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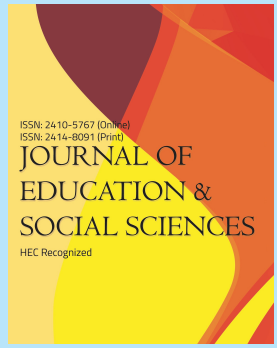

From Behaviorism to Constructivism in Teaching-Learning Process

Affiliation:
Preeta Hinduja
High School Teacher, Church Mission School, Karachi.
Email: hindujapreeta@gmail.com

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From Behaviorism to Constructivism in Teaching-Learning Process

Preeta Hinduja *

Abstract: *This paper critically examine behaviorism, a dominant philosophical orientation in existing mainstream educational institutions of Pakistan. It begins with the evolution of behaviorist paradigm and its adaptation in educational set-up. Then, discuss on the elements of behaviorism and its scope in teaching methodologies, acquisition of skills, and life-long learning processes. Then, the paper presents salient features of philosophical underpinning of constructivist paradigm (Psychological constructivism and Social constructivism) its implication in education, teaching, learning, assessment and curriculum design. While comparing both paradigms, the paper discusses how constructivism surpasses in episteme and, may help teachers to introduce new knowledge, on the basis on learners' prior knowledge and beliefs. With this, the paper concludes with the challenges in the way of paradigm shift and recommends both educators and teacher educators to take-up these challenges for initiating reforms in education.*

Keywords: Behaviorism, Education, Psychological Constructivism, Social Constructivism, Teacher educators, Educational Reforms.

Introduction

The emergence of new paradigms such as cognitive, humanism or constructivism pushed back behaviorism on several grounds (e.g. primarily focus on imitation, drilling and measurable assessment practice). However, the behaviorism is still in vogue and dominant practice in many Pakistani educational institutions.

Literature review highlights a great deal critique on behaviorist paradigm for its skewed application in teaching-learning, assessment and pedagogy. The behaviorist paradigm is grounded in stimulus-response, reinforcement and repetition; many educational institutions on Pakistan incorporate predicted learning outcomes (Stimulus-Response), rely on rote memorization (repetition), providing tangible rewards for those students who succeed in receiving knowledge from teachers' lectures (reinforcement). With this mind set, teachers largely believe in knowledge transmission methods as the safest of all methods, ignoring the cognition and significance of social construction of knowledge (Siddiqui, 2019).

On the other hand, Constructivist Philosophical orientation has wider implications in Education. Initiatives towards constructivism will shift from passive leaning to active

*High School Teacher, Church Mission School, Karachi. Email: hindujapreeta@gmail.com

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learning based on shared knowledge. Constructivist classrooms encourage participatory learning approaches. This paper represents how this new paradigm-shift has inspired global education system.

Based on literature, the paper further describes emergence of constructivism from two different schools of thoughts: Psychological constructivism and Social Constructivism. The distinctions between the two conceptions are due to different theoretical underpinning. The paper signifies each conception with relative importance in teaching specific disciplines and designing activities related to subject matter. The paper also highlights challenges for teachers in appropriate design of constructivist classrooms.

This review will help teacher educators to rethink on teacher education curriculum for improving the quality of Teacher Education (TE) and help teacher-students to prepare for 21st Century so that they could maintain a pace with global education. This will further lead production of quality knowledge and creative human resources who can potentially face un-certainties of life-world. With this, the study contributes in TE literature and constructivist pedagogy in the context of developing world.

The following sections will commence with behaviorism, the history of behaviorist paradigm, the aim and purposes and, its adaptation in classroom instructional design. Then it discusses the constructivism, its foundation and emergence in the global teaching-learning set-up. Moreover, the subsequent sections will discuss on relevance of psychological and social constructivism and describe constructivist approaches in teaching different disciplines. After that it presents the challenges and concludes with recommendation in the context of Pakistan.

Behaviorism

Behaviorist paradigm was evolved in the history after the experimental studies on animals by Pavlov, Thorndike, Watson and Skinner. Study by Pavlov made on dog popularized the notion of 'Conditioned Stimulus', while the skinner carried out his study on rats and pigeons and identified 'Operant Conditioning' that lays emphasis on stimulus-response, reinforcing and repetition. The results were generalized in educational set-up and it was thought that pupils' learning process is just a habit formation (McLeod, 2020). The driving force of paradigm is drilling (repetition); in most of the Pakistani educational institutes today, memorization is an integral part of teaching-learning processes (Mahmood et al., 2021; Siddiqui, 2019).

Drilling does not entail active thinking; the pupils merely pay attention towards reproducing texts just to achieve good grades. 'Predictability' is an important component of behaviorist philosophy, the transfer-receiving method of teachers makes Schools' managers satisfied and secure about school results. The paradigm follows lecture method, assuming students as empty containers that could be filled with 'telling method'. Application of knowledge in everyday life; attaining thinking of higher level largely found as missing component of classrooms practices. This leads to miss the broader goal of education–such as individual freedom, social justice and socio-economic development. The major downfall of this approach is that studies made on animals were applied to humans

without noticing the big differences in intelligences and effects of power and language in knowledge construction (Bereiter, 1994).

Authentic learning can only take place when students actively participate and engage in meaning making processes. This kind of learning can be attained under constructivism.

Constructivism

Richardson (2003) defines Constructivism a philosophical paradigm suggests how new learning/ meaning making process occurs among individuals. The new understanding about any concept/ phenomenon develops with the interaction of prior knowledge/beliefs individuals held. Constructivism is the descriptive rather than prescriptive theory due to it suggests the ways pupils learn, and does not mention the ways pupils should learn.

It is argued by constructivists that classroom practices of transmission model neither consider interaction of new and prior knowledge nor facilitate conversation essential in internalizing and deep learning. The acquired knowledge from traditional mode of teaching is not integrated with prior information and beliefs and, the new knowledge remains in an isolated form that is limited to school setting and just for passing examination, while this knowledge is ignored at all other times (Richardson, 2003).

Phillips (2000) defines that there are two distinct notions in to the constructivists classrooms, one that the learning not necessarily require formal educational setup; the other points that potential learning needs social milieu just as classroom environment for individual and contextual diversities. The former determines individuals as prime and sole agents in constructing and reconstructing knowledge. Within this learning paradigm it is believed that the construction is mainly idiosyncratic based on background knowledge of individuals. The development of this kind of learning fosters in social milieu when the pupils are provided platform to describe and justify their knowledge and understanding. If he/she qualifies the connections with nature/ phenomenon in acceptable manner, then this becomes a part of formal knowledge. The later paradigm considers the major influences of socio-cultural context in the acquisition of knowledge. This advocate that human construct of Knowledge is determined by influences of politics, ideology, religion, economic self-interest, maintain of status quo (p.6). These factors affect the way in understanding the world and constructing the formal knowledge. Some constructivists believe in either of one approach and some in both.

The commonalty in both approaches is that meaning making process occurs in human minds. The difference exists in the claims; the former focuses on individuals' development of shared meaning within group setting. The later maintains that formal knowledge has been created within power and socio-economic and political pressure. The integration of sociality and acknowledgement of social element such as expert's community and classroom peers play important role in knowledge construction (Richardson, 2003). The distinction is based on two different theoretical approaches – the psychological Piagetian approach to constructivism and situated social constructivist learning approaches.

Psychological constructivism

The Piagetian psychological constructivism held that the meaning making process is individualistic and the constructivist teaching would bring higher order thinking and analytical abilities. For instance, Schifter and Simon (1992) explain that the purpose of Psychological constructivist teaching in mathematics is to provide essential help in understanding the nature of mathematic inquiry and modes of knowledge generation (p.187). To acquire higher level of understanding, students' active engagement helps them to restructure their cognitive maps and reconstruct their prior knowledge. Teachers in this process provide two-way support; one by stimulating environment encourages cognitive dissonance and, secondly by formulating tasks that help in re-organizing prior cognitive maps. Mainly, this is possibly done with the application of hands-on activities that ensures active engagement; aimed at assisting pupils to challenge their thinking; ask questions to gain insight of beliefs; turn beliefs in to testable phenomenon; provide secure environment where the beliefs could be examined. But however, this kind of learning is structured into formal schools or institutes -requires social milieu that many Piagetian never cherished. Though, negotiation and discussion on shared meaning within social interface help restructure existing concepts. Bereiter (1994) supports the progressive discourse communities into classrooms a way to advance disciplinary knowledge (i.e., science, mathematics arts etc.). He further recommended that these discourse communities have potential to progress knowledge. Moreover, the post-modernist critique of psychological constructivism is that classrooms rely on text books and teachers as authoritative source of knowledge, however rare attention to curriculum and instruction is paid. Teachers select the text to be read, this however masking the: power issues, dissemination of authoritative knowledge (i.e., knowledge from textbook and teacher) and significance of formal infrastructure (O'loughlin, 1992; Bereiter, 1994). The education system that values the grade, their pupils strive to learn such things what they think their teachers expect them from the task. This form of authoritarian knowledge will be transmitted whether it is intended or not.

Apparently, these constructivist teachers believe in discovery methods, but undeniably supposed to achieve pre-determined outcomes (Edwards & Mercer, 2013).

Such controlled teaching will resist the change and lead to the maintained injustices, class-differences. For instance, the study by Edwards and Mercer (2013) in the elementary classrooms teachers believe themselves constructivists and adapt discovery based pedagogical approaches, however they supposed to achieve pre-determined outcomes and sure about what exactly their children should know. This mixed mindset teaching is confusing and vulnerable practice that would lead to marginalize powerless groups as determined by Delpit (1988), this approach is problematic give birth to unspoken misunderstanding that has serious effects. Constructivists approach is however challenging for the teachers where grades are put into priority. By and large the critique of this approach lies in unequal power relations among formal knowledge, teacher and students. This critique gives emergence to social constructivism.

Social Constructivism

Unlike Piagetian, psychological constructivist, this conception does not lay prime emphasis on individuals, rather this view social as instrumental in learning. This concept has emerged from two distinct components of learning and development: Situated cognition and Socio-cultural (Richardson, 2003).

Situated cognitive form advocates the construction of knowledge in relation to transaction with environment which is interdependent. The social milieu reinforces the actions of pupils and learning is nevertheless result of such actions. This engagement involves language that plays an essential role in the construction of meaning as said (Bredo, 1994):

> the use of language to convey and acquire ideas is an extension and refinement of the principle that things gain meaning by being used in a shared experience or joint action. . . When words do not enter as factors into a shared situation, whether overtly or imaginatively, they operate as pure physical stimulus, not as having a meaning or intellectual value (pp.15-16).

This constructivism suggests inseparability of learning from actions; the dialogical human nature encourages the amalgamation of perceptions and actions. Yet, there is no single truth that should be privileged. Diverse perspectives have utility in different contexts. Knowledge is thus neither an isolated from individuals nor something that can be received as a segregated entity. Moreover, knowledge cannot be disconnected from the activities that are useful in knowledge construction and, the community where interaction of ideas occurs. This socio-cultural notion was first introduced by Russian psychologist Lev Vygotsky (Davydov, 1995). This frame of reference suggests the role of social interaction within which cultural meaning is shared among the groups that further lead to internalize by individuals. Davydov (1995) explains Vygotsky in following words:

Developmental upbringing and teaching deals with the entire child, the child's entire activity, which reproduces in the individual socially created needs, capabilities, knowledge, and ways of behavior. This activity, if we see it as a special object of study, includes social, logical, pedagogical, psychological and physiological aspects in its unity.

Vygotsky and Scaffolding

Vygotsky's idea of Zone of Proximal Development (ZPD) highlights relationship between pupils' proximal development and tutors' instructional levels. ZPD highlights the distance between pupil's development levels when working as individual and under the guidance of More Knowledgeable Other (MKO) (p.86). This maintains the important role of teachers' instructions and peer collaboration as a guide towards attaining the proximal development. The Vygotskian concept of scaffolding refers to facilitation and supportive environment that tutors create to attain high level competence. Scaffolding has well known contribution in all the levels including kindergarten, primary, secondary and tertiary levels of education (Yin, Yang, & Li, 2020; Li & Lim, 2008; Newman, 2017; Kuiper, Smit, De Wachter, & Elen, 2017).

Essential Knowledge (reading, writing and arithmetic) derives by schooling serves as cultural tools within social interaction. Nevertheless, many schools act as separated version and the acquired subjects' knowledge do not seem applicable in everyday life. Schools are part of socio-cultural settings within which knowledge is constructed that is equally valued both in schooling and similar situations outside. Teachers following constructivism devise the tasks for students relate to students' everyday life.

Subject matter in the constructivists' classrooms

There is a not similar approach of constructivism equally for all disciplines. It depends upon the nature and characteristics of subject for instance mathematics relates with signs and symbols and the answers to certain arithmetic questions are considered either 'correct' or 'partially true', however approaches to reading and writing are highly interpretative and based on individuals' derived meaning and concepts. In these concepts there is none to consider correct or incorrect.

Constructivists' teachers no matter what discipline they are teaching formulate knowledge embedded activities in deeper and organized way. Cobb, Wood, Yackel, and McNeal (1992) compared the teaching methodology of traditional teacher with constructivist teacher, the researchers examined how teachers assess students to describe and justify the problems to the mathematical questions. It was revealed that the mathematical activities by constructivist teacher were developed more carefully. Contrarily, Freedman (1994) studied how teachers employ constructivist approaches while teaching writing skills, the researcher observed no pre-planned activities or curriculum planning, however it was noticed by teacher's framework that they intended to develop activities that cater the specific needs of pupils (p.81). The aforementioned two studies suggest how teachers differ in curriculum planning and implementation approaches in the relation to particular discipline. Hence, the subject matter has strong influences in the constructivists' classrooms.

Constructivist Pedagogy

The research on the constructivists pedagogy has begun in late 19th century. To assess the effects of pedagogy, the researchers and practitioners have started working across different domains such as mathematics, writing, history, Science, and found explicate differences between constructivists and traditional approach to teaching (Cobb & Bowers, 1999; Freedman, 1994). The modern literature has extended the significance of constructivism in business schools, in political sciences (Jung, 2019), in learning foreign languages, in psychology discipline, in devising digital teaching learning platform to help computer assisted constructivists based instructions; history and so on. The following characteristics of constructivists pedagogy are reported by above and many other researches:

1. This is student-centered approach and the pedagogy means to develop understanding of domain based on each student's background knowledge.

2. Encouragement of group dialogues to explore different elements related to domain with the intention of creation and developing shared understanding of subject matter.

3. Deliberate sharing of domain specific knowledge (either planned or often unplanned) by means of direct instructions, referring websites or texts.

4. Tasks are structured in a way they offer students to examine, challenge, add or where necessary change the prior beliefs.

5. Activities design intends to raise meta-awareness of one's own learning and understanding.

The philosophical orientation of Constructivism argued over behaviorism for its primarily emphasize on objectivity, that is world is real and external to the learner (Ertmer & Newby, 1993). Constructivism holds that Individuals create meaning contrasting to acquiring it. Thus the prediction of single correct meaning is impossible., there can be certain meanings driven from any experience. Individuals do not transmit external knowledge into their memory, instead they make interpretations of the world consistent with experiences. Therefore, the internal representation of external world and its knowledge is not similar and diversified; this suggests that reality is not objective predicted for each individual alike. Moreover, the knowledge produces in the relevant context. Thus, examining whether learning has been taken place, individuals' actual experience is required to be examined (p.54).

Though in varied disciplines, the emphasis of constructivism is building cognitive tools within existing culture which manifest individuals' experiences and insight (Ertmer & Newby, 1993). The successful and long-lasting learning incorporate three elements: Activity, concept and culture (Brown, Collins, & Duguid, 1989).

Within the complex phenomenon of teaching-learning, teacher's design need to proper match between learner, content and strategies. Teachers' role is very critical in learners' construction of knowledge. It is two-folds: provide instructions that help students construct meaning and consistently update those constructions and, to organize and design tasks that could provide the experiences of authentic and relevant contexts.

constructivists suggest that there is link between two variables (1) learners and (2) environmental factors, as learning depends upon interaction with environment. Human exhibit behaviors according to situation. For instance, the learning of new vocabulary occurs by exposure and periodic exchange of such words in the related contexts (contrary to learn meaning by using dictionary/ dictated by teacher), similarly the content knowledge needs to be understood in the situation in which it is applicable. Brown et al. (1989) suggest that both situations and cognition jointly produce the knowledge through activity (practice). Individuals' action is seen as 'interpretation of current situation based on prior experiences/interactions' (p.56).

For instance, the use of words according to the context change individuals' understanding of that, like wise the knowledge (concept) emerges with each new usage. It is

thereby argued that learning takes place in realistic setting; and that constructivist suggests chosen tasks for learning must be congruent with learners' lived experiences (Ertmer & Newby, 1993).

This person-situation interaction proves helpful in learning literacy and mathematics (usually requires open scenarios/ problem-based learning) and science. Even this interface is vital to academic motivation. Opposed with the classical viewpoints that motivation is either entire internal state or fully dependent on external environmental reinforcements, motivation is cognitive activity interlinked with socio-cultural components (for instance, teaching instructions and teachers' assistance (Schunk, 2012). To improve quality aspects of end-product of learning, the instructions should target to attain motivation. Good Instruction can enhance levels of motivation. The identification of person-situation connections helped researchers to improve learners' motivation at schools/ homes by mentoring them.

Griffin (1995) found the effectiveness of situated learning approach in acquiring map -skills among college students. The author compared tradition in-class instructions with those of the situated approach whereby learners experienced the place shown in the map. The experimental group outdid in map-skill based assessment.

Unlike behaviorists whose mainly intention is to observe and measure behaviors/students' learning from quantitative perspective of end-products (for instance how much of that much in specific time), the focus of this approach is evaluation of the qualities of output specifically in connection with individuals' qualities which then help in increasing their capacity to perform complex, interdependent and multi-dimensional tasks.

While for learning languages highlights behaviorists holds that children can produce sentences what they have heard before, however learners can make certain unlimited sentences with the application of few rules of languages as that human possess innate abilities to save, process and use information in construction of new sentences, as well as they can use linguistic skills to work on different projects. In this process teachers' instruction is instrumental, the activities in which constructivists teachers engage students are cooperative learning, project-based tasks and contextual/inter-cultural scenarios to improve holistic understanding of content with appropriate usage of vocabulary (Aljohani, 2017). Moreover, the classroom environment, where the teacher is one of the resources, not necessarily the primary source of information, engage students in metacognition by asking questions (for instance classify, analyze and create), this helps in acquiring mastery in language as well as attain creativity (p.106).

Constructivist approach prepare students how to cope with ill-defined issues. From simply knowing and recognizing facts, rules or operations (what proposed by behaviorists) to (1) applying and extrapolating to specific cases and (2) generate and testing new ideas and actions when the prevailing knowledge fails in explaining the solution of problem. In addition, the focus towards consistent engagement in reflection-in-action predicts individuals' capabilities in critically deal with unsure situations of present and future world (Ertmer & Newby, 1993).

Incorporation of Constructivism in Teacher Education

Due to its effectiveness, American teacher educators in late 20th century have shown interest to explore constructivist meaning and practices in to teacher Education Program. The ongoing symposia on constructivism highlighted three fundamentals: Research, Issues and, Policies and Practice. The progress starts primarily to prepare teachers for structuring constructivist classrooms. Embed of Constructivist learning theory was considered an essential part of teacher education Curriculum. Several models were presented before prospective and in-service teachers as guidance in the establishment of constructivist pedagogy (Richardson, 2003).

Conclusion

SDG 4 also focus on development on learners' capacities to deal with new and uncertain situation, the current pandemic and beyond also indicating the need of such development, this mandates the formulation of appropriate teaching-learning strategies that help leaners to attain full potential. The strategies design under constructivism will help to push the learners (according to their ability) from low-to-high continuum of knowledge. Rather than simply acquiring knowledge (what proposed by behaviorists), constructivists believes that the end-product is individuals' enhanced capacities in dealing with certain ill-reported problems through engagement with reflection-in-action.

The modernization demands the shift of pedagogical theory and practice from traditional paradigms that focused on quantity and objectivity to the evaluation of students' learning in terms on quality (the one that learns). With this, educationists globally have started initiatives towards constructivism, we are very much behind in moving forward with global education system. We need to revisit educational aims and go beyond the behaviorist paradigm. It is a critical time to rethink the role of teacher, student and teaching-learning processes. The process of learning requires to be built on what pupils currently know and what they need to know. This learning will take place when students will be encouraged to participate in sharing their experiences and opinions.

Constructivist classrooms entail jointly work of teachers and students in the construction of knowledge. Within this vibrant paradigm, learners' role will shift from passive recipient to active agent of learning. Within this approach, teaching strategies will offer challenging activities, which will be helpful to gradually pull learners above the existing stage of knowledge and understanding of concepts. This kind of pedagogy is inspired by Vygotsky's Scaffolding and Zone of Proximal development (ZPD); Dewey's and Piaget's notion of internalization of learning.

The constructivist paradigm has direct implications for teaching-learning processes. Within this paradigm, teachers will move beyond the transmission of knowledge and start focusing on devising activities that engage students in critical thinking and problem solving approaches. This also means restructuring classrooms that facilitate freely expression of ideas. This teaching pedagogy is surely more challenging than lecture method of teaching, but quite essential need of current time for it instill confidence and develop

positive self-image required to become an independent thinker.

It is suggested that there is need to reframe teacher education classes where teacher could able to comprehend the constructivist theory by vertical and horizontal means, this should help them to understand what constructivists approaches (Psychological/Social) could be applied in teaching specific subject matter so that they could be able to adopt appropriate strategy in their real classroom milieu. This program would entail diverse perspectives, which can be reflected and worked through (O'loughlin, 1992).

Based on the theoretical concepts mentioned in the paper, future researcher may conduct empirical studies to test the ideas. Experimental studies with control-group would help us in comparing the outcomes of constructivist against behaviorist learning approaches. Qualitative data from interviews of participants (pupils) in both groups (control and intervention) may help us comparing the quality dimension of learning (e.g., students' participation, questioning, dealing real-life situation with learned concepts). The study may conduct interview from the teachers (participants) to know what contextual challenges (based on learners, Institutional and, content related) they need to face during the intervention based on constructivism.

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