Shifting Focus From Knowledge-Based Learning To Application-Based Learning

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Abstract

The value of knowledge application is emphasized within the National Education Policy, 2020. The system of education however continues to be largely driven by the need to disseminate knowledge from teachers to students. As a result, testing also reflects an imbalance in the kind of questions asked; most often 'knowledge and understanding' type questions. An effort is made to highlight the need for educational institutions to transform instructional processes so that they are fine-tuned to the aims, objectives and specified learner competencies. Paper setting too should be guided by a Blue Print with a conscious tilt towards 'application-type' questions and other Higher Order Thinking Skills. It would be necessary to assess these divergent responses with a spelled-out Assessment Criteria, as this would also go a long way in standardizing the evaluation process. These are important as the products of the present educational system need to be well-equipped with twenty-first-century skills before they are sent out into the world.

Keywords: application question, assessment criteria, cognitive domain, evaluation, instructional process

Introduction

For quite some time now the buzzword in several educational circles has been 'application-based' learning. Not merely students but parents and teachers may be concerned about the rejuvenated emphasis on the ability to apply knowledge. This essay aims to provide an overview of the meaning of the phrase "application-based" in the context of learning and evaluation, its need, and its undeniable relevance for us today.
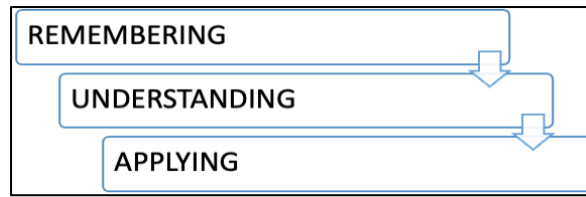
Figure 1: Bloom's Lower Order Thinking Skills within the Cognitive domain

The above diagram is based on Benjamin Bloom's revised Taxonomy of Educational Objectives, published in 2001 as 'A taxonomy for Teaching, Learning, and Assessment'. The original classification used the terms, "Knowledge, Comprehension and Application" for the Lower Order Thinking Skills.

In the cognitive domain, 'Remembering' is the first level of the 'Lower Order Thinking Skills' (LOTS). So, any data, from any source, that learners are expected to recall, based on memorizing is called 'remembering' (that is, an action verb, to remember). This is unlike the originally used term, 'Knowledge' (a noun, that symbolizes something that is a monolith, static; but not dynamic).

Way too much weightage of time and energy tends to be given to the acquisition of knowledge, that a large component of our instructional process revolves around dissemination of data, which, ironically, can otherwise be easily accessed at one's fingertips! Especially during the present Covid-19 pandemic, where much of our teaching is confined to the online mode, can we alter our instructional strategies so that useful learning resources may be given pre-class and the online space could instead be used more effectively for active discussion, debate, analysis, or creative ends? 'Lecturing down' continues to be an authoritarian characteristic and the bane of our educational system. A large majority of teachers, especially as one proceeds towards Higher Education, tend to use the dated 'lecture method'. As a result, much time during the instructional process tends to be 'teacher-talk'. This pushes the learner into a passive mode of learning rather than one that could have otherwise been active, fun, and exciting.

We can agree that recalling data has its due place, for it is necessary to have the knowledge and understand it in the first place; so that one can then apply it to novel situations, to extrapolate arguments, to analyze new content, synthesize ideas, for creative outputs and problem-solving. Today, however, data are readily available and accessible; but this can well be the starting point of a long journey. Mere knowledge acquisition serves an

extremely limited purpose. There are other purposes that go beyond merely testing the 'retentive' capabilities of our learners and examination candidates.

The next level of the cognitive ladder is 'Understanding'. It requires "knowledge" as a pre-requisite. So, for example, a learner would need to know the 'what' of something (for example, gender, biodiversity, Nationalist Movement) before being able to demonstrate one's understanding of the same. The technique of 'Flipped classroom' is a strategy to get learners to read before class and own responsibility for the same. We are quick to argue here that present-day learners don't commit themselves to read; thus, we are back to the 'chicken and egg' argument! As facilitators, we have the freedom to make a start, challenging as it could be. A follow-up quiz is one way of encouraging pre-class reading.

An off-shoot of a teaching process that lays undue value on knowledge acquisition is also reflected in our modes of assessment; there is a skewed emphasis on memorizing/rote-learning. It is pertinent to note that the 2020 National Education Policy aims to diminish the value attached to rote learning. Have we paused to wonder why there has been an excess value to data memorization? Why is there an overwhelming emphasis on data transmission and data recall? Is it possible to shift our focus from providing information to building/constructing knowledge during the instructional process and develop testing methods that gauge the application and other Higher Order Thinking Skills (HOTS)? Application-type questions encourage learners to think outside the box and to employ divergent thinking and problem-tackling strategies. Such questions will refreshingly generate multiple responses and creative ones too. Evaluation can transform into a meaningful process than remain a drudgery.

Twenty-first century learners however, cannot rest content with merely possessing knowledge. More valuable today is the ability to utilize knowledge for problem-solving, analytical, creative and practical use. This would fit in with the notion of constructivism, which has been emphasized by National Curriculum Framework (2005). Are our learners trained for these new-age demands? These demands can be tested through the use of application-type and HOTS questions.

Inextricably linked to Instruction, are the processes of Assessment and Evaluation, of which Paper Setting is at its core. At the Higher Education stage, more often than not,

Paper Setters are not known to work out a structured 'Blueprint of Question Paper'. By stark contrast, this continues to be an essential requirement and pre-requisite for setting Board Examination Question Papers in the Secondary stage of education. A cursory analysis of UG and PG question papers, especially in the Arts/Humanities streams reveal the imbalance of knowledge and understanding-type questions versus application and higher-level cognitive skills.

It is worth noting that mere fulfilling of Blueprint requirements is of limited value. Far more valuable, and worth asking is, whether our instructional processes have *enabled the development* of these varied application skills and cognitive competencies? Are our learners prepared to handle application-type questions and HOTS? One could go further to ask if teachers and examiners themselves are well-equipped to do the same? Shouldn't faculty members acquire these twenty-first-century skills so that we can become effective facilitators of the same?

A case in point: Even if one might ask questions beginning with "Critically evaluate" for example, are we asking candidates to give *their* critical appraisal, or do we expect them to provide regurgitated data citing critical reviews of 'established scholars'? Worse still, is when there are ready-made "answers" to 'application-type questions' which are found in prescribed textbooks, guides, market notes, teachers' handouts or the internet. These practices clearly and blatantly attack the very purpose of 'application-based learning' – which is to facilitate multiple responses, innovative thinking, and creativity.

The third tier is 'applying'; a level that requires learners to 'remember' and 'understand', so that they are better equipped to suitably apply the data that is recalled and understood. Take for example this situation: How can a teacher expect a student to satisfactorily comment on the functionality of family, if the learner does not understand the meaning of 'function' or the Theory of Structural Functionalism, or the Systems Approach? This would be illogical. Foundational knowledge and the ability to recall and understand the data are essential.

Thus, if a learner can recall and understand the meaning of the concepts of 'function' and 'family' and its characteristics, it should be possible to demonstrate the application of one's knowledge to related questions, case studies, problems or situations presented. It is

important to note that this *transitioning* is not automatic. The challenge is especially palpable when a learner moves from School to UG education, from UG to PG, or from a Master's programme to Ph.D. It would be necessary for the facilitator to illustrate with relevant examples, activities, discussions, break-out online/in-person groups, peer-learning, collaborative learning, etc., to enable learners to *develop* application and HOTS skills. Taking students through the process will provide them with the inputs and ideas to proceed successfully towards application and HOTS.

For the vast majority of students who are used to learning by rote, the lament is that there are no ready-made "answers" to 'application-type' questions. This is also the argument presented especially by examiners, when it comes to paper assessment. Application-type questions lend themselves to multiple responses; there is no 'one size fits all' principle here. Each learner has the freedom to demonstrate one's ability to apply 'knowledge' to a new situation or context. This is not to say that 'anything goes'.

To be able to *apply* one's learning is an essential 21st-century skill; the ability to solve, arrive at something new, find solutions, or alternatives or think outside the box is an especially valued 21st-century skill. It is not sufficient to merely re-think our instructional processes and revamp one's paper setting skills; it is equally imperative for evaluators to develop appropriate 'Assessment Criteria' (or an Assessment Rubric). The rubric/criteria would need to be transparent; they would have to be clearly communicated at least to the learners. Explicit criteria will help to standardize the marking of test/exam papers, projects, research reports, presentations, etc.

We have been discussing the value of application-type questions. Compare the examples (Sets A and B) given below:

Set-A:

a) Draw a neat and labelled diagram of the digestive system of an earthworm.

b) Describe the problems of migrants.

c) Explain the features of nitrogen.

d) Identify the rivers marked on the map given.

e) Define 'buoyancy'.

None of the questions in 'Set A' help us to explore 'applying' abilities of examinees. In fact, these questions only lend themselves to finding out the capacity of examinees to dish out previously learned material.

Observe how the questions in 'Set B' below provide more scope for learners to showcase their application skills and HOTS.

Set-B:

a) Read the descriptions of the two situations provided. What measures would you suggest to solve the problems that you anticipate?

b) 'There is a correlation between overpopulation and intense competition in every sphere of society today.' Discuss this statement with relevant examples of your own.

c) Show the effect of buoyancy in the experiment described below.

d) Discuss the role of nitrogen in the given reaction.

e) Why do you think cropping patterns vary between the West and East coasts of India?

The National Educational Policy 2020 encourages teachers and learners to move towards 'application-based' learning and testing. This is not a new suggestion as the National Curriculum Framework had also emphasized the same objective over a decade prior. Those of us who are part of a changing educational system must start making these changes in our teaching styles as well as in the skill of paper-setting, question construction and evaluation. In order that our learners are better-prepared to tackle application-type questions, which is the thrust of this article, we have to rework and rethink our *methods* of instruction, the *objectives* of our lessons as well as pre-determined learner competencies for every module. These would not only need to be in tune with our Aims and Objectives, but they would also need to be inextricably linked to testing, so that *effective* evaluation can take place.

Teachers may shy away from writing and sharing 'Model Answers' with their students. The stated fear is that students would, over time, study these and hence they refrain from going beyond the minimal framework. How then are learners expected to know what a

'model' answer is like if the teacher remains uninclined to demonstrate this in concrete terms? The very suspicion that learners will end up returning these 'model answers' will expose the abject failure of teachers to be creative paper setters in the first place.

To summarize, Application-based learning involves the interaction between the instructional process and evaluation. The facilitator plays an instrumental role as one has the freedom and autonomy to incorporate active learner participation during instruction. This is possible if there is well-thought out academic planning. As regards the evaluation process, here are some suggestions to move towards asking application-type and HOTS questions: (i) Prior to paper-setting, design a 'Blue Print of Question Paper' that is tilted towards Application-type and HOTS. (ii) Factor in the aim and objectives of the paper and take into account the stated learning competencies for each module. Question-items must be linked to these measurable learner competencies. (iii) When formulating question items, we must ask ourselves if the questions are those which encourage examinees to cite ready-made "answers", or do they encourage originality of thought, application of knowledge, creativity and divergent thinking? The bases for developing application-type and HOTS questions should take into account the resources and learner experiences of the instructional phase. This includes textbooks, reference materials, videos, guest lectures, webinars, internet sources, activities, life experiences, unplanned events, experiments, etc.

All that is written above focuses largely on the cognitive domain of learning. Have we ever wondered why the 'affective domain' is hardly given any valuable presence while setting question items? One could also bear in mind the value of 'transfer of learning,' within the subject, between subjects, between previous knowledge and newly acquired data, so that a more holistic understanding and application can be demonstrated through questions that are asked. Cumulative learning is important so that ultimately the individual can appreciate the value of holistic rather than compartmentalized knowledge. Such learning will hold the learner in good stead and bring us a step closer to the goal of academic excellence, and perhaps better preparedness for future individual and societal needs.

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