Designing for Children
- With focus on 'Play + Learn'

Designing a learning-integrated, play-inspired assessment framework for children aged 11-15

Srishti Mehrotra, National Institute of Design, srishti_m@nid.edu

Abstract: The purpose of this study was to understand the landscape of school assessments and their relevance in the contexts of education and society. The paper is based on the belief that assessments can be used to bridge the gap between the ideal and present state of education, by bringing together multiple stakeholders and provide an avenue for collaboration, contribution and continuity.

The paper discusses the need for a more robust and holistic student assessment, and suggests a format for a framework of Student-Led Interest-Guided Inquiry.

Introduction

The pursuit of excellence has become the pursuit of accolades; the pursuit of knowledge has become the pursuit of grades.

Figure 1a and 1b show the cut-off marks for sixteen colleges of Delhi university for two courses - B.Com(Honours) and the B.A. Programme, from the years 2012 to 2018. Both graphs show the upward trend of minimum required marks as entry points into the various colleges. If the ultimate aim of schooling is to enable further education, high marks become the ultimate goal that students need to aspire to. Any mark less than the minimum required, even by a fraction of a percentage, could mean non acceptance into a college of

their choice. With marks, either from boards or entrance exams, being the sole factor for admission in most colleges around the country, there is excess stress on students to perform. This quest for superior grades has not only overtaken extracurricular activities, social life and playtime of students, but also compelled parents to enrol students in additional, supplementary classes.
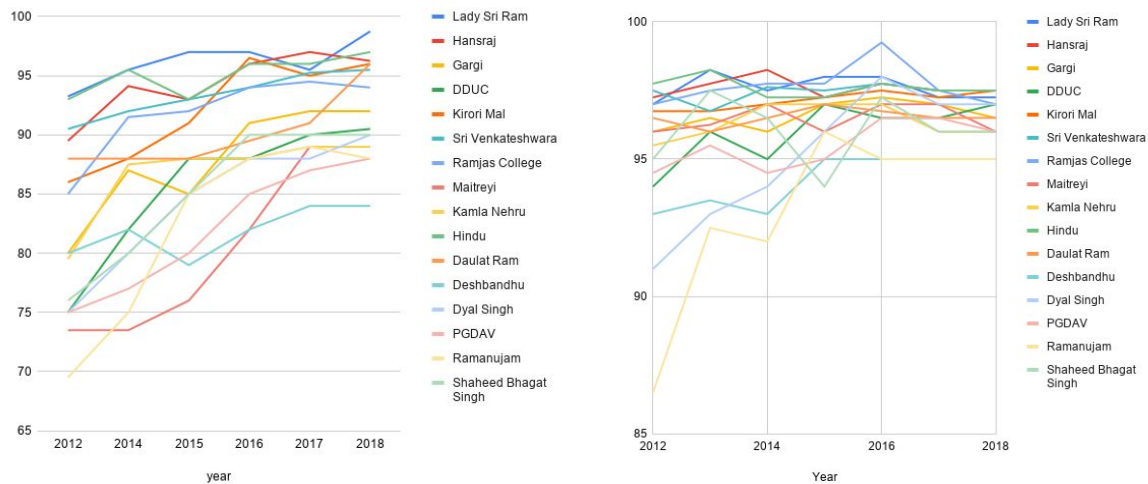
Left: Figure 1(a): Cutoff scores for B.A. Programme
Right: Figure 1(b): Cutoff scores for B.Com (Honors) Programme
Data Source: Delhi University website, available at <http://www.du.ac.in/du/index.php?page=previous-cut-offs>

Private tuition is pervasive in all parts of the country, and is deemed necessary by the parents of students across the ability and marks spectrum. According to the June 2018 US Census Bureau CARE ratings report, 26% of upper primary students (class V - VIII) in India are presently enrolled in privately paid tuition. The Indian Coaching industry, which was estimated to be Rs 2170 Billion in the is predicted to grow to a market of Rs 3150 billion by the year 2020. Contrary to what the name suggests, this supplementary education does not complement what is taught in school, but rather reinforces the importance of 'scoring well'.

The Fault in our Marks:
Until the mid 19th Century, when philosophers and academicians began to realise that oral assessments were subjective and ineffective, written exams were not prevalent in schools. Modern examinations are a derivation of the wave of intelligence testing which emerged in the early 20th Century. Scientists and academicians such as E. L. Thomdike and Alfred Binet developed and started administering tests which could (a) provide objective, quantifiable results; and (b) allow them to classify students as per their level of intellect.

Around the same time, the US army started employing the Army Alpha Test as a legitimate means of making decisions about the achievement and aptitudes, and as a way of recruiting likely officer candidates from a pool. Educators hoping to capitalise on the expert and efficient grouping procedures practised by the army began adopting similar ways to stratify students. Social factors, such as booming education, in terms of school building and enrollments, as well as the need for industrial efficiency pushed schools into describing student performance as per test results, a practise now adopted all over the world.

Examinations, in their current format, have some obvious benefits. Firstly, they are easier to administer and evaluate, and serve to simplify the process of educational decision making. Ideally, standardized examinations champion the democratic ideal that all children have equal opportunities for educational advancement, by measuring all children against the same level. The current pattern acknowledges the idea that developing increasingly sophisticated tools would result in a more objective and equitable system of assessment. (Chapman 1988, Hamson, 1993). Horace Mann proposed that common exams would provide objective information about the quality of teaching and learning, in a convenient way. A century and a half later, results of standardised written exams, such as board results, not only indicate student efforts and abilities, but also become essential marketing tools for schools to persuade parents and increase student enrollment, and to defend against loss of students.

The result of standard exams is received in the form of a number or percentage. A 79% in a science examination communicates very little about what is learned, what needs improvement, what needs to be done next. There is a lack of transparency. Whereas detailed instructions and feedback is unique in each case and often multifaceted, a 'mark' exists only in one dimension, and facilitates comparison.

Understanding Assessments:
At their core, assessments are a method of gathering data about the effectiveness of teaching and student learning. The word evaluation (read e-VALUE-ation) suggests drawing on the instructor's judgement to determine the overall value of the outcome based on this data. An examination, is then, a decision making process, after weakness and deficiencies are identified, enables the design of ways towards improvements. The purpose of such evaluations is to serve as a thermostat to understand the extent to which the objectives of

a particular subject, module or year have been met. The information from the assessment serves to align subsequent efforts towards a desirable outcome.

Examinations seems to have lost something essential in their attempt to simplify and streamline this process. The format of written examination continues to be derived from the mechanistic viewpoint originating from the industrial model of education, which values efficiency, not effectiveness as its ultimate endpoint.

A common phenomenon from school tends to be the term 'out-of-syllabus', whereby chapters, or sections from textbooks are skipped as they are not going to appear for the exam. This reiterates Drucker's famous management quote - "What gets measured, gets managed". The phrase can be adequately moulded to describe the state of education in schools: What gets tested us taught. In this way, education seems to have oriented itself towards exams. Testing, originally intended as a small part of education, has become the goal of education.

The problem is magnified when the barriers between learning and examinations are considered. There is often an 'exam week' every term which is separate from 'learning time'. It is a period during which students are required to 'study' (read memorise) solely with the intent on passing the exam. All activities, at home and in school, are suspended, and no classes take place in this duration. There are strong temporal and psychological barriers created between learning and assessments, which make way for deep rooted segregation between both.

There is much research on new learning systems and alternate teaching methodologies. However, as long as the ultimate goal of education continues to be 'scoring well' in the current format of exams, education is unlikely to change.

However, assessments can not be completely eradicated from the system. They form the essential feedback loop which enables teachers to understand the effectiveness of their own methods. However, they need to be reintroduced in a way which is less daunting, and more integrative.

Understanding Early adolescence

Educational research has favourite children. They are the preschooler (early childhood education), and the college kid (higher education). The middle schooler has been the largely ignored/overlooked middle child. Very few studies have been dedicated to early adolescence and middle school education, despite this age being a formative one for all humans. It is a time of rapid physical, cognitive and social development of students, where differences in educational approach can have long lasting effects on their personalities.

Physical	Cognitive	Social
Rapidly growing body - become awkward and clumsy without physical movement	Ability to form abstract thoughts, think hypothetically	Begin to form self identity, rebel from authority
Changes in circadian rhythm - rise later than young children and adults	Ability to reason from concrete visible evidence, and use trial and error	Develop higher level of self awareness and control
More hormones lead to more emotional rewards - so become more sensitive to rewards and stress	Able to associate present actions with future consequences	Peer group replaces parents as source of advice
The limbic brain develops before PFC - more reckless behaviour	Develop awareness of their own thought process.	

21st Century skills

The 21st Century skills, are a set of skills which is deemed essential for students of the 21st century. There are multiple versions of what they need to be, with each list differing from the next by a few skills. The few skills that are common to almost all lists are as follows:

Critical thinking	Problem Solving	Digital Literacy
Learning to learn	Initiative	Communication
Information navigation	Collaboration	Flexibility

Leveraging the power of assessments

The uneven distribution of power in favour of exams can be used as a corrective mechanism for itself. In a system where what is tested is taught, changing what is tested may have a significant impact on what is taught. Assessments can become an integrative element, which not only assesses and measured the ways in which a student has grown through the course, but rather, become an agent to synthesize the various perspectives through the lenses of various subjects.

The suggestions which follow in this paper are reflective of the belief that effective assessment methods can be formative of democratic communities of learning and teaching. They can become an avenue of collaboration, contribution and continuity. They can bring together different stakeholders to develop trajectories of learning for students, and therefore bridge the gap between the requisite 21st Century learning, and present level of learning.

As what is tested is valued, can what is valued be changed by what is tested?

Suggestions for the new assessment pattern:

Instead of having a common pattern throughout all grades, the format can be set on the basis of the physical and cognitive developmental milestones of students.
Additionally, a new exam pattern would centre around
-reintegrating the assessment process within the larger system of learning
- testing the ability to process information at various levels of cognitive function, not just information recall
- testing for 21st Century skills,
- being suited for and contributing to optimal development of children
- being integrative and holistic in approach
- being driven by intrinsic motivation wherever possible
- completing the feedback loop to direct future learning, by communicating student progress and direction

The need to DO

An evaluation system, which not only tests knowledge, but the students' ability to actually *Do*, not only assesses the level of understanding within the student, but also augments the learning process as the student is given the opportunity to experience the many facets of the subject. In this case, even if an experiment or an idea fails, the student not only sees the failures but can explain why they happened, all of which contributes to greater learning.

Play as a vehicle for learning

Play is a phenomenon that is instantly recognisable to an onlooker, yet hardly describable.Despite multiple attempts at definitions over the years, no solid, universally agreed-upon definition exists. Despite this, the role play has in learning is indisputable. As the definition of play lies beyond the scope of this study, for the purposes of this study two definitions of play are taken forward.

The first is from Katie Salen and Eric Zimmerman, from their book Rules of Play. It states, "Play is free movement within a more rigid structure".

The second is from Jesse Schell, from his book The Art of Game Design - "Play is manipulation that indulges curiosity".

In its essence, play is an activity which allows for freedom within a specified structure, which engages/indulges a child's natural curiosity. It is therefore a source of intrinsic motivation. The rigid structure may be imposed by the natural properties of the object being played with, or by the rules placed in a game. Play, instead of being goal motivated, attempts to answer questions such as "What happens when I do this?" or "How far can I go with…" or "What happens when I finish this level"? (Schell,J. 2008), and does so via a willful action.

The design process as a process of learning and assessment

One of the most understood and important aspects of the design process is its non-linear nature. In a reality where almost nothing is simplistic and linear, why is education limited to lectures, readings, videos, all of which are linear and almost always inadequate to convey and understand a complex system of relationships? The design process can become a good starting point to develop a learning methodology.

Student ownership

Curious students have an advantage in the classroom, not only because they learn more, but because they retain more when they pursue knowledge they want to pursue. This ownership comes with autonomy, and the belief that they hold the power to direct the course of their learning.

Recommendation/ Concept - The evaluation pattern:

The recommendation is a long term Interest Guided Inquiry, which treats assessment AS learning.

Assessment *as* learning focuses on the explicit fostering of student capacity over time to be his/her best assessor.

Instead of being administered at the end of the academic term like the prevalent exams, the Inquiry is embedded into the school curriculum, being temporally integrated within the term.

It is a project based approach, which is facilitator guided, and student-evaluated and defended.

In brief, the student picks a topic of his/her choice to study for the duration of the term, and studies that topic from the lens of multiple subjects.

Inspired by the 'free movement within a rigid structure', the framework has two components - the Dynamic and flexible, and the bounded and rigid.

The rigidity of the framework is provided by the definite deliverables, and predetermined criteria which is common for all students. The flexibility and dynamism of the framework are derived from the choice of topic, the vast possibilities of final outcome, and flexibility in the process followed.

Devising areas of growth: Criterion referenced assessment means there would be no comparison between the students, and a common standard would be maintained for the same.

After taking into account the various developmental milestones of children in this age group, the evaluation takes place in six buckets. These are:

1. Planning and Action
2. Investigation
3. Thinking and Understanding
4. Collaboration
5. Reflection
6. Outcome, Documentation and Communication

Example Project Brief:

The project could be communicated to students in the following manner:

Student chooses a broad topic of interest and studies it in relation to each subject studied as part of the curriculum as well as any additional subjects and topics, which leads to an outcome - any outcome is permissible upon discretion with the facilitator

Maintain a reflective document/ journal about the process planned, actions taken and changes in process, using this to demonstrate progress against the criteria

Record evidence of the process followed and defend himself/herself against the predetermined criteria.

Student should be able to periodically reflect through the criteria and alter the process to fulfil all criteria

Student showcases the outcome during the project showcase.

Some examples of topics which may be chosen are as follows:

Food	Human body & health
Transport	Homes & living
Communication	Identity
Media	Games & sports
Clothing	Water

The outcomes of the project could be in any form of the student's choosing, including, but not limited to: a physical model, posters, charts, magazine/booklet, creation of game, written literature (such as story or poem), presentation, skit, theatre act. This would be accompanied by a reflective process journal, and an evidence file.

Marking and grading

As part of The Ladders, students have the capacity to evaluate themselves against the set criteria. The marking takes place using a hexagonal 'ladder', with each side representing one metric being measured. Instead of being awarded a numerical grade, the level achieved for each metric is shaded in the hexagon grid as in Figure 3(a), or by indicating the level in the grid as shown in Figure 3(b).

For each criteria, they must provide justification of the level they have allotted themselves by providing concrete evidence. This is suggested to be undertaken in the form of an evidence file.
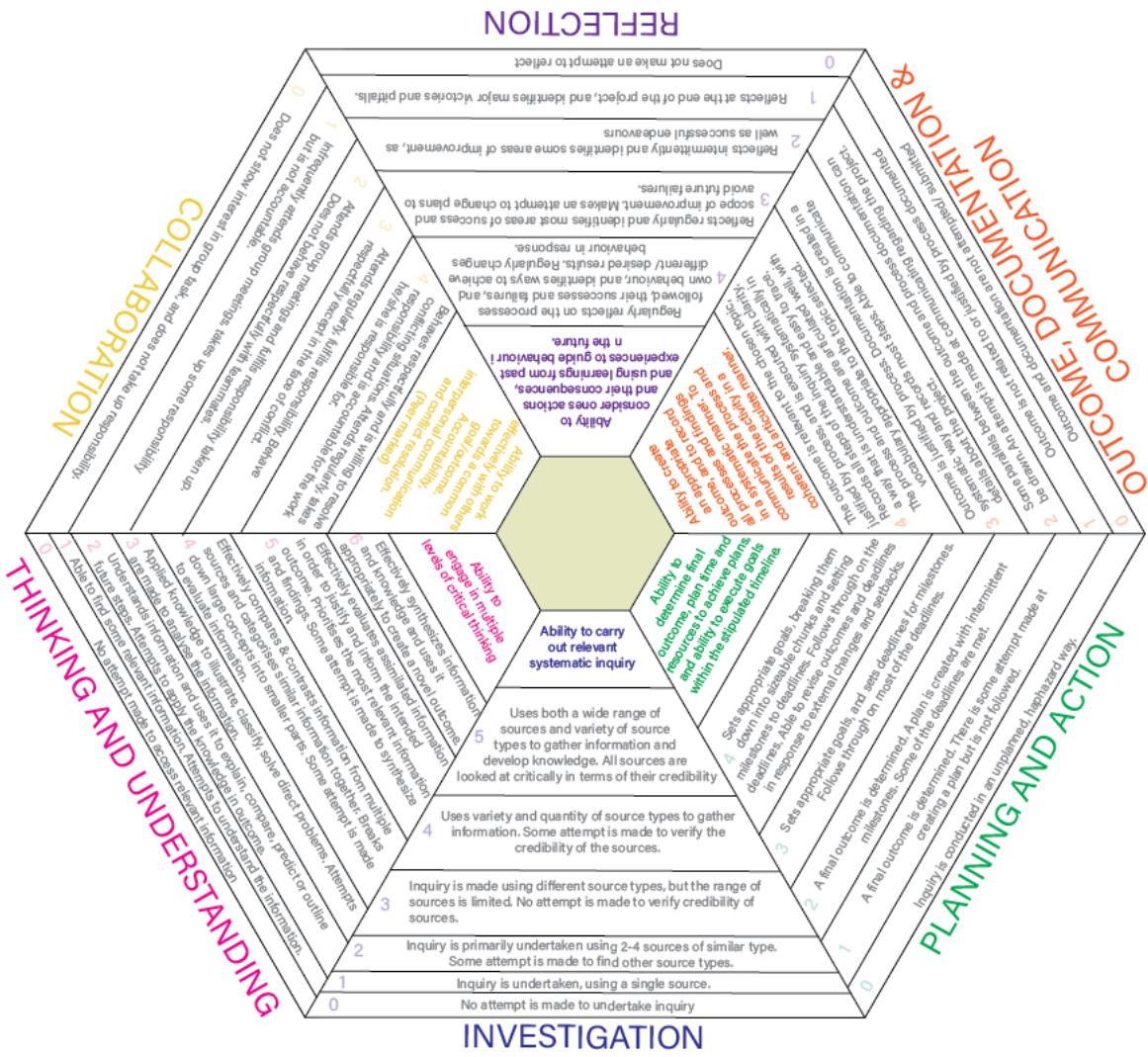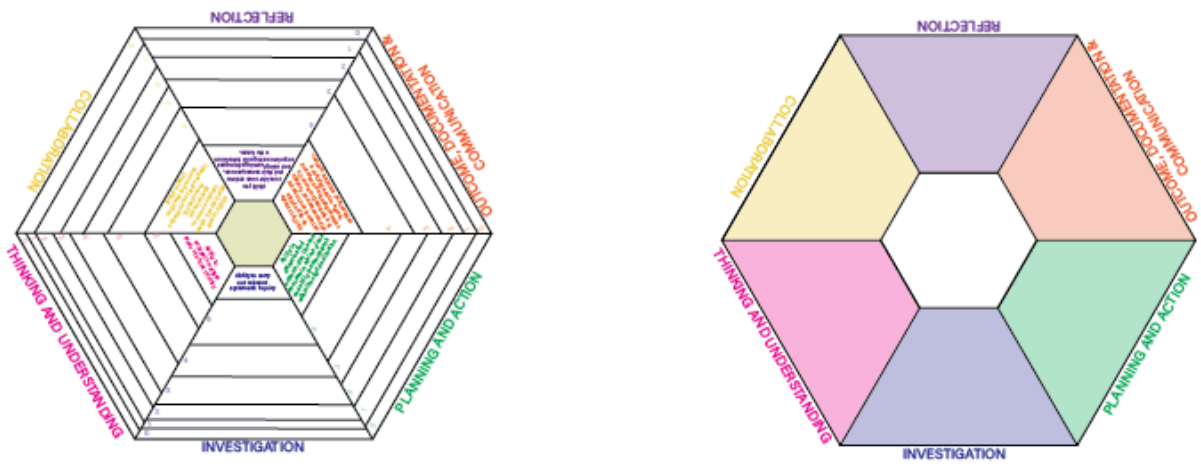
REFLECTION

Central: Ability to consider ones actions and their consequences, and using learnings from past experiences to guide behaviour in the future.

- 0: Does not make an attempt to reflect
- 1: Reflects at the end of the project, and identifies major victories and pitfalls.
- 2: Reflects intermittently and identifies some areas of improvement, as well as successful endeavours
- 3: Reflects regularly and identifies most areas of success and scope of improvement. Makes an attempt to change plans to avoid future failures.
- 4: Reflects regularly and identifies most areas of success and scope of improvement, and identifies ways to achieve different/ desired results. Regularly changes behaviour in response.
- 5: Regularly reflects on the processes followed, their successes and failures, and own behaviour, and using learnings from past experiences to guide behaviour in the future.

COLLABORATION

Central: Ability to work effectively with others towards a common goal/ outcome. (Interpersonal communication and conflict management)

- 0: Does not show interest in group task and does not take up responsibility.
- 1: Infrequently attends group meetings and takes up some responsibility but is not accountable.
- 2: Attends group meetings respectfully with teammates. Does not believe in responsibility taken up.
- 3: Attends regularly except in futile responsibility. Is accountable for the work.
- 4: Behaves respectfully and is willing to resolve conflicting situations. Attends responsibility. Believes lower.
- 5: Attends regularly and is willing to resolve conflicting situations.

THINKING AND UNDERSTANDING

Central: Ability to engage in multiple levels of critical thinking

- 0: No attempt made to access relevant information
- 1: Able to find some relevant information. No attempt made to access relevant information.
- 2: Understands information to apply in future steps. Attempts to understand the information.
- 3: Applied knowledge to analyse the information and uses it to explain, classify, solve direct problems, predict or outline
- 4: Effectively compares & contrasts similar information together. Breaks down large concepts into smaller parts. Some attempt is made to illustrate, classify, solve direct problems. Attempts to evaluate information. Prioritises the most relevant information.
- 5: Effectively synthesises information and knowledge and uses it appropriately to create a novel outcome. In order to justify and inform the intended outcome and findings. Some attempt is made to synthesise information.

OUTCOME, DOCUMENTATION & COMMUNICATION

Central: Ability to create an appropriate outcome, and to record and communicate the process and results in an intelligible manner.

- 0: Outcome and documentation are not related to attempted/submitted
- 1: Some parallels be drawn. Outcome specifies what few details about the project.
- 2: Outcome is justified by process and specifies most steps taken.
- 3: Outcome is justified by process and process documentation is created in a way that is relevant to the topic selected. Able to communicate.
- 4: The process is relevant to the chosen topic, and the outcome is justified by process. Documentation and process documentation is created in a way that is relevant and easy to understand and is focused on the topic selected.
- 5: The process is justified by process documentation, which details most steps and process. Able to communicate the outcome effectively.

PLANNING AND ACTION

Central: Ability to determine final outcome, plan time and resources to achieve goals, and ability to execute plans within the stipulated timeline

- 5: Sets appropriate goals, breaking them down into sizeable chunks and setting milestones. Follows through on the deadlines. Able to revise outcomes and deadlines in response to external changes and setbacks.
- 4: Sets appropriate goals, and sets deadlines for milestones. Follows through on most of the deadlines.
- 3: A final outcome is determined. A plan is created with intermittent milestones. Some of the deadlines are met.
- 2: A final outcome is determined. There is some attempt made at creating a plan but is not followed.
- 1: Inquiry is conducted in an unplanned, haphazard way.

INVESTIGATION

Central: Ability to carry out relevant systematic inquiry

- 5: Uses both a wide range of sources and variety of source types to gather information and develop knowledge. All sources are looked at critically in terms of their credibility.
- 4: Uses variety and quantity of source types to gather information. Some attempt is made to verify the credibility of the sources.
- 3: Inquiry is made using different source types, but the range of sources is limited. No attempt is made to verify credibility of sources.
- 2: Inquiry is primarily undertaken using 2-4 sources of similar type. Some attempt is made to find other source types.
- 1: Inquiry is undertaken, using a single source.
- 0: No attempt is made to undertake inquiry

Figure 2: A large version of the hexagon framework for reference. It includes detailed descriptors for each level of each metric.

The evidence file is prepared by the student while self-assessing. The file contains 'proof' that the criteria indicated at every level has been met. It may contain clippings, photographs, scans/photocopies of the reflective process workbook. For example, Level 5 in the Investigation metric requires research from a variety of sources, along with reflection and critique on the validity of the source. The evidence for this can include clippings of books and articles, along with scans of the journal in which the credibility of the source is discussed.

The role of the facilitator

The ultimate aim of this framework is to build student capacity to be the best assessors of their own learning. However, teachers need to start by presenting and modelling external, structured opportunities for students to assess themselves. This often takes place in the form of formative assessment. The facilitator would also need to help students understand the way in which to use the information derived from this assessment in order to monitor their own progress (self assessment) as well as that of their peers, and to make adjustments, reflect on learning and set future goals.

Conclusion - Looking Ahead

As assessments are viewed as extremely important, it is likely that changing the content of the assessment will have a great impact on the focus of teaching methods. When the examination format shifts from testing for content (which is inert) to testing for process (which is developing), there will be an eventual mindset shift from valuing content to valuing process. With students being in charge of the inquiry process, the onus of education would shift to students, equipping them with the skills to carry out future inquiries without being dependent on someone to 'teach', preparing them for a rapidly changing world.

In this way, assessments can become a corrective mechanism to restore the balance which has become extremely skewed in favour of them, creating a culture of learning in the communities in which this method is administered.

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