



Schema Theory as Learning Tool in Education

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Abstract

This article focuses the essential factor of learning processes and how it is being triggered through the other elements in understanding and knowing the information. Cognitive science and the schema theory and its evolution with the different concepts of memory are being discussed. In nutshell, schema theory can be used in the strategy framing and the constructive frameworks for the Teaching pedagogy. The examples from the experiments of Educational Psychologist are the lifting veil of the mystic ideologies about the learning concepts existed at present scenario.

Introduction

Sir Frederick Barlett (1886-1969) was the first experimental psychologist at Cambridge University UK. As he was a pioneer in his field of study- Cognitive psychology which provided the base for the all form of Cognitive Science. Barlett in his book Remembering 1932, his most admired work for all his successors. In this book Barlett had thrown the grand light on Schema Theory.

Barlett tried his ideas about the Schema with support of reading exercise and how we connote the meaning of the given context through the help of the previous knowledge what we have.

In this experiment, the “war of the Ghost” is the folklore text which was given as a sample test. He had spoken about the reconstructive ability of the human memory and how it connected the new information with the existing or information relevant to that in the past.

After the reading the story, barlett asked the readers to recall the story in the different interval and he asked each stage of the story with the sequences.

The timing between reading and recalling the story and the new content of the story made the recalling process tough and it was not allowing the Schemata to rewind and retrieve the details needed. The text was the having the usual form of the story telling which made them to understand and connect the link between the story and the previous experience of the readers.

As the words were not fitting into the existing schemata, it was tough for them to understand. So they had omitted the entire content of the story into tough one and couldn't understand that easily. For example the readers recalled the first half of the story. The existing schema was not matching with the new one. One participant told one instance as, the something black came out of the mouth as something foamed out of the mouth.

This experiment clearly mentioned that things happened subconsciously within the memory of the participants. In order to understand the process and memorise the information within the text, participants without realising put the new information into schema which they already had.

In the early of schema when barlett was being looked upon for what were irrelevant, But the introduction of the computers made the job easy to process the phases of any information, which are in the different folders, being with the note of future retrieval and even without that. Working of memory, in the neuroscience barlett found that the schema which has the capacity to adapt and the mould the situations and make meaning instantly. Procedural and the declarative memory are yet to be disclosed to the people, whilemean the Barlett understood this Schema.

Declarative Schema is about the world around us. For an instance if you are asked to imagine a house and all about it. Declarative memory knows what is what apart from that it helps to make us realise how to use these thing when we are encountering the content.

Cognitive Framework of Schema is being organised in the way, how we have organised our knowledge about the specific things. While we use the knowledge what we have in the given context and at the same time, we used to check the possibility of learning more from that. we can see how our existing schema influence our perception of new material (Rosenshine's Principles of Instruction).

Students derives their learning patterns from the previous learning experiences, full of previous learning experiences, how they conceive things, memories and misunderstandings, as well as thousands other associations that they never believed they possessed until they were either explained or challenged.

The main facts about the theory is R. C. Anderson, an educational psychologist, proposed schema theory in an unique way. He said that 'organized knowledge, representing ones' understanding of the world, was an elaborate network of abstract mental structures. Main principles of his theory include:

- (1) Teach general knowledge and broad concepts.
- (2) Make connections between ideas.
- (3) Prior knowledge is necessary for new knowledge.
- (4) Schema changes as new information is acquired.
- (5) Schema is organized in a meaningful way. (Anderson, 1977)

its clear from the theory that the world knowledge is fundamental for the interpretation of any discussion and it is structured in the pattern which are strong and its a stereotypic knowledge in memory.

In order to make the concept of schema more understandable and clearly, the author sums up some features of schema based on some scholars' research: they are sub-schemata, modification, relationship, also slots and variables. Of course, there are some features the author did not list. For example, Anderson also believes Schema changes moment by moment as information is received (Anderson, 1977).

David Rumelhart, in his 1977 paper [The Representation of Knowledge in Memory](#), Rumelhart postulated characteristics of schemata,

Schemata have variables

Your schema for the word "Bank" has several variables: your banking, Question Bank, Blood Bank and Banking Sector River Bank, likewise. your mind has to fix the right choice of meaning to the given context and it is determined through the situations.

Using the earlier example; within your "bank" schema, you may have a subschema "money" or "accounts" or loan. Each of these subschemata may also have embedded schema within them.

Any schemata may be accessed from any number of higher schemata. "Money" could be accessed from "Bank". This is especially important when students try to make inferences from texts or understand metaphors or analogies. Lesson plan insisting the analogies will give the scope of easy learning. Toughest concepts can be split and take with the mindmapping techniques with the sub schema which would beneficial.

All our thinking and imagining connecting the Schemata which represent a more flexible encyclopedic knowledge, rather than a fixed dictionary definition. Now a days we have different logics and understanding is given through the videos and shorts. Our mind has been more influenced by the media and the past knowledge.

Schema not only processes the given words like the dictionary but it works like the encyclopedia. So it may travel to any extent to match the known relevant details. Schema would also get to spiralling down the memory to access the movie or music. This schema also enable the ability of our students to link what they learn in the classroom to the outside world. Schemata allow mental jumps from one notion to another.

Fluidity: Assimilation or Accommodation

In his research Piaget recognized that schemas remain fluid, cognizant of new information whatever confronts it. He said that our understanding about such information in terms of schema what we have, right now in hand, whilemean we try to get information from the existing knowledge.

If a man in his eighties never think certain work is possible through the mobile phone. When we show the capability of the phone, he feels that the mobile has the magic inbuilt mechanism. The drastic growth in science has made different facilities available without much efforts, now we adjust the schema pattern about this context and comprehend the complexies with much ease.(Piaget,1923)

(<https://www.psychologistworld.com/memory/schema-memory#references.>)

We have the schema scripts for all the regular events in our life. Each activities of us are being saved with the exact flow charts.we know the activites every time we repeat we learn the new things from that and saved for the later use. So sometimes, we are in excitement or anxiety about some new instances and unanticipated events will make us stuck and distress.

Role Schema

Everyone interprets the world according to his/her knowledge and the experience whatever they have in the life. We are placed in the situtation to know the role of the certain responsible person in our family and the society. Through community, friends, book, movies and family members, we are being told about the ideal role of each person when they are in different phases of life. This makes us to understand the people or to have preconceived notions about everything we come across.

Self Schema

Our Self schemas connect us with how we perceive ourselves. The caption we have about self schema that which hold the ideas an ambitious person, our behavior will be activitated to achieve that schema - We may spin all our energy to take more risks and expect to be successful. By trimming our self schema we can shift the self-expectations of our own behavior.

Minsky's Frame Theory

Marvin Minsky (1927-2016) a cognitive scientist, was researching about artificial intelligence (AI) at the Massachusetts Institute of Technology. Minsky had made the uniqueness of Schema theory flourish cross the world otherwise it could well have been lost for good.

Minsky understood that command for machines to conceptualized and perception of the world, Every concepts in the world, indentify with the reference and it was frame of reference i.e. have the prior knowledge to link stimuli they encountered with. Through Minsky the Schema Theory has undergone a redemption and that gave rise to huge work to explore in the Cognitive Psychology.

How Cognitive Architecture helps in learning

In his 1980 research article on the Schemata the building blocks of cognition, Rumelhart disclosed the the schemata. Schemata is the hub of all sources of knowledge, what we revolve around. The ideologies to philosophy and the cultural truths, inference about the meaning of the particular to what type of excitation, we have with the particular letter of the alphabet. Inshort our schemata are our knowledge. The entire knowledge is embedded in Schemata.

After the narration of schemata and its functions. Its important to highlight the facts that the Teachers should not only give information regarding the new concepts of learning but also they have to provide the context what the students have already known.

Cognitive Load Theory

When we take the case of problem solving technique. The people who are experts in the specific domain, never wish to get the more information than they need. Hence the problem solving techniques also have impact over the people, therefore as teachers approach to provide them knowledge and must contrast according to the ability and independence of the students in front of them this will also affect resource design and looks at why domain-specific knowledge is necessary for problem-solving; you need to know facts to solve problems. Majestic statement by Sweller - solving problems definetly you never get the expertise in solving problems by solving the problems.

Conclusion

The learning graph of the students, can be improved and gauged. Though individual focus is not impossible and there are grouping methods which supports the students to be aware of the their rank in the ladder and training them are feasible. It happens in the Learning Ladder system.

Psychologists applied the term schema as the storage cabin of long-term memory those are organized and sculpted. Schemata support the connection layers of meaning making through visuals, auditory and kinesthetic ways and connection the information/facts/ideas are mapped through these representational system.

Connecting is a multi-sensory levels. well-selected visual accompaniments to complex which can help to turn the abstract and concrete and they later to make the meaning in relevance with this.

Teachers who are experts in their domain, should be able to impart aspects of these to their 'Novice' students. It is more evident that the Schema theory leverages the learning and it empowers the teaching tools and make the students understands in the expected way what are all it is required.

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