

Is behaviourism really dead? A scoping review to document the presence of behaviourism in current medical education

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Abstract

Behaviourism is the underpinning learning theory of many teaching and assessment tools utilised to enhance the effectiveness of learning. Feedback, reinforcements, motivation, learning outcomes and objectives are a few among many which are implied by the medical teachers while teaching both basic and clinical sciences to students. The claim of behaviourism being redundant or dead is not based on realities. The behaviourist approach is and will remain the most powerful theory to be implied in educational processes for gaining successful outcomes.

Keywords: Behaviourism, Implications, Medical education, Dead, Learning.

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Introduction

Although a lot of evidence exists regarding the use of behaviourist approach (BA) in teaching and learning (T&L) but the weight of evidence fall towards its extinction as a practical approach.¹ In contrast to what most of the literature says, a lot of behaviourist-based T&L approaches still exist and are in fact very beneficial. The foremost underlying reasons for calling BA dead or abandoned seems to be a blind following of zeitgeist, and an incomplete understanding of BA which includes a lot of varieties, like methodological, radical, analytical and psychological behaviourism etc.² These reasons, along with the contemporary rise of other educational paradigms, led to the downfall of BA in literature. But for all practical purposes, BA remained steadfast and the most basic assumptions of all the theories of BA i.e. stimulus leads to a response which can be conditioned and altered by appropriate reinforcement, remains the mainstay of all instructional designs.³ Further information had been added between these two points, and the reinforcement, rewards and punishments might have been given different names or definitions, but the start and the end remain the same for all effective T&L sessions.

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The current narrative review was planned to find the literature available on behaviourist theories using the scoping review methodology to prove the existence of BA as a living and practical approach towards T&L, and to see what modifications have been made in original theories of Behaviourism, to address the modern learners' needs, which so many educationists failed to grasp or express in their writings. The findings are expected to inform the faculty about its usefulness in certain contexts and situations where other approaches fail to work. The aim of the review was not to find who is right or wrong, but to stress the need for the multidimensionality of the education to be addressed with multidimensional approaches to make it completely holistic, meaningful and fruitful.

Methodology

The steps of Arksey & O'Malley⁴ were followed in the current scoping review. A detailed flow chart was subsequently followed (Figure-1) with specific key words (Table-1).

Results

Of the total, 5(22.7%) publications appeared in literature before year 2000, 5(22.7%) between 2000 and 2010, and 12(54.5%) were published between 2011 and 2018.

Of the total, 12(57%) publications related to the United

Table-1: Key words used for literature search.

Key words used for the literature search			
Behaviourism/ Behaviorism / radical behaviorism	Evolution of Behaviorism	Modifications in Behaviorism	History of Behaviorism
Behaviorism and medical education	Behaviourism and Education	Implications of behaviorism in education	Theories of behaviorism

Table-2: Frequency of themes present in the selected articles.

Themes	N	Yes	
			%
Overview & Critique of Behaviourist theories	19		90.5
Implications in medical education or education	16		76.2

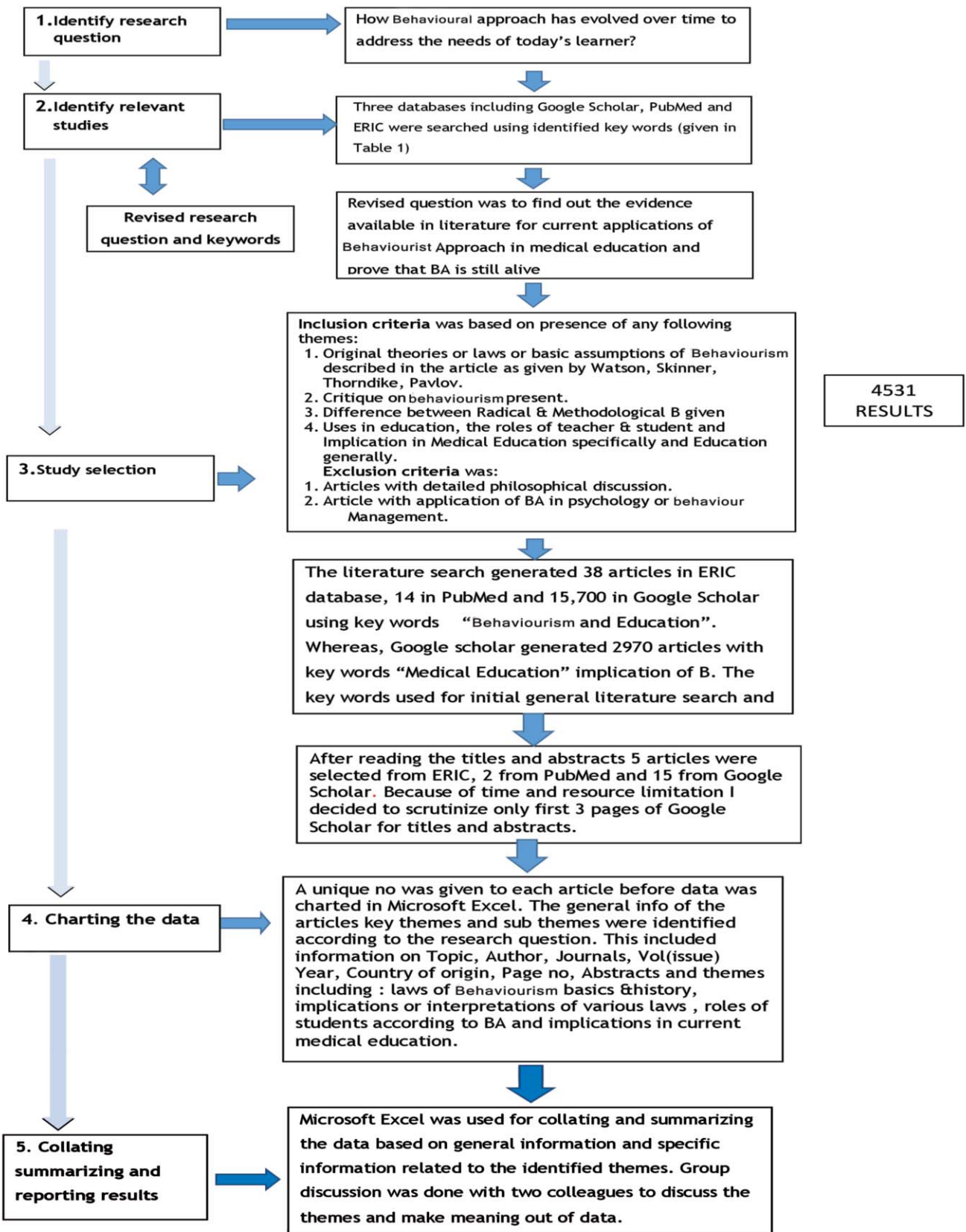


Figure-1: Study flowchart.

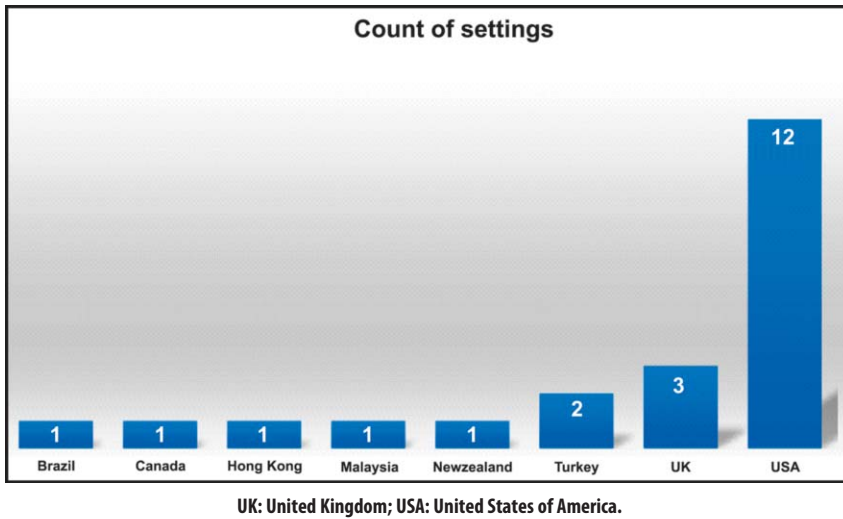


Figure-2: Countries of origin of the selected publication.

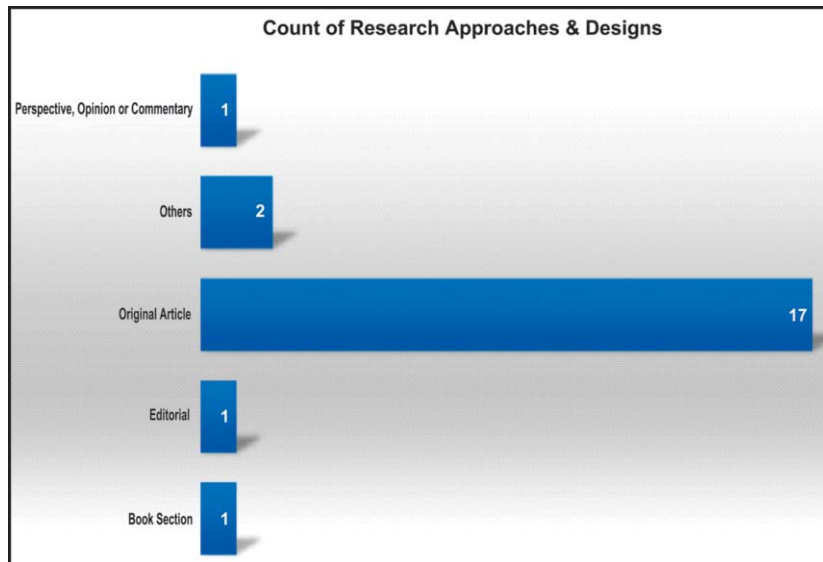


Figure-3: Types of publications selected for review.

Table-3: Frequency of Ideas of Behaviourism used in current medical education.

Feedback	5	23.8
Learning objectives, clear protocols, pre-briefing	8	38.1
Instructional design, modular learning,	3	14.3
Reinforcement theory, Law of Effect, Premack principle, incentives & rewards	14	66.7

States (Figure-2).

Of all the publications, 17(76.2%) were original articles (Figure-3).

All the publications finally selected were studied thrice

and the information was sorted into two potential themes (Table-2).

The ideas derived from Behaviourism used in medical education were grouped and tabulated under various headings using an Excel sheet. The frequency of each theme derived from Behaviourism was noted (Table-3).

Discussion

The publications identified included 19(90.4%) articles which discussed the basics of Behaviourism and responded to the critique on Behaviourism. There were 16 (76.2%) articles in which implications of BA in medical education were discussed. This short review may not be exhaustive, but it will attempt to give an overview of BA, and to answer the critiques on BA, mainly by Robbie et al.,⁵ under the headings of identified themes.

The goals of medical education are to produce a medical expert, a clinician, a researcher, a problem-solver, a leader and a manager. In addition to these goals, other versatilities that needed to be dealt with include personal and cultural diversity of the students. All the students do not have the same kind of training and background knowledge. This warrants the use of various T&L methods that are wide enough to accommodate all these diversities.

The most doable dynamics of learning are presented by the behaviourist philosophy of education. Although other philosophies have gained attention of today's educationists, behaviourist's simple, frugal and parsimonious characteristics still make it viable and practical in today's educational field.

Basic Assumptions of Behaviourism: Over the past two to three decades there is a detrimental decrease in the number of publications focused on BA in educational psychology.⁶ This decline is reciprocally related to the rise in other educational philosophies, including cognitivism, constructivism and humanism. Educational programmes based on BA gained a lot of publicity in the 1960-80 period. But by the end of the 1980s the research on behaviourism as an educational approach was minimal and those who mentioned it in their papers called it

"dead" or abandoned.⁵⁻⁷ This review aimed at revitalising this area of educational philosophy.

Behaviourism postulates that all behaviour is learned from the environment and it is observable. Learning has occurred only if one can see a change in a person's behaviour. The starting point of learning is stimulus, leading to response, and a consequence. If the consequence is satisfying, the response will be learned and strengthened, otherwise the person will respond to the stimulus in some other way until it becomes rewarding. This is called operant conditioning. The classical conditioning is stimulus leading to a response wherein the stimulus and the response can be conditioned. This classical conditioning, therefore, suggests that even the physiological responses can be altered by using the behaviourist technique. The third theory of Trial & Error communicates the active role of the learner in problem-solving which has not been tackled or seen before. In all these theories, reinforcement acts as a catalyst which promotes or demotes a behaviour or response carried out by the learner, depending upon whether it is positive or negative.⁷ One other mode of BA is modelling or learning by observation. This vicarious learning theory of behaviourism demonstrates the importance of the social environment in the process of learning.^{8,9}

Types of Behaviourism: Behaviourism has many variations among which two are more outstanding than others, namely; methodological behaviourism (MB) and radical behaviourism (RB).¹⁰ Literature search unfolds that the major critique on behaviourism is due to the confusion created by the researchers who took both varieties as one, and did not take into account the advances or modifications carried out by Skinner.¹¹ He neither considered the learners as "tabula rasa" nor as a passive recipient of the knowledge. He believed that learners are born with innate behaviours which help them to learn things in their own way. The experiments conducted by Skinner & Thorndike clearly indicated a highly active role of the learner in the learning process, like solving the puzzle in a puzzle box or finding the rule of pressing the lever to gain the advantage. He also recognised the role of "private events" in learning.¹¹

Role of Reinforcement: Researchers criticise that reinforcement used by the behaviourists were not proven as powerful as claimed by them. The reinforcement techniques are applied only to "how" of learning and it does not help in deciding the "what".⁵ This objection seems to be invalid as the "what" and "how" of learning are two entirely different aspects, and need to be addressed differently. What these researchers fail to

understand here is how a procedural solution can deal with the structural problem. Another exposition on BA is that it cannot be applied without reinforcement.⁵ Reinforcement might change its forms, but, in whatever form available, it is strongly recommended by all the educationists and researchers of past and present.¹²⁻¹⁶

They also suggest that the focus of learning should shift from reinforcement to the systematic building of skills.¹⁷ But this objection raises the questions if the change of focus from reinforcement to skill reduces its importance. Can the skill replace reinforcement? Or can the skill be taught without using reinforcement? The effective T&L and building of higher order skills can only be provided if continuous reinforcement is provided. No learning can take place without some kind of reinforcement reaching the learner and it lies at the heart of every learning endeavour. It may be provided by the teacher, facilitator, colleague, peer, student or the environment. Someone or something is always there to "push" the learner either in favour of or against learning, and tell them what is correctly learned and what is incorrect. That "push" is the reinforcement.

The validity of Behavioural Learning Objectives:

Another weakness of BA, as pointed out by the researchers, is stated as "an awkward, almost useless language for specifying objectives".⁵ This, again, is an unreasonable objection. Deciding Learning Objectives (LO), which are specific, measurable, achievable, relevant/realistic and time-bound, is the most important task while designing a curriculum. Without the knowledge of destination, how can one decide the routes and resources? There is abundant evidence proving the high relevance of making behaviourally-oriented objectives which are easy to assess and communicate to the stakeholders.^{11,16,18-22} Robbie et al. here are perplexed about the achievement of objectives related to the understanding of the concepts. They think that to achieve the LO of understanding, the learner has either to turn down to rote memorisation or to move up to the application of the concept. In both cases, the LO of understanding, in their opinion, could not be achieved. This complaint has been removed by Bloom in his works on an explanation of six levels of cognition.²³

It can also be said that the "how" of defining enabling objectives should have been told by the behaviourists. This opposition claim is very weak and is answered by themselves in the same paragraph when they say that the educationists have to use their own intellect and expertise to design the smaller steps required to attain the main target. It is so because in all the fields every content which needs to be taught to the students has different requisites to be understood and applied by the

learners depending upon its complexity and difficulty level. The person designing the LO and the curriculum should be a content expert along with an educationist to decide the size of the steps or the amount of the content to be delivered in a single encounter.

Instructional Design and Behaviourism: In the same article, the claim of Robbie et al. that BA has proven irrelevant in instructional design (ID) is also very inapt. BA is the basis for providing the foundations to almost all the ID used in today's education, including the online learning programmes. The basis comes from Skinner's operant conditioning, Watson's learning theories and Bandura's social learning theory.^{13,22,24,25}

Cognitive processes and Behaviourism

The critics of BA and those describing the transition from BA to cognitivist approach put a lot of stress on cognitive processes occurring while learning, and de-emphasise the role of reinforcement and disapprove BA's emphasis on observable behaviours and end-tasks.⁵ Does this disparagement really nullify the importance of achieving "desired behaviours" and reinforcement role in favour of learning? It will be bizarre to think in this manner as the "desired behaviours" at the end of any T&L session is all that is desired. If the focus truly shifts away from the observable and desired behaviours to the complex mental processes, no mastery can be gained in a limited amount of time we usually have. Understanding the cognitive processes may help in understanding how the learning is occurring and how it can be made more efficient, but leaving behind the LOs and thus the assessments will cause many learners to wander away and lose precious time. The mainstay of discussing this point is that the relative importance of some concepts might increase or decrease with more research, but the main constructs proposed by behaviourists are irreplaceable.

One of the other main criticisms and misunderstanding on BA is that they discard the role of cognitive or mental processes in the learning process. Skinner extended behaviourism and coined the term RB for his prepositions in which he accounted the private events including thinking and feelings as a genuine matter to be studied and experimented.^{6,26,10,27} Thus it is once again emphasised that one should keep in view the conflicting varieties of behaviourism before getting too sceptical on the approach. It would be fallacious to sweep all behaviourism with one wand.

Problem-solving and Behaviourism

One of the articles argues that the learners trained via BA will not become creative and problem-solvers and their

critical thinking ability might be compromised.²⁸ But here, again, it is argued that if a child at its initial learning stage is not taught the alphabets, would he be able to create all of them in the same manner as they exist now? The logical answer should be "no". But if someone says "yes" and hopes that the child would be both intelligent and lucky enough to create all the alphabets, how long would it take? Is it wise to waste his precious time in discovering the things already known and proven correct, useful and practical beyond doubt? If some researchers still think that the child should be given open hand and the teacher should not teach him anything so that he could go to the voyage of discovery learning, will the language he create will be understandable and acceptable to all others? Creativity and problem-solving should start after the ABCs of the field have been taught to the student which need the laws of BA to be applied in T&L. They should have a good amount of prior knowledge in their heads before embarking upon the journey of problem-solving and creativity. All theories are best, including behaviourism, if applied in the correct perspective.

Questions for Cognitivist

At this point it might be interesting to ask the proponents of cognitive revolution, who say that behaviourism is dead or abandoned, that how learning used to occur when these events were unknown; what were the starting and finishing points of any learning activity? The learning process can be defined using BA alone, but cannot be defined by using the cognitivist approach alone. They would ultimately have to borrow something from BA in order to make their points clear. BA provides a complete structural overview of the learning process, while cognitivism adds to the story by explaining in little more detail of what happens when a learner moves from preliminary behaviours to the desired behaviours.

Can We Manage Classrooms and Institutions Without Behaviourism?

James in 1978 spoke in favour of behaviourism when the so-called cognitive revolution was on the rise and the researchers were generally becoming opponents of behaviourism.¹² He and many others recognised the use of BA in classroom and school management as a necessary approach because all the teachers and faculty are answerable to higher authorities, parents of the students, and society at large. This accountability leaves little room for the purely inquiry-based learning approaches to be adopted in medical education and warrants the use of BA to achieve the stated objectives. The rules of attendance, uniforms, minimum competency-based curriculum, drill and practice of the mandatory skills, assessments and grades are all examples

of applications and connotations of BA in medical education.

Other Implications Derived from BA

Several practical applications of the laws of learning have been derived from BA. These include motivation and appropriate prior knowledge from the law of readiness, repetition and practice time for learning a skill from the law of exercise, conditioning of study behaviour and dealing with anxiety from the law of operant conditioning.²⁸

Conclusion

BA, despite stumbling upon a lot of critique, shortcomings and failing to provide answers to some situations, has remained persistent in addressing the needs of today's learner with its basic constructs along with some evolution and modifications. The paradigm may be called extinct or abandoned in theory, but for all practical purposes it remains alive and stands strong to provide a healthy, complete and meaningful learning experience to the learners.

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