# Changing the Goals of a Stagnated Education System:
# The Why and the How

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> *It is not the strongest that survives, nor the most intelligent. It is the ones who are most adaptable to change. Those that have learned to collaborate and improve will prevail.*
>
> Charles Darwin
> Origin of Species in the Struggle for Life (1859)

An education system that was designed to prepare workers for the industrial revolution still dominates what goes on in most U. S. classrooms and in classroom around the world that are dominated by rigidly controlled ministry of education curriculums. Despite the endless calls for education reform, the major goal is still the acquisition and retention of information delivered through a highly prescriptive curriculum. The influence of state standardized achievement tests to measure school quality obviously accounts for memorization of information to be the main goal of today's instruction. And most proposals for school reform, regardless of upmarket names (Competency Based Learning, Assessment Driven Instruction, Standards Based Learning), improving content acquisition and improving test scores still drives the pedagogy that goes on in most classrooms. This brand of learning is especially perverse in schools that serve low-income and minority students.

The information age, however, has now given us the tools to examine what is hopefully greater enjoyment and engagement in learning. Most of our students now carry devices with more computing power than a supercomputer of just a few years ago and they can easily connect to tens of thousands of digital, information-rich, electronic networks. And the impact of upcoming and recently unimaginable intellectual tools such as quantum computing, artificial intelligence, and fractal-parallel computing will introduce radical changes in education at all levels. The need for rote memory of information will be diminished and we need instead to place our focus on how and what information needs to be gathered and most important, what skills students need to develop in order to analyze and use information to address a particular topic or problem they may be addressing. This is not to say that content acquisition is unimportant, but what students do with information represents an educational goal that develops what have commonly been called 21st Century thinking skills.
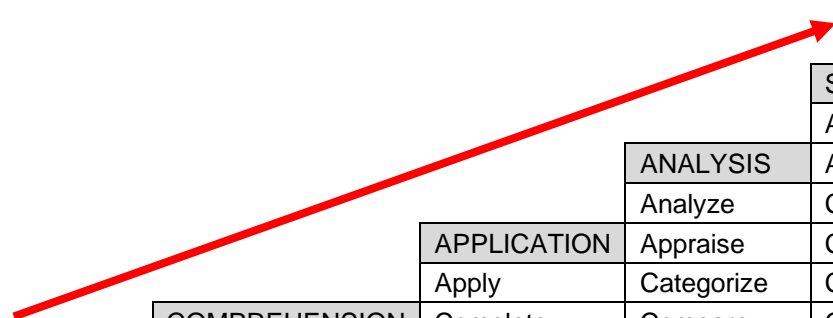
Benjamin Bloom (1956) created a taxonomy of measurable educational objectives to help us describe and classify observable knowledge, skills, attitudes, behaviors, and abilities. The theory is based upon the idea that there are levels of

observable actions that indicate something is happening in the brain (cognitive activity). And Krathwohl and others (1964) created a parallel taxonomy that deals with objectives in the affective domain. By creating learning objectives using measurable verbs (see Figure 1), teachers can indicate explicitly what students must do in order to demonstrate more analytic and creative use of content information learning.

The Taxonomy was greeted with much enthusiasm by academics and progressive educators; but alas, its popularity was short lived, unquestionably due to the stranglehold that standardized achievement tests still exert their power about what goes on in schools and classrooms. It is far easier to measure who knows the names of U. S. state capitals than to analyze, for example, the reason why a particular capital was selected for a given state or how can students create a travel brochure that makes a state capital an interesting place to visit. Imagine the amount of creativity and research (and teamwork if done as a group project) that will be involved if higher level thinking skills are required to address these types of questions. The essence of this type of work is not to eliminate the importance of plain ole factual knowledge. Rather the purpose is to learn how knowledge can be addressed at a much analytic and creative levels.

**Figure 1.**

*Verbs That Demonstrate Various Levels of Thinking.*

| KNOWLEDGE | COMPREHENSION | APPLICATION | ANALYSIS | SYNTHESIS | EVALUATION |
|---|---|---|---|---|---|
| List | Compare | Apply | Analyze | Arrange | Appraise |
| Name | Describe | Complete | Appraise | Assemble | Argue |
| Recall | Discuss | Construct | Categorize | Collect | Assess |
| Record | Explain | Demonstrate | Compare | Combine | Choose |
| Relate | Express | Dramatize | Contrast | Comply | Compare |
| Repeat | Identify | Employ | Debate | Compose | Conclude |
| State | Recognize | Illustrate | Diagram | Construct | Estimate |
| Tell | Restate | Interpret | Differentiate | Create | Evaluate |
| Underline | Tell | Operate | Distinguish | Design | Interpret |
| | Translate | Practice | Examine | Devise | Judge |
| | | Schedule | Experiment | Formulate | Justify |
| | | Sketch | Inspect | Manage | Measure |
| | | Use | Inventory | Organize | Rate |
| | | | Question | Plan | Revise |
| | | | Test | Prepare | Score |
| | | | | Propose | Select |
| | | | | Setup | Support |
| | | | | | Value |

The main question is, of course, how can we integrate these thinking skills into an overly prescriptive and test-driven curriculum? First, we must make teachers aware of information about thinking skills and the teaching strategies that promote them. Primary among strategies is professional development about questioning techniques and resources such and a great book by Erik Francis (2016). Second, students need to be made aware of the ethics of using devices such as artificial intelligence to prepare their schoolwork. "If you use AI to write your term paper you should realize that it will have a very negative affect on the development your creativity, thinking skills, and even your overall intelligence. And programs are now available to determine if work is machine-written or original."

The most important thing that teachers can do is to become familiar with technology resources that aid in the pursuit of the higher-level objectives. There are thousands of sites online with information on this kind of teaching and even lesson plans for various subject areas and age groups. One resource that has been specifically developed for this purpose is a program that gains and analyzes information from student surveys to create an individual profile of student interests and other strengths. A computer program then examines each student's profile and sends them student-specific recourses from a data base that contains approximately 50,000 enrichment-oriented resources (Field, 2009; Renzulli & Reis, 2009).

The amount spent on education makes it one of the largest enterprises in the country. But we are way behind the business, medical, communication and other fields that are making radical changes through the use technology. It has never been easy to make changes in an education system that has, for far too many years, focused mainly on information acquisition, storage, and retrieval. But the digital age has made the changes discussed here far easier for us. So, we can now use this technology to make most learning experiences more enjoyable, personalized, engaging, and challenging for all students. The rationale for changing the goals and the resources for doing it are here. Education leaders and policy makers need to get beyond the business-as-usual mindset and think about how our noble profession can catch up with other professions and even some of our young students who do things on their electronic devices that are far more advanced than what they learn in school. Do we have the courage and commitment to make these changes?

## References

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