in from the outside is known as bottom-up processing or data-driven processing because it relies on the data received via the senses. The information already stored in the memory in the form of prior knowledge influences our expectations and helps us to interpret the current input. This influence of prior knowledge is known as top-down or conceptual-driven processing. Schemata operate in a top-down direction to help us interpret the bottom-up flow of information from the world. Research on functions of the schema focused on the impact of prior knowledge on comprehension and memory Driscoll, Characteristics of schema Rumelhart and Norman list five characteristics of schema: Schema represents knowledge of all kinds from simple to complex. Schema can be linked together into related systems. A schema has slots which may be filled with fixed, compulsory values or with variable, optional values. Schema incorporates all the different kinds of knowledge we have accumulated, including both generalizations derived from our personal experience and facts we have been taught. Various schemata at different levels may be activity engaged in reorganizing and interpreting new inputs. Winn and Snyder also described the characteristics of a schema as follows: Schema as Memory Structure: Schema exists at a higher level of generality than our immediate experience with the world. Schema consists of concepts that are linked together in a proposition. Schema as Dynamic Structure: Schema is dynamic, amenable to change by general experience or through instruction, assimilation, and accommodation. Schema provides a context for interpreting new knowledge as well as a structure to hold it. The processes of schema acquisition and modification Three different processes have been proposed to account for changes in existing schemata and the acquisition of new schemata due to learning Rumbelhart and Norman, Tuning occurs when existing schemata evolve to become more consistent with experience. It involves the creation of entirely new schemata which replace or incorporate old ones. The influence to Instructional Systems Design Information Processing Theory to ISD Two key assumptions in information processing theories have great influence in the formulation of instructional principles: The

memory system is an active organized processor of information Research studies in attention and perception, such as the pattern recognition filter models of attention, and dual coding theory, have great impacts on the instructional message design both in text and visual message in order to maximize the attention and perception of the learners. Studies in the characteristics of short-term memory, such as limited space and short duration, give rise to the importance of mnemonic devices to reduce the workload of the short-term memory, information organization in chunks or smaller components to increase capacity. Also, the information processing models proposes the use of rehearsal strategies to maintain information, and content organization, such as elaboration theory, to help encode information by relating incoming information to concept and ideas already in memory. Theoretical explanations on the retention in long-term memory emphasize the effects of different conditions on levels of processing. Meaningful encoding facilitates later retrieval. Graphic representations have been particular effective in facilitating encoding and memory storage of information Prior knowledge plays an important role in learning The influence is evidenced by the use of advance organizers and any instructional strategies to strengthen activation of the existing memory structure. Also, the use of the metaphors and analogies provides instructional effectiveness.

Chapter 8 : Cognitivism principles in instruction - IDE Di Sun

Cognitive learning theory 1. COGNITIVE LEARNING THEORY 2. Basis and Focus â€¢ Basis: Principles of cognitive psychology â€¢ Focus: Role of cognitive processes in learning.

Daniel Willingham is a Harvard educated cognitive scientist who writes books and articles about how to learn and teach better. Instead, the book is divided into principles of learning. In order to make the cut, these principles needed to fulfill a strict set of scientific criteria: If any of these principles is wrong, something close to it is right. Ignoring it would be costly. Using the principles versus not using them showed a big difference in results. The final criteria was that the implications of the principle should suggest new ways of teaching and learning. The book is excellent, and I highly recommend getting a copy for yourself as Willingham explains many of the details and implications of each of these principles. I wanted to discuss each principle briefly, to share the implications it has for learning better. The book lists nine principles, but two were more related to teaching, so I omitted them here. Factual knowledge precedes skill. Knowledge is more important than imagination, because knowledge is what allows us to imagine. There is considerable research showing the importance of background knowledge to how well we learn. Without background knowledge, the kinds of insights Einstein praised are impossible. Careful studies show that having more background knowledge on a topic means we can read faster, understand more when we do and remember more of it later. This means knowledge is exponential growth , with past knowledge becoming a crucial factor in the speed at which more knowledge is acquired. Memory is the residue of thought. You remember what you think about. The problem with this principle is that knowing about it is not enough. So even if you try to pay attention to the right things, it can be easy to accidentally focus on less important details which will take precedence in memory. This is a reason why highlighting is often a lousy tactic. I recommend tactics like paraphrasing with sparse notes while reading, the Feynman technique or taking pauses during a reading session to quickly recap what you just read. These are orienting tasks that encourage you to spend more time thinking about underlying meaning, which is almost always what you want to be learning. Interestingly, this also has implications for languages. Having to come up with an image that links to the sound forces you to spend a couple seconds thinking about what the word actually sounds like. We understand new things in the context of what we already know. Abstract subjects like math, physics, finance or law, can often be hard for people to learn. The reason why is that the we learn things by their relation to other things we already know sound familiar? Willingham here suggests using many examples to ground a particular abstraction in concrete terms before moving on. I would also add that I believe people overestimate their ability to learn abstract things. As such, we tell ourselves we understand an idea without first grounding it in numerous examples or analogies. Smart learners correctly understand the brains weakness for abstraction and build scaffolding to support new ideas before they fully set. Occasionally when I recommend to students metaphors or analogies for learning a subject, they come up blank. I admit, it can be a tricky technique. The only way to become good at skills is to practice them. Additionally, some basic skills require thorough practice in order to be successful at more complicated skills. Math is an excellent example: The only way to make algebra automatic is to practice a lot of problems. Willinham suggests an alternative to repetitive practice which can be painfully dull: One study showed that those who took an algebra class showed rapid and predictable decline of their skills. Those who learned calculus. Cognition is fundamentally different early and late in training. Should you learn physics like Newton? For that matter, should you learn science like a scientist, making hypothesis, testing experiments, revising your theory to fit the data? Willingham offers substantial evidence that the answer is no. Because they are different, the learner needs to weigh them against each other. For most disciplines, understanding scientific facts is more important than scientific process, for the simple reason that scientific facts will inform our lives, but few of us will ever do scientific research. The same applies to history, philosophy and nearly any other discipline of knowledge. Another implication of this is that the ideal method for learning a subject and creating knowledge within a subject will be different. People are more alike than different in how we learn. Learning styles are bunk. There is no such thing as visual, auditory or kinesthetic learners. This is also true for every serious theory of different

cognitive styles for learning. Defending this conclusion takes a bit of thought, because to most people the idea that people learn differently is obviously true, even though research says otherwise. Part of the confusion stems from the fact that different abilities can exist while styles do not. Meaning Johnny might be really good at processing visual information and Mary might be good at processing auditory information. Play Mary a tune, and she can hum it back a week later. It suggests that if you taught the same subject to both Johnny and Mary, and played Johnny a slideshow and Mary an audiobook, they would learn better than if Johnny had listened and Mary had watched. This suggests that the ways we learn are more similar than different. Willingham also debunks holistic versus linear thinkers. My version of holistic learning is not a learning style in the sense Willingham debunks here, but a strategy and one that happens to closely correspond with the third cognitive principle listed above. The nomenclature is my mistake, owing to my being unaware of the other learning theory that used the same name at the time. Intelligence can be changed through sustained hard work. This was probably my favorite part of the entire book because it validates much of what I said here. Intelligence is partially genetic and partially environmental. Innate differences do matter and some people are born with more talent than others. However, Willingham argues that intelligence is malleable. Psychologists used to believe that intelligence was mostly genes. Twin studies and other natural experiments seemed to bear that out. Adopted children turn out more like their biological parents than their adoptive parents in many dimensions. However, now the consensus has turned far more towards nurture, rather than nature. One of the biggest pieces of evidence is the Flynn Effect , which is the observation that people, over the last century, have gotten smarter and the effect is too large to be from natural selection. Genes may have an important role in intelligence, but most of that role is played out through the environment, not independent of it. Knowledge being exponential growth means that a small initial advantage can quickly compound. However, expand that small initial advantage over thirty years and you may have someone who has done a PhD in physics and someone who stopped at high-school. However, genes only created a small headstart. Sustained hard work can help set off your own exponential growth of learning in a domain as well. In terms of my own, more informal, writing about learning, I was happy that most of the principles discussed in the book reflected my own thinking.

Chapter 9 : Seven Principles of Learning Better From Cognitive Science | Scott H Young

Bandura described his theory of social learning as being developed in a context in which "the prevailing analysis of learning focused almost entirely on learning through the effects of one's actions [with] the explanatory mechanisms [cast] in terms of peripheral association of environmental stimuli to responses" (Bandura, a, p. 55).

Incorporate concept maps and other organizing tools. Use signals to help learners recall previous knowledge. Require verbalization oral or written of new knowledge. Include rehearsal, repetition, and review of new information. Require learners to enact new knowledge in someway. I think the main principles of Cognitivism in general instruction is how to design instruction based on the events of learning process. Please see the chart below: Establishment of expectancies create levels of expectation for learning. Inform learners of objectives indicate objectives and how these will be conveyed to learners. Retrieval from long-term memory activate short-term memory and retrieving information. Stimulate recall of prior learning indicate relevant prior learning and what will be done to help students recall this knowledge. Selective perception perceive and organize content materials 2. Semantic encoding semantic encode for storage in long-term memory. Provide learning guidance indicate anticipated support and guidance to help students master or understand the content. Response generation respond to questions to enhance encoding, reinforce associations and verify interpretations. Practice with feedback phase: Elicit performance practice indicate when and how practice sessions will be structured. Reinforcement reinforce, monitor and assess performance. Provide feedback indicate what form feedback will take, when it will be provided, and a strategy for varying feedback over the course of the lesson or with learner progress. Meta-cognition retrieve content and reinforce performance. Generalization retrieve and generalize learned skills to new situations. Enhance retention and transfer indicate a strategy to help promote long-term retention of the content and assist learners in applying the content in a variety of related situations somewhat different from the learning context.