

The learner's Journey from Novice to Expert'

Farhan Vakani¹ and Mughis Sheerani²

This discussion has made a successful attempt to describe the factors that influences a learner's journey and serves as master prerequisites for becoming an expert. The factors that have been a part of familiar debate in education are namely, that of the contrast between declarative and procedural knowledge, mistakes and slips, and positive and negative transfer.

The two terms declarative and procedural knowledge many times are seen as separate, with their relationships being ignored. The term declarative knowledge is specific to different domains, such as science and mathematics declare it as conceptual knowledge and those who deal with the real-world tasks prefer to speak out it as declarative. The cognitive psychologists contrast declarative with conceptual knowledge and define it as 'knowledge of facts without any relationships among items of knowledge'. While conceptual knowledge puts the focus on relationships.

What is important within this discourse is to focus the interrelationship between the two types of knowledge, the declarative and the procedural as talked by the cognitive psychologists. The most common understanding between the two is of the contrast of 'knowing that' and 'knowing how do it'. It can also be distinguished as a contrast between the tacit knowledge and the explicit knowledge respectively. Procedural knowledge forms a significant part of expertise, and decades of researches has proven that problem solving is linked and dependent upon considerable domain knowledge i.e. declarative knowledge. Different level of procedures of complexity underpins the procedural knowledge, though the key to success is in the fact that declarative knowledge gives power to the learner to think, operate on specific procedures and include strategic skills for problem

solving. Herein the role of declarative knowledge is highly emphasized to realize the promising goal of mastery learning for all learners and to scaffold its dynamic use in procedural knowledge or problem solving. Swings and preferences of one upon the other has been noticed in different countries and internationally, but the balance between the two, declarative and procedural knowledge is recommended and favoured. The notion of errors (mistake and slip) has a strong propensity to occur during a procedure or problem solving process. Mistake occurs as a result of incorrect planning in which the intended action fails to attain the desired goal. However, a non-intended occurred action is labelled as slip. However neuropsychologists defined slips as the incorrect execution of an appropriate motor program. Both these terms mistake and slip are many times used as synonymy in colloquial language. Frequency of slips is relatively less when compared to mistakes and are mainly associated with high levels of skill. There is no doubt that error are permanent companion to human action and thought and are normally unavoidable during the learning process. The quantity and quality of errors made by an expert differs from those of a novice or an untrained person. Mistakes can take place in any of the activities with many possible reasons but the most probable among all is the information overload that creates a definite problem for the learner. Lack of attention could be the other import and association with the emergence of these mistakes and slips. The process is susceptible to errors when a high level of attention is lacking, that means the learner's attention is improperly divided between the heuristic and metacognitive parts of the problem solving process. This lack of attention in turn is influenced by the mental states (affects) of the learner, proven and discussed in many research studies. The affects namely, fear which is not a conscious emotional feeling, must have been there and represented as an emotional experience in the human working memory which implies, that due to the limited capacity of the working memory there might not be enough capacity for the facts to support the cognitive process. This explains that the attention is inclined more towards the negative emotion rather than heuristic and cognitive components, and as a consequence large numbers of mistakes or slips occur

1 Research Manager, Department of Continuing Professional Education, Aga Khan University, Stadium Road, Karachi, Pakistan.

2 Associate Professor, Department of Medicine, Aga Khan University, Stadium Road, Karachi, Pakistan.

Correspondence: Dr. Farhan Vakani, Research Manager, Department of Continuing Professional Education, Aga Khan University, Stadium Road, Karachi, Pakistan.

Email: farhan.vakani@aku.edu

during problem solving processes and, thus, decreasing the level of performance. The argument proves that both emotion and attention are closely linked and is a prerequisite for successful cognitive processes and for procedural knowledge or problem solving skills. Globally, class room practices are being modified to accommodate a more tolerant approach to mistakes and slips through encouraging self-correction and peer feedback, rather the teacher to correct all their errors. The change in practise was observed in an action research survey by William Ancker, in 15 countries. The results showed that majority of teacher participants were of the opinion that negative emotions are usually developed when discussing and treating errors with students in classroom environment, these affect occupies the place in human working memory and its arousal at the time of problem solving diverts the attention from learning or problem-solving processes, thus making successful learning less likely and decreasing the performance level.

However, training is the most important diagnostic process which aids learner in detecting errors through self-observation or diagnosed by a mentor. A good mentor is fundamental to this process that enables and provides single feedback and intelligent advice to trainee regarding the performance. However, the training regime through self-observation facilitates the learner in observing own behaviour that involve error detection and correction to improve a range of skills such as meta-perception, motor learning, etc. This method is extensively used in clinical domains and education for identifying and improving the maladaptive behaviours and mediating improved and controlled behaviours on a desired outcome, as supported by Bandura's social cognitive theory.

Consequently, the learner cannot undergo the process of problem-solving and the ends of education are not achieved unless transfer of learning or training occurs, and definitely by transfer it is all the more important; the positive transfer. Positive transfer takes place when learner's performance in one context is improved in some other context. In other words positive transfer refers to the current skills or habits that facilitates in adapting the new ones. While negative transfer is a problematic phenomenon and is of least concern in education than positive transfer and is a cause to several

errors, either slips or mistakes. Negative transfer is simply an interference or negative impact of the existing skills or habits on new learning. This horizontal transfer of learning, either positive or negative, is concerned with transfer from one task to other and clearly distinguishes from vertical transfer that refers to the transfer within a same task so that mastery of the whole task could be attained in the presence of prerequisite skills.

Study on positive transfer and negative transfer/anti-learning of problem-solving skills, by Osman has revealed that there is a strong association between the declarative and procedural knowledge for problem-solving and positive transfer. Mistakes or errors seems as the heart of this discussion and holds out the promise in the journey of mastery learning, and is defined as a permanent companion to human thought and action. Detection and correction of errors at self-generated or self-observation learning instances play a significant role in facilitating the transferability of improved knowledge and skills in complex dynamic learning environments.

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