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Intelligence and Learning: Are They Related?

Abstract

In today's corporate world, learning is one of the major aspects much talked about by the HR managers. Majority of the trainers and HR managers are still much concerned about how to make learning a fruitful job. Organizational Behaviour researchers are much concerned about the link between intelligence and learning. The present paper is an attempt to review the exiting literature on this to get a better understanding of the relationship between the two.

Keywords: Organizational Behaviour, Intelligence, Learning.

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Introduction

The two terms quite popular in schools and colleges are learning and intelligence. Teachers and academicians are putting their heads together to discuss the relationship between the two and try to figure out about the learning abilities of their students vice a versa their intelligence. In organizational context also the HR managers and the trainers are always engaged to know whether recruiting individuals of high intelligence will also help them to get employees who are good learners. With time in management literature these two terms have travelled a long distance and are much in use in different contexts.

Senge has said that learning is the most important trait a 21st century organization must have to survive and grow. Learning ability of the employees is one of the most important requisite of today's corporate world. As the role of IT is increasing concepts like e- learning are also getting prominence with time. Similarly when talked about intelligence in organizational behavioural context, terms like mental intelligence, emotional intelligence, spiritual intelligence, cultural intelligence, etc. are much heard of.

In the present study we will be concentrating on the concepts of learning and mental intelligence measured by IQ. First we will try to define the two concepts and then will also try to look at the earlier studies which have studied the two concepts together. Then we will conclude on what is the present state of affairs.

Intelligence is expressed in the ability to learn. Intelligence is manifest in the ability to acquire complicated skills and excel in performance by practice and progressive improvement.

Sternberg & Detterman (1986) felt that Intelligence has never had, and most probably never will have, a generally agreed on definition among psychologists. Many psychologists are of the opinion that intelligence is not a scientifically useful concept, because it lacks any operational meaning. On the other hand the general people and the authors not having psychology as their base define Intelligence as they feel comfortable with.

The term intelligence has emerged in ancient Greece and Jensen in his paper states that since then large number of efforts being made to scientifically define intelligence have not solved the purpose. Jensen in 1987 has detailed the long history of the concept of term intelligence and he has urged that the term intelligence be abandoned in all future scientific discussions of human abilities (Jensen 1987a).

Whatever "intelligence" or any of its synonyms may mean to psychologists or to lay persons, one thing seems certain: it does not represent any operationally knowable phenomenon and therefore is not amenable to scientific study. So there is absolutely no need for another definition of intelligence.

The concept of learning is an inference from the observation of behaviour. As per one of the definition, we say that learning has occurred when we observe a change in the probability or strength of a particular behaviour in response to a given stimulus, problem, or situation, where the change cannot be attributed to other causes such as physical maturation of

the nervous system, aging, fatigue, illness, brain damage or other physical impairment, drug effects, changes in emotional state, or changes in arousal or drive state.

The differences in learning is based on brain hemisphere dominance. Some applied researchers have suggested that our dominant brain hemisphere may play a significant role in how we learn (Ornstein, 1973). The brain's left hemisphere assimilates information in an ordered, systematic way. The process of analysis and planning is linear in structure. Accounting systems and management science quantitative models are based on rational logic. Their underlying assumption is that if data are channelled into a formula or a model, a working solution can be found. In stable environments structured and planned behaviour is likely to be effective.

Mintzberg suggests that when it comes to running the organization, planning occurs on the left side, managing on the right. He writes, "It may be that management researchers have been looking to the key to management in the lightness of logical analysis whereas perhaps it has always been lost in the darkness of intuition." The world of the right hemisphere dominant managers involves holistic, simultaneous, creative leaning.

Aim of the Study

To study the relationship between learning and intelligence.

Measurement of Learning

Learning is an important and flexible process that allows humans to adapt to their environment. A first basic source of learning is personal experience. Humans interact directly with the environment and learn from the feedback they receive. A second source of learning is observing other people interacting with the same environment. In a world where we need to adapt quickly to ever-changing circumstances (e.g., climate fluctuations, socio-political commotion), the ability to learn from others is fundamental because it allows us to foresee the consequences of our actions without experiencing them directly. However, people should be selective in which situations they rely on social learning strategy as it can be efficient in some cases and inefficient in others.

1. The measurement of learning is one of the problematic area in this field which has always bothered the scientific researchers. The quantification of learning in individuals is not as highly developed or as standardized in procedures as the technique of psychometric testing.

   Four parameters to be considered while measuring of learning are: initial level of performance on the task prior to the learning trials. It is rare that all persons begin a learning task with equal levels of performance; they are already at different points on the learning curve when training begins. Therefore it is essential that level of performance on the task be assessed before or during the first learning trial.
2. Final level of asymptote of performance at the end of practice. This can be a reliable measure of individual differences only if practice is not carried on to a level of mastery of the task for any subject in the study, or if the nature of the task is such that there is effectively no intrinsic ceiling to proficiency on the task.
3. Rate of change between the initial trial and final trial. Because a learning trial is an arbitrary unit, it is preferable to convert trials to an appropriate unit of time measurement. (Time has the advantage of a physical measurement with units constituting a ratio scale.)

   This mathematical necessity plays havoc with attempts to correlate gain scores with other variables. These psychometric and statistical problems of measuring change have been well explicated elsewhere (Cronbach & Furby 1970; Cronbach & Snow 1977).
4. Oscillation in performance level throughout the course of practice. Learning curves show a directionally consistent and smooth change in level of performance with practice only when they are group curves based on the average of a number of individual learning curves.

J.E. Ormrod (2000) has identified seven learning strategies viz. Identifying important information, Taking Notes, Retrieving relevant prior knowledge, Organizing, Elaborating, Summarizing and Monitoring Comprehension.

Age Diseth, Therese Kobbeitvedt (2010) —A mediation analysis of achievement motives, goals, learning strategies and academic achievement.ll previous research is in conclusive regarding antecedents and consequences of achievement goals and there is a need for more research in order to examine the joint effects of different types of motives and learning strategies as predictors of academic achievements with meta-cognition. Meta-cognition positively affected the use of the four study strategies. The strategy pathway involved positive effects of mastery and performance-approach goals on the use of meta-cognitive and deep cognitive strategies. Further, performance-approach goals positively affected the use of surface cognitive and resource management strategies. The use of meta-cognitive and resource management strategies had a positive and the use of surface cognitive strategies had a negative effect on exam scores.

Learning and Intelligence: Correlation

When reviewing the existing literature, specifically concentrating on the simple correlational studies of the relationship between learning and IQ, the comprehensive picture contributes little to our understanding. The measured correlations between learning measures and IQ vary over an extremely wide range, although the vast majority are on the positive side of zero when the learning is measured in such a way that higher scores represent superior performance.

However, on meta-analysis of major correlational studies reported in the literature no systematic conclusion can be drawn as we cannot come up with a single value which can represent the correlation between the two.

In many of the studies the assumptions taken are such that if all of them are considered, or even the mean of all of them is taken, it would scarcely be meaningful. Papers written by Estes 1970,1974,1981,1982; Gagne 1967; Zeaman & House 1967s can be studied for further details.

Now considering the other side and taking those studies which contradict the earlier findings.

The Woodrow studies dominated many discussions of learning and IQ for at least two decades. Woodrow claimed that intelligence is not the same as the ability to learn. He based this claim on the small, often non-significant, and at times even negative, correlations he found between IQ and a variety of simple laboratory type learning tasks. In many of the cases Woodrow has operationally defined learning in terms of the difference between performance in early and late trials. So, in the learning tasks he used there were usually significant individual differences in task performance, hence Woodrow's gain measures were not base-free and therefore manifested all the statistically intractable problems of change scores (or difference scores) that necessarily arise whenever the two points of measurement are correlated (Cronbach & Furby 1970).

So how the learning is measured is also one of the factors which has affected the results and findings of the studies designed to establish a relationship between learning and intelligence. Many of the findings appear to be such that, it is the biasness of the researcher which is highlighted in the findings as the results are many times quite contradictory. Positive correlation, negative correlation and no correlation are all obtained in the various studies on intelligence and learning.

The Phenomenology of Learning and Intelligence

In terms of its subjective phenomenology, learning seems more real, or more directly experiential, than intelligence. Any person from rural background who did not go through any formal education has definitely attained success as he has learnt everything in life through experiences. The learning of the individual has taken place as per the requirements and he has learnt everything which he is required to know. If he were so inclined, he could probably discover most of the basic "laws of learning" just by observing his own experiences with practice in a variety of tasks and noting the changes in his performance. By systematic self-observation of his changes in performance with practice, he should be able to induce such concepts as generalization, discrimination, extinction, transfer of training memory, retroactive interference, and forgetting. (Hermann Ebbinghaus)

So, it is better to define learning as the changes in a single individual's behavior in relation to the external conditions that govern these changes. While, intelligence measures are based on the analysis of differences between individuals in how they perform in a variety of mental tasks.

To dig it further learning can be of different kinds. By "kinds" of learning we mean, involving different brain mechanisms or neural structures. Differences in the learning paradigms, that is, the particular experimental conditions of learning are to be talked of. Different types of learning in operational terms, are referred in context of experimental conditions of learning or to the observable characteristics of the particular change in behaviour that occurs under the specified conditions.

When it comes to studying the relationship between intelligence and learning, one more concept is to be talked about, slow and fast Zeroing. These terms do not refer to individual differences in speed of learning, but to how the particular learning comes about.

Slow and Fast Learning. Most genuinely new learning is usually slow, with time the improvement in performance takes place gradually throughout the practice.

This is true for both motor skills and many cognitive skills. Acquiring proficiency in reading, in writing and in the basic "number facts" of simple arithmetic are examples of "slow learning." "Slow learning" is often preceded by "fast learning." One category of fast learning consists of "getting the idea." Learning to read music is a typical example. Fast learning is characterized by quickly "catching on," "getting the idea," "grasping a concept," or merely restructuring knowledge that one already possesses.

So, when it comes to considering the various kinds of learning the chief characteristic that distinguishes is the degree to which the learning of a given task benefits from some form of prior learning. This interaction between new learning and prior learning creates one of the main problems in interpreting the observed correlations between individual differences in learning and psychometric intelligence.

Conclusion

Recent research related to the topic have very clearly stated that the investigation of the relation between individual differences in learning and intelligence, which has focused on the correlation between measures of intelligence (which are usually defensible) and measures of learning (which are often questionable), has run its course.

More recent studies which are having a very good defined methodology and design and so be considered as highly valid and reliable studies sum up to the conclusion that learning and intelligence are not essentially independent factors (i.e., sources of individual differences), although they are distinguishable concepts in terms of the specific psychometric and experimental paradigms by which they are studied.

Any particular knowledge and skills that are developed with time in any individual are generally determined partly by advantage he/she acquires by the basic cognitive processes which help he/she to be skilled in a particular skill. The particular individual is also considered to be performing better when the frequency and strength of positive reinforcements are provided. Here chance and serendipity also play a part.

Learning transforms an individual's capabilities into achievements.

Intellectually and behaviourally, an individual's conspicuously strongest capabilities and achievements, that is, the individual's areas of special expertise, largely reflect the individuals' repertoire of overlearned and automatized skills and rapidly accessible knowledge.

Future research could well be successfully directed toward understanding just how individual differences in some specific context of learning eventuate in various forms of intellectual competence, expertise, and achievement, with their phenomenal range of individual differences

People who have gained subjective knowledge through experiences would never induce the concept of intelligence, or general mental ability. People have no subjective experience of their intelligence. There is nothing an individual could observe in his own behaviour that would permit him to induce the concept of intelligence. He would be aware of various abilities to perform particular tasks, and he would notice improvement in performance with practice on specific tasks. Also, he would be conscious of his effort. The reason, of course, is that the concept of intelligence is an inference, an abstraction, induced from the observation of differences between individuals in a certain class of behaviour.

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