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Defining and Aligning Outcomes, Assessments, and Credentials of Significance: Concerns, Principles, and the *Numbers Game*

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ABSTRACT

Tomorrow's world is not the world of our forefathers. We will need lifelong learners and learning empowered by OBE's Life-Performance Outcomes as keys to both survival and fulfillment. OBE has evolved enormously since its founding but retained three fundamental principles – significance, alignment, and authenticity, each embodied fully in its Outcomes, its assessments, and its substantive credentials. No matter how the rationales for determining outcomes are stated – as skill-sets, life engagement, professional requirements, social expectations, philosophical principles, or all of the above - they explicitly or implicitly represent cultural values, priorities, and customs that must be taken into account if implementation efforts are to succeed. OBE's acceptance or resistance hangs in the balance. Since Outcomes of Significance are demonstrable and matter well after students graduate, they must be described in action-oriented terms, include performance tasks, embody definitive Measures of Effectiveness (MoEs), and be practiced and continually reinforced in realistic contexts. Recognizing that the significance and authenticity of any outcome defined now can only be ultimately validated at some undefined future point, educators must be willing to adapt and revise how outcomes are fostered and assessed in light of evolving external contexts. This is key to keeping outcomes relevant and empowering, which most conventional learning contexts cannot do. Ultimately both Authentic Assessment and Credentialing must replace and transcend the formidable, intrinsic failings and pitfalls of numerical or symbolic assessments, grading, recordkeeping, and Credentialing systems that provide constituents and future employers with the illusion, rather than reality, of student abilities and qualities.

Keywords*: OBE Assessment; Outcomes of Significance; Measures of Effectiveness; Numbers Game; Credentialing*

Thirty years ago, Outcome-Based Education (OBE) had evolved to the point where its leaders and practitioners recognized three fundamental things. First, if 'outcomes' were to have any beneficial

effect on students' lives, they had to be 'significant'. Hence, the term 'significance' was given a broad but distinct meaning: What really matters in the long run and 'lasts' long after students have graduated. Second, if the credentials that students carried with them were to convey the substance and meaning of those outcomes, the documentation of their abilities and accomplishments had to directly match the outcomes themselves. This 'direct matching' process is called alignment. Third, if the information in the documentation was to be valid/accurate, it, too, needed to be gathered through a process that was as equally meticulous and valid. This process is what we call assessment, and it must be both aligned and authentic.

Hence, we begin this paper with the premise that, to be authentically Outcome-Based, the ultimate exit outcomes that send students out the door into the future, the assessments of those outcomes, and the credentials that validate those outcomes must all be significant, authentic, and aligned with each other. Although very few examples of this careful matching exist in formal education systems, they abound outside of academic education in these and other notable manifestations: flight schools, SCUBA instruction, ski schools, military training, scouting merit badges, performing arts programs, Karate instruction, driver training, apprenticeship training, and professional licensure.

Moreover, and despite their diversity, these examples all align with OBE's paradigmatic essence. First, each has a clear, criterion-defined standard of learning and performance associated with each of its distinct achievement levels. Also, each level is explicitly taught as a stepping stone to an ultimate complex ability, Further, the performance standards/criteria for each level have been set/assessed/verified/validated/confirmed/credentialed by notable experts in the field. Finally, multiple/continuous performance trials are required to assure that all criteria are met.

To us the foregoing describes the standard model of OBE, which corresponds to what Spady called 'Applied Performance OBE' in his earlier paper in this issue. Moreover, it portrays the inseparable relationship among outcomes, assessment, and credentialing and supports his discussion of the 'CBO Syndrome' as a serious misrepresentation and misapplication of authentic OBE. While he identifies 'Credit-Based Obsession' as a defining element in the syndrome, he has left it to us to explain that the obsession is with credit as it is currently dispensed in education's time-based paradigm – as vague labels and numbers linked to time blocks of varying lengths. There is an obsession with credit, because credentials, diplomas, and degrees have become the essential currency used by students to negotiate their way into desirable careers and improved futures. And with the obsession comes an admonition: Don't leave school without it.

What follows, then, are guidelines for developing outcomes, assessments, and credentials of significance that are authentic and aligned with OBE's empowering, future-focused essence. Accompanying these guidelines is a paradigm shift of mega proportions – from symbols to substance – and a major warning about the distortions and deceptions in education's conventional approach to assessing and documenting learning. That approach is something we call the 'Numbers Game'.

Developing Rationales for Outcomes of Significance

Most discussions about outcomes revolve around their meaning and likely consequences, both for individual students and the society at large. Those discussions often lead to irreconcilable disputes because the discussions are premature. From our decades of experience, we believe that learning outcomes are not defined; they are derived. They come from somewhere – prior considerations – and have an underlying rationale. Until that rationale and its underlying assumptions are identified and agreed upon by all the constituents that have a stake in the likely outcome/consequences of

the outcomes, they may never be embraced by those responsible for their development or assessment.

Therefore, from our experience, outcomes are usually derived from the cultures and constituencies that those outcomes are to serve and benefit, both in the shorter and longer runs: our paradigms of life and death, and/or; our values, ideals, and priorities, and/or; our view of human potential, and/or; our perceptions and projections of the future we wish to experience, and/or; our regard for our eco-system, and/or; our attachments to tradition, and/or; cultural conventions, and/or; political pressures and expediency, and/or compelling innovations, and even thin air! Consequently, from our perspective, the outcome-deriving process requires as much clarity of focus and sensitivity to students' cultural backgrounds as the OBE instruction process does. The underlying essence of culture is whatever a people use to guide their day-to-day lives and decision making, as well as deem 'important' enough to pass down through generations. Hence, how do they (and we) address how life may unfold? Are we advocating and trying to create models of future-focused, life-performance learning that assume continuing shifts in technologies and human relationships? Or should outcomes of significance reinforce cultural continuity and paradigm stasis? Or can we actually do both simultaneously in one learning system?

Central to this issue are the assumptions, beliefs, paradigms, values, and priorities being brought to bear when intended outcomes of significance are derived and defined – which this diversity of rationales clearly illustrates. What, then, do constituents regard as the greatest needs and highest priorities in life overall, and how do those preferences serve egalitarian, ecumenical, or sectarian interests? What makes these needs and priorities significant is that they are part of an overarching architecture of behavioral and intellectual functionality that constituents believe will support and sustain learners throughout their lives.

The Cultural Complexities and Priorities of Industrial Societies

As a critical reality of civilization's industrialization (and domestication) of humanity in the past two centuries, earlier homogenous rural societies have now become highly stratified. This stratification is a natural outcome of population growth over time, combined with the frequently declared need for the efficiencies offered by industrialization. This shift supports a social architecture of free market or predatory industrial capitalism that has fostered huge economic inequalities and led to the development of subcultures separated by wealth and ethnicity.

By delegating educational functions to people outside the home or community, industrialized society has, over time, let go of, or deliberately degraded, a lot of substantive and meaningful community culture. Consequently, a de facto industrialized educational culture has come to dominate both policy-making and learning or outcomes priorities. One reflection of this overlay is that the educational priorities of the industrial laboring classes tend toward the strongly pragmatic and utilitarian pole of values, whereas the wealthier classes tend toward either life-fulfillment for those who can afford it or for high-status careers and pursuits.

Consequently, organizational constructs, e.g., logistic, production, leisure, learning, across great swaths of well-educated societies are engaged or managed differently based on the cultural differences that are represented along regional, functional, or philosophical lines. Consequently, any attempt to take a large group of people, implying a substantial cross-section of the subcultures, from a modern human ecosystem, e.g., town, city, suburb, and facilitate their acceptance of a common set of outcomes based on commonly accepted values for humanity may fail without cultural harmonization or rationalization. Here, it is worth noting that a huge proportion of the

problems and conflicts in human history have revolved around internecine feuding over startlingly minor cultural differences, e.g., variations in the Lord's Prayer in Christianity, for instance.

Harmonizing Cultural Differences and Sensitivities

In many cases, the broader functional requirements of the represented culture or sub-culture must be well understood by the instructors/institution before effective outcomes and assessment can be defined. Further, to establish a uniform or consistent approach to the instructional process across a mixed cultural environment, a degree of harmonization must occur to smooth out potential conflicts over minor details of the cultural understanding between different groups within the culture or a region where those cultures reside. A good example in the United States might be Amish and English (where English is the Amish term for anybody not Amish), belief differences (sub-cultures) within the greater cultures of Christian faith or American social culture.

In situations where OBE may encompass multiple differing sub-cultures, a cross-cultural harmonizing, rationalizing, or agreement-finding process must be implemented at the early rationale-framing stage in order to form a foundation of understandings for deriving the final outcome framework. This process must establish common, agreed-upon, and accepted understandings of the nature and acceptable steps to be taken prior to engaging in the actual framing process. Otherwise, it will be impossible to establish a single framework of outcomes that guides the overall effort.

Whether the outcomes of significance used for subsequent assessments and credentialing take form as a specific skill-set, a life performance framework, professional requirements, social expectations, or a philosophy, they are the expressed framework of a culture – a set of intentions and agreements held in common that further imply a set of common cultural values: Values significant enough, within a given group of humans, to serve as the basis for conducting daily life and to merit being passed down from one generation to the next in order to maintain the group's viability.

This cultural understanding is critical because it requires a very finely tuned cultural sensitivity in how to frame the significant outcomes, as well as a continuing awareness that is exercised throughout the learning, assessment, and credentialing process. This sensitivity is key to ensuring that major cultural requirements are maintained in how outcomes are defined and worded and how ongoing assessments of demonstrated understandings and abilities are implemented, even though those cultural requirements may only be infered in the documented outcomes.

A Rationale for Higher Educators

In our work developing rationales for outcome frameworks in higher education, a consensus emerged around a combination of their primary mission, their universal higher purpose, and their major contribution to the world. In the end, it came down to this mission statement: Develop conscientious, exemplary professionals of the highest caliber, who make significant contributions to the quality of life on the planet.

This formidable statement emerged after extensive analysis and deliberation from seven compelling direction-setting assumptions. First, in order to make a real and lasting difference in the world as influential professionals, university graduates need to be effective leaders and sustainers of change. Second, for that to happen, their leadership would have to be infused with the capacities, orientations, and qualities of true professionals. Third, true professionalism extends beyond knowledge and expertise, and ultimately reflects the essence and character of the

person. Fourth, true professionals embrace and embody principles and values that transcend self-interest, personal preferences and shallow ego needs. Fifth, true professionals are 'exemplary' individuals, setting standards for the society and its institutions that include, but rise above, the know-how and sensibilities of skilled practitioners. Sixth, skilled practitioner training may be an essential building block to professional preparation, but it currently lacks the scope and depth of the latter. Finally, true professionalism takes years to cultivate as students are molded and mentored by other professionals – especially their university professors – so that, in their careers, they can *mentor and be role models* for others.

In many ways this set of assumptions or premises reinforce the legendary emotional intelligence work of Daniel Goleman, whose key message about career success can be reframed slightly in relation to also embrace these seven statements: Sound technical training makes you an expert; unleashing your humanity and advancing in you career makes you a professional. And to this we would add: Professionalism cannot be learned from a textbook or curriculum syllabus, or assessed on paper-pencil tests. Sustained, enlightened human interaction is required.

What Outcomes Are

In his earlier article, Spady explains that the OBE movement has steadfastly adhered to the 1986 definition of an outcome developed by a team of leading OBE practitioners, namely an outcome is a culminating demonstration of learning. Within weeks, OBE leaders had explained this definition to a host of primary and secondary teachers across the United States and convinced them of the following:

1. To have a demonstration, students have to show you what they know or understand, not simply remember things for paper-pencil assignments/tests;
2. Demonstrations put mental learning into action, and proper action/application requires skill and competence, not just mental processing and a good memory;
3. Outcomes need to start with action verbs that require students to 'execute the verb' as well as know the content;
4. Teachers must teach how to do the processes embodied in the verb as well as the outcome's content and concepts so that learners can carry out the designated demonstration process fully and successfully; and
5. Assessments must 'allow' the outcome's action verb(s) to be demonstrated**.**

We wish to elaborate on the deeper meaning of this definition by suggesting that the culminating demonstration sought for students is also a declaration of intent (commitment) by educators to have all students reach that agreed-upon culmination goal. From this expanded perspective the actual outcome of this learning process is 'the result of an intention to have both students and faculty collaborate to reach a level of accomplishment agreed upon by the constituents of that system'.

In effect, faculty and students become partners in accomplishing a broadly endorsed goal that is fully supported by OBE's four operating principles, providing both parties with a clarity of focus, expanded opportunity, high expectations, and clearly mapped pathway to get to, and even beyond, the declared/defined culminating (how good can it get) level. This insight adds a new, profound transformation to the dynamic that conventionally plays out between students and faculty in conventional classrooms: A transformation from faculty as authorities controlling the learning process to faculty joining students as partners seeking to accomplish a common goal.

Essential Measures of Effectiveness

The foundational requirement of all outcomes is that they have associated demonstrable behavior or thought. Thus, any outcome will have at least one associated task and one or more Measures of Effectiveness (MoEs). Please note that they are very similar to what Spady described as Essential Performance Components (EPC) in his earlier paper. For an effective approach to understanding MoEs/EPCs, ask yourself the questions, 'What does success look like?' and 'What steps are needed to demonstrate that?'

A functional necessity of MoEs is that there are culturally significant criteria upon which effectiveness is based. If the outcome is 'consistently create and serve a good breakfast', then there will be structural criteria, that is, the order in which things are done, or actions are taken, and/or process criteria, that is, how the process is organized and managed, culturally defined qualitative criteria; that is, how well does the delivered result meet any cultural requirements, and operational criteria, that is, how the task is engaged and completed as well as the nature and scope of the results, that apply in answering the question 'What does success look like?' If the multidimensional nature of MoEs is properly observed, there is a much higher probability of outcomes being successfully demonstrated, and a socially satisfactory response to the OBE effort.

In addition, in almost all cases, successful demonstrations will be a matter of not just doing the right things, but also doing things right. Doing the right things is the pieces; doing things right is the process. It is critically important to keep in mind that effective assessment of significant outcomes is not a testing event, but a process that is deliberately tailored to the learning activity and the individual(s) of whom the outcomes are expected. This relates back to the point that the learning process is a collaborative effort between instructor and learner, and the OBE premise that all students can learn and succeed, but not on the same day in the same way.

Outcomes 'Happen' in Dynamic Contexts

The reason that OBE advocates coined the term outcomes of significance over thirty years ago is because they wanted outcomes to be derived from a clear understanding that they would be put to the test once students were applying them in real life after they had graduated. But since life back then was already changing significantly, the context challenges students faced in the future could only be extrapolated from trends and changes that had already begun in the present. The great challenge was that most of what students learned while in school was in danger of being obsolete by the time students and their outcomes finally got out the door.

We offer this observation and its following implications in the hope that enormous care is taken to base outcomes on the deepest foundational concepts and competences possible that lead to greater openness to change, heightened awareness of emerging opportunities, stronger resilience to setbacks, and an intense passion to continue learning. Why these in particular? The following reasons are provided:

1. All outcomes are transient because their validity is contextual, and the context in which they play out is always changing.
2. Even outcomes of significance are snapshots of a future desired state or capability that can only be validated by that future.

3. If the future that arrives does not fairly closely reflect the anticipated future, the original sense and substance sought in a culminating demonstration will never be adequate to address the future that does emerge, whatever that may be.
4. Therefore, both conventional education and OBE may promise certainty, but certainty is an illusion because life itself is a continuous process of creation and unfolding possibilities.

With that in mind, we perceive conventional educational processes have an inherent rigidity, and thus fragility compared with authentic OBE. This is due to its one-size-fits-all standards as well as the vast hierarchy of centralized economic, productivity, and public policy interests and officials overseeing those standards. While anticipated futures are always changing, education's standards lag far behind. But because of its inherent learner-centered focus and responsiveness, OBE has an intrinsic moment-to-moment flexibility, adjustment, and capacity for adaptation as any anticipated future gets closer to each day's present. Because outcomes of significance are intrinsically linked to the context of the moment, their demonstrations of competence are only valid in the context of that particular moment, which itself is always approaching a different anticipated future. Hence, OBE's momentum toward continuous improvement inherently fosters students being and becoming ever more flexible and adaptable.

You Cannot Assess What You Have Not Defined: The Fundamentals of OBE Assessment

However, assuming that cultural harmonization was accomplished and outcomes of significance were identified, then those outcomes become the intrinsic basis for evaluating or assessing the effectiveness of the learning process – continuously, from the moment it begins. This includes assessment of its effectiveness for the learner as well as the effectiveness and durability of the outcomes themselves. Here, we must emphasize that assessment is about gathering evidence directly related to the demonstration or absence of an outcome's MoEs described earlier – the outcome's fundamental components and building blocks. It is they that provide the tangible, visible, in the moment, and continuous evidence that both teachers and students can use as they continue or amend the learning process and improve later demonstrations.

This OBE form of continuous assessment is unrelated to passing judgments, recording grades, or awarding credit on students work. Hence, it is best thought of as targeted or constructive assessment rather than summative or evaluative assessment. It is based on the simple premise that the sooner that clear, substantive feedback can be given to the student about what is observed the more they will benefit from it and the better their learning process will flow. We have found this to be true for all kinds of performance learning.

Fundamental Principles of Assessment

Authentic, aligned, relevant, and constructive assessment is fundamental to everything that OBE represents. Our experience shows that the impact of these qualities can be optimized when these six fundamental principles are applied to assessment, much like OBE's four learning system principles are applied to instruction.

1. Assessment is a continuous process of evaluation, NOT a series of points in time at which tests are administered. It starts when the activity starts as students begin asking themselves, how well am I doing on this?

2. Assessment is always and only based on clearly understood outcomes. If the assessment process reveals the need for amplifying or adding other outcomes, those outcomes are duly documented, discussed with all affected parties, and applied going forward.
3. Assessment must be comprehensive, which is to say it must account for the specific and conditional circumstances of the learner, the constraints of the learning and performance environment, the functional requirements of the pertinent skill or ability, and level of instruction available/presented in regard to that skill or ability.
4. Assessment requires a level of engagement from the instructor equal to or greater than the level of engagement of the learner, always asking: How well is what I'm teaching coming across to the students?
5. Assessment is in play until the culminating demonstration is successful. This is consistent with Bloom's notion of formative assessment and OBE's Expanded Opportunity Principle. The final function of assessment, then, is to document and determine that a culminating demonstration has taken place and is likely to be carried out the door into life.
6. All assessments use MoEs – Measures of Effectiveness. MoEs are identifiable, demonstrable criteria that lead to a successful culminating demonstration. They are learning 'building blocks' that provide quantitative and/or qualitative units of measure that allow instructors and learners to understand their progress.

Since some students are reticent to demonstrate any knowledge or understanding until they can be certain of mastery, teachers are wise to assure them at the start that mastery is not expected in the early stages of new learning. They can explain that they themselves need to learn the ways individual students learn and perform best in order to conduct both formal and informal assessments in ways that genuinely promote learning improvement and success. The fundamental goal here is for learners to get as good as possible at what's deemed important, without carrying undue anxiety about top performance along the way.

You Can Average Numbers, But You Cannot Average Outcomes

Over the years students get increasingly socialized by educators into believing that the scores and percentages they receive for what they learn are more important than the learning itself. This all-pervasive illusion increases intensively during their high school years as students compete for the highest rank in their class possible in order both to qualify for university admission and to impress the admissions committee. That obsession is then moved up the scale for four or more years as universities and graduate schools routinely compel students to do the same things to impress prospective employers. This is the greatest deceit in educational credentialing, and it all comes down to two numbers that both fit into very small spaces on a transcript with countless other very small spaces.

Therefore, if it is all that critical, then how is a student's rank determined? Rank is often determined through students' Grade Point Average (GPA), of course, which is based on all the scores or grades they have received in all of the courses they have taken and then given a grand average. This number is very important that it is often calculated to the third decimal place in order to give it the aura of scientific precision and, thereby, justify the ranking. Once that is done, all the GPAs of all the students in one's reference group are compared and their relative ranking is determined.

Determining G.P.A.

Since individual GPAs are critical in determining rank, it is important to examine how they are determined. In most schools, this is done by adding up and averaging all the grades students have received for every non-equivalent thing they've ever done in every non-equivalent course they have taken over a four-year period. With this information in hand, let us go back to the definition and implications of an outcome of significance and this process critically.

First, since outcomes are defined by words not numbers, and since no number, score, percentage, or ratio is a demonstration of learning, none of this is about outcomes, and they cannot be averaged because they are words. Second, all of these scores and numbers are based on non-equivalent kinds of tasks in non-equivalent kinds of courses, even though they are assumed to be of equal value to justify their role in calculating fair/accurate GPAs. Third, the non-equivalent instructors in those non-equivalent courses simply assign numbers to the non-equivalent tasks, very likely based on non-equivalent criteria in non-equivalent ways, although no task is inherently 'worth' a number, even though the 'ultimate' number – 100 – is contrived as well.

Therefore, from our perspective, this entire 'enterprise' lacks substance, except for the very general names given to the courses taken. The kindest things we can say is that this contrived system is very clever that generations of intelligent people across the world have accepted it without protest. They have accepted its layers of mathematical assumptions, manipulations, and symbolism as a credible way of defining and operating credentialing systems that hold millions of people's lives in the balance every year. Consequently, we are choosing to highlight below several additional myths that uphold this bogus Numbers Game, which is exposed in the following diagram (Figure 1).

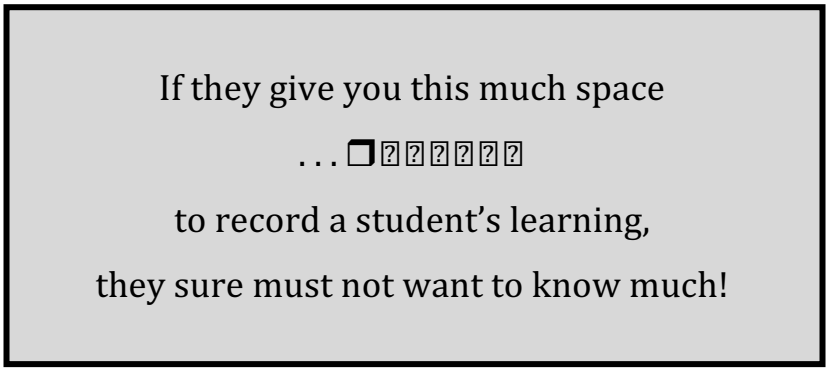

Figure 1. The Numbers Game

Dispelling Major Myths Underlying the *Numbers Game*

Given the strangle hold that today's numbers-based/symbols-driven credentialing system has over students and educators, we will explicitly address seven key Myths about the *Numbers Game* that go unchallenged decade after decade, as follows:

1. Numbers are measures.
2. Everything is worth 100 points.
3. All points are created equal.
4. Points define standards of success.
5. Points define essential learning.

6. The more points, the higher the achievement.
7. Lots of points assure future success.

Although highly interrelated, we will expose the reality about these seven myths one at a time.

Myth 1: Numbers Are Measures

As noted earlier, numbers are not measures of learning, criteria are; and criteria are defined by real words that describe the actual components of the desired learning or performance. Numbers are an artificial code – proxies – that we attach to the elements of a performance. Then, after adding up and manipulating the numbers, we represent the numerical solution as if it were a measure of the learning. At best it is a grossly inaccurate proxy. But without this grounding myth, the Numbers Game could not exist.

Myth 2: Everything Is Worth 100 Points

This second great myth makes the Numbers Game possible. The blunt truth is that nothing is worth anything unless we attach value to it, and the implementers of the Numbers Game have decided to attach 100 points worth of numerical value to everything that moves, no matter how different it is from anything else that gets 100 points: assignments large and small, tests large and small, presentations large and small, projects large and small, performances large and small, homework on time or late, attendance and deportment, attitude and effort, and on and on it goes. Everything is calibrated against, or subtracted from, 100 as if it were a magic number.

Given this, have you ever wondered why the number of questions to be answered on assignments and tests almost always divides into 100 evenly? It is so that the points can be distributed easily, not because there are four equally important or significant things that constitute an adequate understanding of something, or five, or ten, or twenty. It is so that the arithmetic comes out evenly when teachers take points off for mistakes. Because of these 100 points and the deductions made from them, the most asked question testing days is 'What did you get?' (How many points were awarded), not 'What did you learn?'

Myth 3: All Points Are Created Equal

Because points are ordinal numbers, educators assume that they differ from each other by equal orders of magnitude. That makes 10 just as different from 9 as it is from 11. And because you can perform any kind of basic operation with ordinal numbers that you desire, they can be added, subtracted, multiplied, divided, averaged, compared, and ranked against each other just about any way you wish.

Because people are led to believe that numbers are measures and that everything is worth 100 points, educators feel safe in attaching ordinal numbers to components of learning. This segment of content is worth these many points, and this specific skill is worth that many. This wild leap of faith works as long as you think in numbers, but it completely breaks down when you think in substance. That is why no one can figure out the degree of numerical value between naming the vertebrae in the spinal column and naming the tallest mountain in South Africa – or how to assign different numerical values to the verb 'describe' as distinct from 'design'.

Nonetheless, educators proceed undaunted by substantive reality, assuming that these 10 points (whether missing or present) are of the same value as those 10 points or some other 10

points somewhere else. If they are right, then they are justified in making equal achievement trades between the capital of Italy, the longest river in South America, and the number of known planets in our solar system, because each is an item on a ten-item test, and each item is worth 10 points. Note, however, that knowing the capital of Italy can be 'worth' twice as much as knowing the capital of New York (5 points) if the latter question is on a twenty-item test.

But this is only part of the dilemma created by Myth 3. The real truth is that one particular point is actually of incredibly greater value than all of the other 99. It is the point you need to go from fail to pass. It might be the 60th point, or the 70th, or the 80th, depending on your country's customary passing standard, but there is no doubt that it is the most valuable and most unequal point of all. The point that moves you from a C to a B is also much more valuable than most of the others, as is the one that moves you from a B to an A. Thus, in terms of impact, not all points are created equal at all, regardless of the naive assumptions we make to the contrary.

Myth 4: Points Define Standards of Success

Every educational jurisdiction in North America has a numerical standard for passing and failing. In most U.S. districts, it is the difference between 69 and 70, but in some districts, it is 59 and 60, and in others, it is 79 and 80. In Canada, where several provinces follow the British example, it is 49 and 50; but in the United Kingdom, it is rare for anyone to be awarded more than an 80 for anything, no matter how good it is. Therefore, what is correct, proper, accurate, realistic as a standard? No one knows. We just make it up and compel students to live with whatever our particular number is.

At 70, students still cannot do 30 percent of what is required successfully, but it is a pass in thousands of places. Whether it is too lenient all depends on what the 70 and 30 are all about. If airline pilots only had to get 70, we would have hundreds of crashes a day – until we ran out of pilots, planes, and gullible passengers willing to fly. And if they had to get 80, that would still leave us with disasters everywhere, especially if the missing 20 points were the part of the flight test that covered safe landings. So would 90, 95, and even 99. Now apply that to your own success as a driver. Allowing yourself two trips a day for a year, how many accidents would you have at 95 percent driving accuracy each year? Over 36. At 99 percent? Over 7. In the United States, that would qualify you to participate in what we call a demolition derby.

Hence, if the foregoing realities seem discouraging, you might want to get rid of the Numbers Game altogether. How? Start by asking faculty, administrators, and credentialing officials: 70 of what? 80 of what? 95 of what? What is the 'real' measure?

Do not be surprised if no one can give you a logical or persuasive answer you because you are asking about substance, and they are doing numbers. The two do not match – water and metal. Two different paradigms – no connection. But your questions will get their attention and expose the need for creating a criterion-defined standards system.

Myth 5: Points Define Essential Learning

One example will suffice to dispel this myth, and to do so we will set our success standard at 80, which is pretty high by schooling norms. Imagine that it is Friday, and a ten-item test in

Biology awaits us. Our teacher has been reminding us all week about how 'essential' this information is to our ability to progress in Biology, and this test will prove it. This is a big one.

What we need to score in order to pass is 80. 80 is essential. This is a ten-item test, which means each item is worth ten points, so we can miss two and still pass. Okay, here goes: Do we need to know the first item in order to pass? No. It is not essential; we can miss it and still pass. Do we need to know the second item to pass? No; it is not essential either. We can miss it too, and still pass. Well, what about the third? That depends on how we did on the first two items, but by itself, no.

Success on this test is 80 points. What does it take to get 80 points? We must answer any eight items correctly. Of the eight, does it have to be the first? No. Of the eight, does it have to be the second? No. The third? No. Not any of them in particular. when you're playing the Numbers Game, and the passing score is less than 100, no item is essential. There is no particular thing you have to know in order to succeed. However, you do have to know enough non-essential items to succeed; eight of them, in fact – any eight, and there are 32 different ways you can do it. Consequently, nothing on this test is essential to know, but knowing enough non-essential items is mandatory. Our teacher mistook essential to mean enough, and it happens all the time when you play the Numbers Game. Therefore, please remember when you design a ten-item test with a passing score of 80: all 10 of those items are assumed to be of equal value, and any one of the 32 possible combinations of right and wrong answers that yield a score of 80 is assumed to be an equivalent level of 'essential' performance.

Myth 6: The More Points, The Higher The Achievement

Earlier we defined achievement as 'attaining a new higher level of something', which means 'advancing to a new level' in either mental processing, the execution of observable processes, or both. Now, let us apply this definition to the situation facing two typical learners. One enters the course with a strong background in it. She already knows a lot, so is ready to perform at a high level at the beginning. The other has very little background at the beginning but wants to learn it. He starts the course at a much lower level of readiness.

Now, both the course and the Numbers Game begin, and the higher-level student immediately begins piling up perfect 100's because she already knows a lot of it, the new material is familiar, and her rate of assimilating the new concepts and processes is quite rapid as a result. The other student, on the other hand, is struggling to get his bearings and things are proceeding slowly for him. He gets poor initial test results and many permanently-lost points, but he persists. After some months of determined effort, he is getting higher and higher marks on his assignments and tests. He has moved to higher and higher levels of understanding, competence, and demonstrated performance.

Finally, after many months of arduous work, he does it. He gets his first 100, and then another and another. Meanwhile, his counterpart has been working conscientiously too and continues to get straight 100s. At the end of the school year, they take the final exam and both get 100s. The teacher is elated at their "achievement" and averages up their final grades for the year. She gets an A for her straight 100s. He gets a B for his very mixed record. Who, then, by our definition, 'achieved', i.e., raised her/his level, the most? He did. Who got the fewest points? He did. Who got 'robbed' by the Numbers Game? You only get one guess, and it is worth 100 points.

Myth 7: Lots of Points Assure Future Success

The Numbers Game is a massive reward and punishment system that Alfie Kohn describes and decries in his 1993 book Punished by Rewards. As Spady noted in the foregoing paper when discussing the INpowerment paradigm, school is a place where educators and students are locked in a dynamic of control and compliance. Because of attendance requirements, students have to be there whether they want to or not, and the teachers have to get them to learn the things in the official curriculum, whether the students find them interesting and valuable or not. As it turns out, points, grades, and credit are the commodities of exchange in this dysfunctional dynamic: If you do what I ask, you will get points and credit for it. Without points and credit, you are in deep trouble, and would not get the credentials you need moving forward. But with credentials, you will be called a success, even if you are not. Seen more closely, it is a trade-off between compliance and avoiding future humiliation.

When you add the ingredients supplied by these seven myths, students come to believe that points, scores, and grades are their achievement, success, and passports to the future. For those highly motivated to move on into higher education, maximizing their points is one of the key ways of enhancing their chances of attaining a high GPA, a high class rank, and admission to university or a promising job. They do this by protecting their GPA during their final year. It is done by avoiding the most challenging courses where the risk of not getting an A is high, and settling instead for easier alternatives where A's are more likely. Their competence or achievement does not increase, but their points do. That is what ultimately matters when learning and credentialing degenerate into a Numbers Game.

Our Culminating Assessment

In sum, the Numbers Game, otherwise known as assessment in the conventional educational environment, is a generally accepted but wholly inadequate analog representation of real accomplishment that functions as a substantial distortion, and distracts from or distorts real accomplishment. Further, it serves to perpetuate a lack of adaptive responsiveness and preserves an alternative economy, even a 'black market' of sorts, in numbers, and pre-disposes the educational system to corruption, rather than sustaining and maintaining the primary focus on actual accomplishment of future functional skill and ability.

Adaptive, flexible, aligned in the moment authentic assessment, as practiced in OBE, overcomes all of these issues and establishes the basis for authentic achievement and the culminating demonstration of aligned reality. Through it all, big questions remain - Should we create models of future-focused, life-performance learning, or reinforce existing cultural priorities and continuity? Or can we do both simultaneously? Since awareness and sensitivity to local priorities may diverge from macro-scale imperatives and preferences, none of which may reflect the actual changing context of life as it unfolds, OBE initiatives will have to judiciously balance these divergent pressures if they hope to be successful and advance humanity's well-being and future.

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Bionotes

JOHN STROHL is an Environmental and Climate Science researcher and natural methods farmer in Ohio. This follows a four-decade career managing a diverse array of hands-on, life-and-death roles and increasingly complex responsibilities in the U.S. Navy and Army. His day-to-day actions were *a parade of continuous formal and informal assessments* (both received and conducted), exactly as prescribed by OBE, as a matter of official procedure and because the outcomes being evaluated were so consequential to the welfare of countless others. From this he acquired a deep understanding and appreciation of authentic, aligned performance assessments. In the process he experienced the words 'Outcome Based' and 'Significant Outcomes' from a far more tangible and realistic perspective than what standard education practices offer today. His future-focused, 'big picture' view of the world is reflected throughout this paper.

WILLIAM SPADY remains the energetic, creative catalyst for OBE implementation and evolution across the world after five decades of commitment to this concept. His ever-unfolding insights about the transformational potential of OBE are reflected in ten professional books and dozens of published papers. He agrees fully with John that education is long past due for a paradigm shift that transcends conventional practice and focuses on the enormous challenges facing humanity. Together they agree that it's time for education to stop pretending that scores, points, percentages, and averages are either 'effective measures' of meaningful learning or 'adequate functional criteria' for what empowered living requires.