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The implication of theory of behaviourism in online learning

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Abstract
Online learning presents a set of challenges for educators that differ from face-to-face instruction. The need for incorporating pedagogical principles and learning theories for making online learning more effective can't be overemphasised. As the world over, education has adapted fast to the changing situation caused by the current pandemic, it is imperative to revisit the classical learning theories to evaluate their role in online instruction. This paper focuses on the Behaviourism theory.

Keywords: Behaviourism, Skinner, Operant Conditioning, Instructional Design

Discussion
Online learning is gaining in popularity over the last few years and it has gained greater traction in the recent time. With the emergence and spread of Covid 19 around the world, online education has trickled down to the most basic level in the schools. Teachers are exploring new methods of teaching in virtual mode and finding new ways of assessment of learning. However, they are slowly acquiring the ability to create digital content and conveying it with efficacy to the students. Instead of conducting hands-on science experiments, conducting field trips and helping students do activities and projects, everything has come to the virtual mode where students are primarily only listeners and viewers. Education is not just pedagogical acquisition but also about developing inter-personal and life skills which are built over several years. Parents look at e-learning with trepidation, imagining all kinds of negative consequences of too much of technology exposure. Research has also shown that online learning lacks in sound grounding of pedagogical principles and learning theories. Designing effective classroom instruction involves various steps of lesson planning, whether it is offline or online. It is important to consider what theoretical knowledge is looked at by the teachers while designing online instruction. This paper discusses the learning theory of Behaviourism and how it can be of great assistance in making classroom instruction effective.
Although any learning theory by itself does not offer all the answers to effective pedagogy but it does offer clarity, direction and focus throughout the instructional design process (Merrill, 2001). Likewise, Merriam and Caffarella (1999) point out that learning theories by themselves are not able to proffer any solutions but help us identify the variables which are crucial in making classroom instruction effective. Thus, understanding learning theories and properly incorporating them within the scope of instructional design is important for educators. This paper also examines the opportunities and challenges of the theory of Behaviourism for the educators.
John B. Watson (1878-1958), generally considered to be the founder and champion of modern behaviourism (Heidbreder, 1933; Hunt, 1993) believed that the schools of thought which deal with the mind were unscientific. Behaviour has always been an important material for the psychologists to study (Watson, 1924). Introspection was unreliable, conscious experiences were not directly observable and people often lacked the ability to report them precisely (Murray, Kilgour & Wasylkiw, 2000). Fundamentally, the behaviour model is derived from the stimulus and response theory of Skinner. Under this paradigm, the learner is conditioned to respond based on a stimulus. Behaviourism viewed the behaviour of

an organism as a 'black box' and thought that the 'inner processes' did not have much impact (Skinner, 1978). Behaviourism is an orientation to learning, emphasising time-controlled events and constructed environmental conditions intended to bring about particular behavioural responses (Merriam & Caffarella, 1999).

Watson (1916) thought that Pavlov's conditioning model could be extended to diverse forms of learning and personality characteristics. Through Pavlovian conditions, emotions could become attached to stimuli to produce a complex adult life. In one of his famous pronouncements, Watson (1924) said that he could train any healthy infant into a specialist and professional regardless of his inborn characteristics, genetic make-up, acumen and ancestry. Classical conditioning is a multi-step procedure that involves presenting an unconditional stimulus which elicits an unconditional response (Schunk, 1999). However, it is a complex process that is not easily understood (Rescorla, 1972). The concept is theoretically interesting and might help to explain why some social phenomena such as test failure can cause conditional emotional reactions such as stress and anxiety. Through conditioning, failure can elicit anxiety and the prevailing situation also can become conditioned stimuli. For example, students may feel anxious upon entering the examination hall.

Research subsequent to Pavlov has shown that conditioning depends less on the conditional or unconditional stimulus but more on the extent that the CS conveys information about the likelihood of the UCS occurring (Rescorla, 1976). Brewer (1974) opines that conditioning may also occur by simply telling the people that they are related. Pavlov (1927, 1928) believed that any real or imaginary stimulus can be conditioned to any kind of response. Conditioning depends primarily on the compatibility of the stimulus and response with species-specific reactions (Hollis, 1997). All organisms inherently posses the basic behavioural patterns which help them to survive in their environment but it is the process of learning which provides the ability for successful adaptation (Garcia & Garcia, 1985). Watson demonstrated the power of emotional conditioning in the well known Little Albert experiment (Watson & Rayner, 1920). Albert was an 11 months old infant who displayed no fear of a white rat. During conditioning, a hammer was struck against a steel bar when Albert tried to touch the rat. The infant felt a violent shock and fell down. This sequence was repeated. A week later, when again faced with the rat, Albert began to reach out but withdrew his hand. Tests over the next few days showed that Albert reacted emotionally to the rat's presence. When Albert was re-tested a month later, he showed a mild emotional reaction (Schunk, 2012).

It is common for the teachers to experience some dysfunctional behaviours of the students in the classroom. To bring the students focus in the classroom process, some games could be played with them. The fun activities create happy feelings which beat anxiety. Many students have stage fright which can be minimised by opening up rehearsals to everyone to watch. Habits are actually acquired dispositions which repeat earlier responses (Wood & Neal, 2007). Teachers who want students to behave well in school should link school rules with many cues. For example, 'Treat others with respect' needs to be linked with all spaces in the school, not just the classroom. By applying these rules everywhere, the students get habitual. The key to forming habits is to find the cues that initiate the action and to practice another response to these cues (Guthrie, 1952).

Behaviourists such as Mager, Skinner, Thorndike and Watson share three assumptions about the learning process. First, observable behaviour rather than the internal thought process is the focus of study, since learning manifests into a change of behaviour. This implies that there is little regard for the cognitive processes of the learner. This approach focuses entirely upon the 'what' of understanding through methods like rote-memorisation, identification and association. The second assumption of behaviourism says that learning is strictly influenced by environmental factors. The early work of Gagne was deeply influenced by behaviourists such as Skinner and Thorndike (McLeod, 2003). Gagne's (1985) research comprised multiple trials on subjects and observing them for periods of either little or no improvement in learning (Fields, 1996). The last assumption of learning based on behaviourism stresses repetition and reinforcement (operant conditioning) in order to develop desired habits. B.F. Skinner was a major contributor to operant conditioning focusing on 'positive and negative reinforcement schedules, the timing of reinforcement and avoidance behaviour (Merriam & Caffarella, 1999).

Another individual who advanced a behavioural perspective on learning was Edwin R. Guthrie (1986-1959), whose learning principles were based on associations. The key behaviours were acts and movements (Guthrie, 1940), reflected in the idea of contiguity of stimuli and responses. Guthrie (1952) posited that there is a combination of stimuli which when active can create a certain response (Guthrie, 1938). Movements are discrete behaviours that result from muscle contraction while acts are large scale movements that produce an outcome. The principle of contiguity learning implies that a certain behaviour in a given situation will be repeated when exactly the same situation recurs (Guthrie, 1959). However, at any given time, a person may be exposed to many stimuli which may not lead to any concrete associations between them and the resultant responses (Schunk, 2012). The contiguity principles also apply to memory. Verbal cues are associated with stimulus conditions or events at the time of learning (Guthrie, 1952). Guthrie (1930) rejected the notion of associations through frequency of movements. Guthrie and Horton (1946) experiment with cats was interpreted as supporting the 'all or none principle of learning'. Guthrie's position does not imply that once university students successfully write a research paper, they would have mastered the requisite skills permanently. The acts themselves may have many variations and ideally the students should be able to write research papers in different contexts and formats. To produce transfer, behaviours should be practiced in the exact situation in which they will be called for. It is not necessary that responses must be rewarded to be learned. The key mechanism is contiguity or close pairing in time between stimulus and response. Even if the response is not satisfying, a waiting without consequence could lead to learning. Guthrie (1952) disputed the Law of Effect of Thorndike because satisfiers and annoyers are effects of actions. They can not influence learning of previous connections but only subsequent ones. Rewards might help in preventing forgetting because new responses will not be associated with stimulus cues. Similarly, punishment will produce unlearning only if it

causes some new learning. Contiguity is a central feature of school learning. For example, flashcards help students learn mathematical facts, foreign language words or chemical symbols.

Guthrie (1952) identified three methods of altering habits - threshold, fatigue and incompatible response. In the threshold method, the push for changing a habit is introduced at a very low level which does not lead to any perceived response. Gradually, the intensity of stimulus is increased to its full strength. For instance, some activity which is disliked by the students can be introduced gradually into the regular teaching for the students to enjoy. However, it shouldn't reach a point where students become frustrated or bored. When a stimulus is introduced at full intensity and an individual performs the undesired response, he becomes exhausted, illustrating the fatigue method. Another example is to make a student run around the school ground to his heart's content so that the child gets tired and stops running around in the class. Fatigue will take the novelty of the act away. Finally, the stimulus becomes a cue for not performing the response at all. In the incompatible response method, the provocation for the undesired behaviour is combined with a response that is incompatible with the undesired response. This means that the two responses can not be performed simultaneously. The response to be paired with the cue must be more attractive to the individual than the undesired response (Guthrie, 1952). For instance, reading and talking can not take place simultaneously. However, punishment is ineffective in altering habits, it can only suppress it. Some students get more charged up by the threat of punishment which makes them look like a class hero, which can bolster the same habit which the teacher wanted to break. It is better to alter negative habits by replacing them with desirable ones (i.e., incompatible responses).

A well known behavioural theory is 'Operant Conditioning', formulated by B.F. Skinner. His theory has been applied to the processes of school learning, class discipline, child's growth and development and language acquisition (DeGrandpre, 2000; Karoly &Harris, 1986; Morris, 2003). Despite his admission that he failed as a writer because he had nothing important to say, Skinner was a prolific writer, with his scientific writing spanning six decades. He posited that cause and effect relationships in behaviour are the laws of a science. Learning is like the rearranging of responses in a complex situation which results from reinforcement (Skinner, 1953). We might think of operant behaviour as 'learning by doing' and in fact much learning occurs when we perform behaviours (Lesgold, 2001). Reinforcers (rewards) do not depend upon mental processes of a child such as intentions or goals (Schultz, 2006). To check if a given event is reinforcing to someone, then a direct test needs to be given (Skinner, 1953). Reinforcers are situation specific, applying to individuals at given times under given conditions. For instance, what is seen as reinforcing to a particular student during reading may not happen during music practice. However, students typically find teacher appreciation, free time, play time, special privileges, stickers etc as reinforcers for good behaviour. Negative reinforcement involves removing a stimulus or taking some benefit away which may increase the chances of the response to occur in that situation. Criticism, annoying behaviour, low grades etc act as negative reinforcers. Skinner (1953) also gave the concept of extinction which involves the decline of response due to non-reinforcement. Students who raise their hand to answer in the class but never get asked by the teacher, may stop raising their hand in future.

Premack (1962, 1971) described a means for ordering reinforcers that allowed one to predict reinforcers. The Premack Principle says that the opportunity to engage in a more valued activity reinforces engaging in a less valued activity where value is defined as the time spent on an activity and the benefits it brings. An increase in activity will take place in the probability of receiving a benefit (rewards). The expectation of punishment, on the other hand, will lead to a decrease in the activity. One of the examples of applying Premack Principle by a teacher is to tell a child that you can go for playing after you have finished reading the book. Another example is to tell the child that his recess period is curtailed till the misbehaviour stops. However, punishment also conditions responses in a child to escape punishment by doing activities that are expected of him. Punishment does not teach how to behave more productively. Another important aspect is that when misbehaviour gets condoned by the teacher sometimes and reprimanded at others, it can lead to confusion in the child such that he doesn't get to understand what is appropriate and what is not. Variable behaviour can cause fear, anger, crying etc. There are many empirical evidences that support Premack's ideas, especially pertaining to the reward assumption (Dunham, 1977). Teachers who employ the Premack principle need to observe a child's preference periodically. A program of behavioural change can be implemented when reinforcers are identified (Timberlake & Farmer-Dougan, 1991). Another alternative is to allow the misbehaving child to continue with his acts till fatigue sets in. One more alternative is to to ignore the unwarranted behaviour. Yet another practice is to condition incompatible behaviour with positive reinforcement. Teacher praise for productive work habits helps condition those habits. The advantage to this alternative is that the student learns to behave adaptively (Schunk, 2012).

A systematic application of behavioural learning principles can facilitate adaptive behaviours (Ullmann & Krasner, 1965) which can be used for treating subject phobias, dysfunctional language, disruptive behaviours and low self control among children (Ayllon & Azrin, 1968; Becker, 1971; Keller & Ribes-Inesta, 1974). For example, if a student keeps pushing and shoving the class fellows, the teacher can tell him that he can get the opportunity to stay ahead in line only when he stays in line. It can start initially for short distances and then for progressively longer distances, until the child begins to behave properly in line for any distance. The basic technique involved here is reinforcement of desired behaviours and extinction of undesired ones. Punishment is rarely used but when used, it entails removing a positive reinforcer instead of presenting a negative reinforcer. In deciding on a program of change, behaviour modifiers typically focus on the following three issues (Ullman & Krasner, 1965):

a) Which behaviours are maladaptive and which ones should be increased or decreased?
b) What are the environmental contingencies that support the individual's behaviour?
c) What environmental factors can be altered to change the individual's behaviour?

There are critics though, who argue that behaviour modification shapes quiet and docile behaviours (Winett & Winkler, 1972). A quiet classroom at all times does not lead to effective learning since some noise from social interactions would facilitate learning. Quiet classrooms only lead to withdrawn children. Clearly, the goals for behaviour modification need to be thought out carefully by those implementing the procedures. Skinner (1938, 1953, 1954, 1978) wrote extensively on how his ideas can be applied for solving educational problems. He believed that there was too much of aversive control in schools. Students work on assignments not because they enjoy them necessarily but to avoid punishment, such as teacher criticism, loss of privileges, and a trip to the principal's office. Corrective feedback in most of the classrooms is not given in time. Teacher may take days to give her feedback on assignments by which time students may continue to learn incorrectly. Besides, students don't learn at the same pace. Even before every student has learnt a given concept, the teacher may move on to the next topic since there is a lot of curriculum to be covered. Skinner (1978) believed that teaching required presenting the learning material in small measures, learners actively participating rather than passively listening, teacher giving feedback immediately rather than later and learners moving through the curriculum at their own pace.

Even in the report cards issued by the schools, there could be very ambiguous objectives like 'improve student awareness' which had better be replaced with something more specific. Conversely, objectives that are too specific and document even minute change in student behaviour may also be self defeating. Teacher must not lose sight of the most important learning outcomes in this nitty-gritty. Optimal objectives fall somewhere between the two extremes (Schunk, 2000). One of the common examples of a teacher objective is 'Students go to activity classes in an orderly fashion'. It would be much better to write that 'Students move for activity classes by walking in a line without pushing or shoving the others'. Research shows that students given behavioural objectives have better verbatim recall of verbal information compared with students not provided with objectives (Faw & Waller, 1976). Objectives help them to process the information at the appropriate level. Also, Muth et al. (1988) found that how a text is structured can also moderate the effect of objectives on learning. Information that is early in a text or is highlighted or bold is recalled much easily.

Conclusion

Behaviourism, helps in understanding learning in terms of environmental events. Only mental processes are not enough in acquiring, maintaining and generalising behaviour for learning. The learning theories of Thorndike, Pavlov and Guthrie are of historical importance to view learning as a process of forming association between stimuli and responses. Thorndike believed that when there are satisfying consequences, responses to stimuli are strengthened. Pavloc demonstrated that stimuli could be conditioned to elicit responses by being paired with other stimuli. Guthrie hypothesised that relation between stimulus and response can establish their pairing. These theories and the research they generated further helped in establishing the field of learning as a legitimate area of study. Operant conditioning - the learning theory formulated by B. F. Skinner is based on the assumption that stimuli, situations and events act as cues for responding. It is not necessary to refer to underlying physiological or mental states to explain behaviour. Operant principles have been applied to many aspects of teaching and learning, facilitating student achievement. It's time the theory is incorporated in the current situation of online learning too.

References

1. Ayllon, T., & Azrin, N. (1968). The token economy: A motivational system for therapy and rehabilitation. New York: Appleton-Century-Crofts
2. Becker, W. C. (1971). Parents are teachers: A child management program. Champaign, IL: Research Press
3. Brewer, W. F. (1974). There is no convincing evidence for operant or classical conditioning in adult humans. In W. B. Weimer & D. S. Palermo (Eds.), Cognition and the symbolic processes (pp. 1–42). Hillsdale, NJ: Erlbaum.
4. DeGrandpre, R. J. (2000). A science of meaning: Can behaviorism bring meaning to psychological science? American Psychologist, 55, 721–739.
5. Dunham, P. (1977). The nature of reinforcing stimuli. In W. K. Honig & J. E. R. Staddon (Eds.), Handbook of operant behavior (pp. 98–124). Englewood Cliffs, NJ: Prentice Hall.
6. Faw, H. W., & Waller, T. G. (1976). Mathemagenic behaviours and efficiency in learning from prose materials: Review, critique and recommendations. Review of Educational Research, 46, 691–720.
7. Fields, Dennis. (1996). The Impact of Gagne's Theories on Practice. 1996 National Convention of the Association for Educational Communications and Technology. Indianapolis, IN: AECT.
8. Gagné, R. M. (1985). The conditions of learning (4th ed.). New York: Holt, Rinehart & Winston.
9. Garcia, J., & Garcia y Robertson, R. (1985). Evolution of learning mechanisms. In B. L. Hammonds (Ed.), Psychology *and learning: Master lecture series* (Vol. 4, pp. 191–243).
10. Guthrie, E. R. (1930). Conditioning as a principle of learning. Psychological Review, 37, 412–428.
11. Guthrie, E. R. (1938). The psychology of human conflict. New York: Harper & Brothers.
12. Guthrie, E. R. (1940). Association and the law of effect. Psychological Review, 47, 127–148.
13. Guthrie, E. R. (1952). The psychology of learning (Rev. ed.). New York: Harper & Brothers.
14. Guthrie, E. R. (1959). Association by contiguity. In S. Koch (Ed.), Psychology: A study of a science (Vol. 2, pp. 158–195). New York: McGraw-Hill.
15. Guthrie, E. R., & Horton, G. P. (1946). Cats in a PUZZLE box. New York: Rinehart & Company.
16. Heibreder, E. (1933). Seven psychologies. New York: Appleton - Century - Crofts.
17. Hollis, K. L. (1997). Contemporary research on Pavlovian conditioning: A "new" functional analysis. American Psychologist, 52, 956–965.
18. Hunt, M. (1993). The story of psychology. New York: Doubleday.
19. Karoly, P., & Harris, A. (1986). Operant methods. In F. H. Kanfer & A. P. Goldstein (Eds.), Helping people change: A textbook of methods (3rd ed., pp. 111–144). New York: Pergamon.

20. Keller, F. S., & Ribes-Inesta, E. (1974). Behavior modification: Applications to education. New York: Academic Press.
21. Lesgold, A.M. (2001). The nature and methods of learning by doing. American Psychologist, 56, 964–973.
22. McLeod, G. 2003. "Learning Theory and Instructional Design."Learning Matters 2: 35-53.
23. Merriam, S. B. & Caffarella, R. S. (1999). Learning in Adulthood: A Comprehensive Guide. (2nd Edition). San Francisco: Jossey-Bass.
24. Merrill, M. David. (2001). Components of Instruction Toward a Theoretical Tool for Instructional Design. Instructional Science, 29,291-310.
25. Morris, E. K. (2003). B. F. Skinner: A behavior analyst in educational psychology. In B. J. Zimmerman & D. H. Schunk (Eds.), Educational psychology: A century of contributions (pp. 229–250). Mahwah, NJ: Erlbaum.
26. Murray, D. J., Kilgour, A. R., & Wasylkiw, L. (2000). Conflicts and missed signals in psychoanalysis, behaviorism, and Gestalt psychology. American Psychologist, 55, 422–426.
27. Muth, K. D., Glynn, S. M., Britton, B. K., & Graves, M. F. (1988). Thinking out loud while studying text: Rehearsing key ideas. Journal of Educational Psychology, 80, 315–318.
28. Pavlov, I. P. (1927). Conditioned reflexes (G. V. Anrep, Trans.). London: Oxford University Press.
29. Pavlov, I. P. (1928). Lectures on conditioned reflexes (W. H. Gantt, Trans.). New York: International Publishers.
30. Premack, D. (1962). Reversibility of the reinforcement relation. Science, 136, 255–257.
31. Premack, D. (1971). Catching up with common sense or two sides of a generalization: Reinforcement and punishment. In R. Glaser (Ed.), The nature of reinforcement (pp. 121–150). New York: Academic Press.
32. Rescorla, R. A. (1972). Informational variables in condition- ing. In G. H. Bower (Ed.), The psychology of learning and motivation (Vol. 6, pp. 1–46). New York: Academic Press.
33. Rescorla, R. A. (1976). Pavlovian excitatory and inhibitory conditioning. In W. K. Estes (Ed.), Handbook of learning and cognitive processes (Vol. 2, pp. 7–35). Hillsdale, NJ: Erlbaum.
34. Schunk, D. H. (1999). Social-self interaction and achievement behavior. Educational Psychologist, 34, 219–227.
35. Schunk, D. H. (2000). Learning theories: An educational perspective (3rd ed.). Upper Saddle River, NJ: Merill/Prentice Hall.
36. Skinner, B. F. (1938). The behavior of organisms. New York: Appleton-Century-Crofts.
37. Skinner, B. F. (1953). Science and human behavior. New York: Free Press.
38. Skinner, B. F. (1954). The science of learning and the art of teaching. Harvard Educational Review, 24, 86–97.
39. Skinner, B. F. (1978). Reflections on behaviorism and society. Englewood Cliffs, NJ: Prentice Hall.
40. Timberlake, W., & Farmer-Dougan, V. A. (1991). Reinforcement in applied settings: Figuring out ahead of time what will work. Psychological Bulletin, 110, 379–391.
41. Ullmann, L. P., & Krasner, L. (1965). Case studies in behavior modification. New York: Holt, Rinehart & Winston.
42. Watson, J. B. (1916). The place of the conditioned-reflex in psychology. Psychological Review, 23, 89–116.
43. Watson, J. B. (1924). Behaviorism. New York: Norton.
44. Watson, J. B., & Rayner, R. (1920). Conditioned emotional re- actions. Journal of Experimental Psychology, 3, 1–14.
45. Winett, R. A., & Winkler, R. C. (1972). Current behavior modification in the classroom: Be still, be quiet, be docile. Journal of Applied Behavior Analysis, 5, 499–504.
46. Wood, W., & Neal, D. T. (2007). A new look at habits and the habit-goal interface. Psychological Review, 114, 843–863.