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ASSESSMENT OF STUDENT ACHIEVEMENT AND LEARNING, WHAT WOULD DEWEY SAY? A 'RECENT' INTERVIEW WITH JOHN DEWEY

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Running Head: Dewey on Assessment

Abstract

The thinking of John Dewey is alive today as it was 80 years ago when he was immersed in the debate over dual or unitary educational systems. Dewey opposed the efficiency proponents of the time, claiming their plans for separate vocational and liberal studies were shortsighted and "undemocratic". Dewey's arguments for a unitary system, a system that integrates vocational and academic curriculum, are being debated today as they were in the early part of this century. Key to a unitary system is an assessment system that measures not only knowledge and facts, but also the application of knowledge as well as the impact of experiences from work and life. This article explores Dewey's view of educational assessment by means of a present day interview. Such a format permits his views to be directly linked to current issues and also allows a sprinkling of humor.

Educators today reflect on the wisdom and vision of John Dewey as much or more than they did almost 100 years ago when Dewey began his writing and speaking about the role and future of education in society. John Dewey was a philosopher and educator, a former high school teacher, Director of the Chicago Laboratory School and college professor. He was a prolific writer whose views are as relevant and discussed today as they were in his time. His thinking has profoundly affected school curriculum, then and now. In

particular, his position on the emerging role of vocational education in American schools forced consideration of "learning by doing" for all students. He felt that students would experience a fuller education, and society would experience greater freedoms, if vocational and academic curriculum were unified rather than separated. Dewey argued that a separate curriculums, as we have them today, "result in a typically 'bookish' education for one group and narrow trade training for the other" (Kliebard, 1986, p. 147). Consequently, Dewey felt that separate vocational and academic programs further divided the social classes, a proposal he called "undemocratic". Dewey therefore regarded the Smith-Hughes Act, which initiated separate vocational curricula in schools, as symbolizing a conflict between educational and industrial ideals.

Background

John Dewey was also a psychologist with humanistic views of individual self worth and self determinism, which he expressed in one of his first essays, "Psychology" (Dewey, 1887, 1967). It is important to note that Dewey was very attracted to Hegelian thinking in his early years, but later in his career formed his own brand of social or "functional" psychology. In Hegel, he was confronted with the concept of dialectics, or opposing forces, which seek synthesis. This notion was very meaningful to Dewey, but Hegel later came to be too "static and concrete" for Dewey. Dewey's idea of synthesis become more dynamic, more active. He came to believe that even a synthesis of "static and mechanical categories distort what actually occurs in human behavior and experience" (Bernstein, 1966, p. 20). Consequently, he came to believe in an "organic coordination" in which the conflict of dialectics are naturally "reconstituted" into a whole.

Dewey viewed schools as primary vehicles for such reconstitution of individual and societal conflicts. He considered schools to be the vehicle for individual experimentation and self realization, and through that process, schools would become the chief agent for social change. Therefore, schools, and the educational process generally, would be the centerpiece for the resolution of Hegel's natural dialectic between the social classes. As this philosophy emerged at the height of Dewey's career, Dewey became known as a "reconstructionist" philosopher because he sought a vision to resolve the dialectics that were clearly evident in the application of the scientific method in industry and education during the early 1900's. At this same time, education was also adopting scientific management principles, striving for maximum efficiency in school operations and pedagogy. Dewey became a pragmatist, left Hegelian ideas, and considered the dialectic that separated classes of people at the time as an opportunity for education to achieve reconstruction in society. He saw a natural humanistic evolution of the dialectic to a classless society of individual freedom and social democracy through progressive, unitary and life long education.

Education in Dewey's time was in a period of profound transformation. Up to this time, education had been very classical, preparing young people for the genteel life of the upper class. High school graduates were likely to enter professions of law, medicine, business management, teaching, etc. The courses in high school and the methods of teaching were fairly abstract and not related to real life. Students who were bored with such book work, or who had to work to help support the family, soon dropped out of school. Many of these young people went back to the family farm or found productive work in the big city factories.The Proceedings of the National Association of Manufacturers (1905) reported that "eighty percent of our public school pupils drop out of the schools before attaining to the high school and 97% of all pupils drop out before graduation from high school" (p. 142). Social problems abounded. Delinquency, crime and poverty were on the rise. In addition, huge waves of immigrants from northern and southern Europe were coming to our cities looking for work and education. The nation was rapidly becoming an industrial society from an agrarian society, so young people were leaving the farm for the factory. Compulsory education laws were passed. The effect of all this was that education was looked upon as the solution to society's ills, and education was ill equipped to deal with these problems with the kind of classical education it offered.

A very popular solution to the problem of delinquency, student boredom in schools, and the efficiency needs of industry was a new concept called vocational education. Led by David Snedden and his protégé, Charles Prosser, the Smith-Hughes Act was passed in 1917 to provide federal funds to support vocational education. The legislation supported a dual system, one track was for general or classical studies, and the other track

was for vocational or manual training. The law provided that the programs were to be completely separate. Vocational education was viewed by the efficiency advocates, and by many progressives of the time, as a way to meet individual needs of young people uninterested in general education, and simultaneously meet the employment needs of industry for skilled labor for growing factories. Such a dual system of separate vocational and general education was also viewed by efficiency advocates as curing social ills because it reduced costs to society by utilizing wasted human resources and training productive workers. To the surprise and disappointment of many efficiency advocates of the time, John Dewey, also a progressive reformer, objected.

Our national economy was booming at the time, and business and industry leaders were very influential. The way to make more money was to cut costs and become more efficient. Social efficiency, or scientific management, became popularized in industry and education. Frederick Taylor's publication, Principles of Scientific Management (Taylor, 1911), provided a systematic way to run a business in the most efficient manner. It detailed time and motion studies and provided the rationale for such innovations as the assembly line, which revolutionized the auto industry by making cars affordable to the general public. At about the same time, E. L. Thorndike published Educational Psychology (Thorndike, 1913) which explained human learning as a bonded connection between a stimulus and a response. This theory had great attraction at the time because it clarified something as complex as human learning into detailed units that could be understood and measured. Thorndike's learning theories ultimately lead to the testing of student achievement in schools. Scientific management had reached the point of measuring the efficiency of the human mind as well as measuring the efficiency of the shop.

The following interview with John Dewey will probe into his psychology. Given his Hegelian roots, given scientific management and social efficiency in industry and schools, the legislated separation of vocational and general education, and the social and economic conditions of his time, I will attempt to isolate and expand upon Dewey's views on the role, responsibilities, limitations and future in measuring student achievement and human potential. Despite his death in 1952, I will conduct this interview in 1996 so that Dr. Dewey can react to the contemporary issues in student assessment.

Interview

MH: Thank you for granting this interview. Your followers and admirers are anxious to hear what you have to say to us today about current issues in testing and assessment.

JD: I appreciate the opportunity. It's been a long time since I've said anything.

MH: First of all, Dr. Dewey, how did the testing movement and the need to assess student achievement get its start?

JD: In a broad sense, we have assessed student achievement, growth and development since we started teaching students. In the process of instruction itself, teachers have always made judgments about how well students are progressing. How can any competent teacher help but make evaluative judgments about student achievement when they observe students in the learning process? The key to good assessment is simply providing feedback to students about their achievement and their potential so that they can advance to new stages in their growth and development. To do this well, teachers must know their students well. They must present opportunities for student learning, observe when they have achieved a satisfactory habit of thinking or doing, and then present additional opportunities for new habit formations. This is the purpose of assessment and instruction -- to help students achieve new and higher level habits.

MH: Some of what you're saying sounds very contemporary and some sounds very new to me. I've never heard personal habits associated with assessment. Please explain.

JD: The primary aim of education is to reform society to greater democracy through the education of its citizenry. Freedom and democracy in society require freedom and self direction of the individual. This is

accomplished through stimulating personal growth, which is a succession of habit formations. Habits are not "ruts" to climb out of, but adjustments to one's environment. Habit formation requires that the student have power to learn from his or her experiences so that new habits might be learned. This is a significant aim of education. As I once stated in my address before the American Psychological Association (Dewey, 1900), children are constantly engaged in forming habits rather than using those already formed. Let me quote from my address: "The child is busy in the formation of a flexible variety of habits whose sole immediate criterion is their relation to full growth, rather than in acquiring certain skills whose value is measured by their reference of specialized technical accomplishments" (p. 107). Therefore, habit formation is accomplished through growth, and I mean full growth not just acquiring certain skills. Flexibility, rather than rigidity, is the key to habit formation. The role of assessment, therefore, should be to interact with instruction to help the child realize full growth through successive habit formations. "Active habits involve thought, invention, and initiative in applying capacities to new aims" (Dewey, 1916, 1980, pp. 57-58).

MH: We hear a lot today about the integration of instruction and assessment as opposed to assessment being a separate experience in schools. Many writers argue that assessments should be "authentic", that is, relevant to real life. Is this notion consistent with your idea of growth and habits?

JD: Yes, it seems to be. I've never heard of "authentic" applied to assessment, but if it means related to real ongoing life in society, then I'm all for it. The larger question, it seems to me, is the authenticity of instruction. There should be a three-way unity of instruction, assessment, and real life experiences.

MH: Could you comment more on the use of assessments in instruction?

JD: All assessments of student progress, if provided as feedback and integrated into instruction, should help the student to stimulate growth and form new habits. Even the results of mental tests that emerged in my day, and which you still have today, can be feedback to students. The challenge is to understand them deeply enough to know that they measure only certain skills, and therefore represent only a partial contribution to full growth. Achievement tests which are used in education are helpful if used to classify students in order to help clarify and promote student growth. If they are used to facilitate a decision that limits options and opportunities for students, that would be counter to the goal of education in promoting individual freedom and social democracy. A true authentic test, then, would serve that educational goal. Consequently, you can't have a test authentic to life until you also have curriculum and instruction that is authentic to life.

MH: How is that possible?

JD: We actually had a chance back in 1917 to reform education to make curriculum and instruction more authentic, but we made a serious mistake with the passage of the Smith-Hughes Act.

MH: The Smith-Hughes Act was landmark legislation which brought huge amounts of federal funding for vocational education, which met the needs of a large proportion of our student population at the time by training them for work and, therefore, meeting the needs of industry and society as whole. With all due respect, how can you characterize that as a serious mistake?

JD: You sound like Snedden and Prosser and others in my time who were also trying to reform education. The problem is that they were more concerned with short run efficiency -- short run efficiency for industry, not long run benefits for education and society. Yes, we had educational and social problems at the time, and the so-called "social efficiency" advocates were well intentioned. The efficiency which they advocated was the rage at the time and was very seductive. They couldn't see the forest through the trees. They couldn't see that education, not industry, is an instrument of social reform. An "authentically" educated populace, to use your terminology, will transform industry and society. By acquiescing to industry through a totally separate vocational education system, controlled by the captains of industry, that just trained workers, educators allowed industry to transform education for industry's short range profits. As I once wrote in the New Republic , "The kind of vocational education in which I am interested is not one which will 'adapt' workers to the existing industrial regime, but one which will first alter the existing industrial system and ultimately transform it" (Dewey, 1915, p. 42).

What I'm saying is that a truly authentic curriculum is integrated and unified as much as possible. In 1917 we had a chance to integrate general and vocational education in a unitary system that would widen the opportunities for all students. Those students who are inclined to pursue academic subjects would be exposed to applications of their learning through vocational experiences. Those students who are inclined to pursue more manual subjects would be exposed to subjects, and other students, that would cause them to reflect on the broader significance of their manual experiences.

Industrialists at the time could not foresee the need for such an enlightened and flexible worker. They were efficiency minded, only looking for skilled labor for their factories. In Hegelian terms, Snedden and Prosser were arguing for a widening of the social dialectic. I was hoping for a social reconstruction, unifying society from a unity in education. Such a reconstruction would bring about social reform by giving industry a more enlightened and flexible worker to keep pace with industrial changes, it would give the individual more opportunities for personal growth by achieving higher level habits, and would give education more authentic curriculum in our schools which, as I noted before, is foundational for a truly authentic assessment. Did I answer your question?

MH: Indeed. But am I to presume that you have no use for efficiency in education?

JD: Absolutely not! I consider efficiency in human terms -- not in financial terms.

Waste is inefficiency. We had plenty of waste in education in my day and suspect you do today as well. "All waste is due to isolation. The kind of isolation I'm talking about is the isolation of the school from the larger society. The unity of school with industry, the unity of school with the home, and the unity of school with all aspects of society enhances learning, thus making that learning efficient (Dewey, 1899, p. 60). As I said in School and Society:

> The great waste in the school comes from the child's inability to utilize the experiences he gets outside of school in any complete and free way within the school itself; while, on the other hand, the child is unable to apply in daily life what he is learning at school. That is the isolation of the school -- its isolation from life. (Dewey, 1899, p. 67)

Isolation is a great enemy of life. Isolation forms rigidities that separates social classes into stereotypes, races and castes. Creative learning, however, functions best where there is a free interplay among individuals in society. Any shortage in that free interplay is an element of waste or inefficiency. In addition, let us not forget that there is inefficiency and waste within the administration of a school. When Kindergarten is isolated from the rest of the elementary school, and when the elementary school is isolated from the high school, we have waste and inefficiency. Today I believe you call such attempts to unite these parts "curriculum articulation". However, I believe that "the only way to unite the parts of the system is to unite each to life" (Dewey, 1899, p. 67). Paradoxically, I argued against the social efficiency advocates of my day in advocating a unified vocational and general education system for the sake of efficiency. Snedden and Prosser couldn't understand this.

MH: Since you brought up Snedden and Prosser, I am aware that both of them documented specific beliefs in an attempt to clarify their position on vocational education. Snedden listed 12 Doctrines of Social Efficiency.

JD: Yes, and nearly all of them call for a limitation of freedom and democracy. In particular, his statement that "society is properly differentiated into socioeconomic classes" and that "it is the responsibility of schools to determine the 'probable destiny' of the student, then to fit the child to that destiny" (Snedden, as cited in Camp, 1983, p. 13) is utterly repugnant. Snedden felt that testing and guidance were an instrument of educational control over the child by using tests to fit students into their "probable destinies". He felt that sorting procedure should begin in the new junior high schools. Ironically, Snedden felt this would increase efficiency for students and industry. Snedden viewed such efficiency as more important than preventing social stratification. He believed that "once students were fitted to their place in life and conditioned to

accept that place, then they would have such an intelligent understanding of authority as to make the exercise of arbitrary authority unnecessary" (Snedden, as cited in Camp, 1983, p. 13). Thus began the tracking of students into educational classes, which would eventually track them into social classes as adults. Obviously, test results, by reflecting social and economic status, would "scientifically" sort students into social classes, thus maintaining the status quo. I believe remnants of that tracking system still exit today.

MH: They do. In fact, some states today require the administration of standardized knowledge and concepts tests to secondary students to help determine who would be best fitted for a vocational track and who would be best fitted for a college track.

JD: Good Heavens! Pardon the expression.

MH: Prosser listed 16 Theorems some on which have meaning for assessment. Let me reflect on a few. Prosser stated that vocational education should be a "replica of the environment in which the learner must subsequently work", and that it must "train individuals to meet the demands of the market" (Prosser, as cited in Camp & Hillison, 1984, p. 15). If I understand what you just said, this is not an example of an authentic and integrated curriculum which you envisioned.

JD: Correct. Prosser's concept of matching curriculum to the environment of the workplace to meet market demands is extremely narrow. This is not authentic, or relevant to life at all, except by the most expedient and cost effective definitions. As I said before, a true authentic assessment is one that is connected to a robust curriculum, reflects all aspects of adult life, helps the student grow into advanced habits, and ultimately stimulates social and industrial progress.

MH: Interestingly, Prosser said that vocational education should help students form "right habits of doing and thinking ... to the point that these habits become fixed to the degree necessary for gainful employment" (Prosser, as cited in Camp & Hillison, 1984, p. 15).

JD: Not my idea of habit formation. Habits are never fixed. Nor are they formed for the purpose of employment. This theorem is the ultimate of control of a student, and the antithesis of individual freedom and social democracy.

MH: How would industry benefit from a student so broadly trained?

JD: Jobs become obsolete, and they are becoming obsolete very quickly in your world today. Employers desire to have employees progress and advance within their organization, and to discover creative ways to accomplish their work. The skills needed by farsighted businesses are adaptability, flexibility, resourcefulness, creativity, and the like. To teach such habits, schools must provide opportunities for students to reflect on their work so they can improve their work and themselves. As I stated in The New Republic:

This sense of being scientifically up-to-date does endless harm. It retards the creation of a new type of education because it obscures the one thing deeply needful: a new personal attitude in which a teacher shall be an inventive pioneer in use of what is known, and shall learn in the process of experience. The further demand is for human qualities of honesty, courage and invention, which will enable one to go ahead without the props of custom masquerading in the terminology of science. (Dewey, 1922a, pp. 90-91)

MH: What does that concept say about assessment?

JD: The mental tests of achievement and the vocational interest and aptitude tests that emerged in my day became standardized, and as such, fit right into this concept of "right habits of doing and thinking". These instruments attempted to isolate skills, aptitudes and interest, not for the purpose of informing, clarifying and providing feedback for the student, but for the purpose of predicting success on a job. They were used by vocational counselors and employers to sort and select students efficiently into categories, so that these students might be most efficiently used. This practice has the effect of dividing society into social classes, which is the opposite of what education should do. Walter Lippmann said it best, "Tests are capable of

rendering a valuable service in classifying school children, but they are in great danger of becoming an 'engine of cruelty' by being turned into a method of stamping a permanent sense of inferiority upon the soul of the child" (Lippmann, as cited in Terman, 1922, p. 118). Tests worked well for that selecting and sorting. The problem is that this sorting process stunted growth, thus limiting the full potential of students. It also fragmented the curriculum in both general and vocational education. We teach what we test, and if we test for very narrow purposes, such as for employment, then we align our curriculum to that purpose and fragment our curriculum into the isolated items on our assessment instruments.

MH: Prosser also stated that there is a "minimum of productive ability which an individual must possess in order to secure or retain employment in that occupation" (Prosser, as cited in Camp & Hillison, 1984, p. 15). This sounds like it would lead to what we experienced a few years ago in minimal competency testing. Do you agree?

JD: Absolutely. Again, that statement is another example of how education was perverted by industry and the efficiency advocates. Such thinking leads, as you noted, to minimal competency testing and also to the entire accountability movement in your era. To suggest that education was intended to ensure certain minimal skills of students for industry, suggests that curriculum and instruction are to be fragmented into measurable isolated units that represent industrial minimums. "Competency-based education, a hallmark of vocational education (in your era) examines the existing industrial 'regime', mimics it, and teaches students only those specific tasks required of entry level workers" (Camp and Hillison, 1984, p. 16). The destructive impact is two-fold. First it reduces curriculum to the lowest minimum. Then it fragments curriculum into measurable pieces. This might make sense for economy-minded industrialists who look only at the financial balance sheet, but these minimal competency tests limit human growth and potential, which is central to renewed habit formation. So basically, Prosser's theorems perpetuated the status quo by training students for industry as it presently existed. The same was true of testing. It held students in social classes. As I stated in the New Republic:

> Testing represents a procedure that in the name of science sinks the individual in a numerical class; judges him with reference to capacity to fit into a limited number of vocations, ranked according to present business standards; assigns him to a predestined niche; and thereby does whatever education can do to perpetuate the present order" (Dewey, 1922b, p. 62).

MH: Didn't the theorems help make education a little more accountable to society?

JD: In only a limited sense. I do believe we need standards of proficiency in education so students can ultimately meet the demands of society and work. To this extent accountability is good. However, accountability, as expressed in minimal competency testing, can cause us to focus on minimum expectations for students. When we lower expectations for students based on information from tests designed to sort students, we perpetuate the social status quo. Don't forget, educational accountability is an outgrowth of the scientific management era in my day. The word comes from the profession of accounting, which of course, deals with isolating and measuring all aspects of an organization to reduce costs. The social efficiency advocates of my day embraced it and the politicians of your day required it. Educators are accountable like everyone else. However, educators are accountable for the aims of education, not for the short run profits of industry. A true authentic test, then, should attempt to reflect those aims of education.

MH: We have talked about the social efficiency advocates of your day, who gave us the kind of vocational education we have today. How did the efficiency movement and scientific management manifest itself in the area of psychology and mental testing specifically?

JD: Even though J. M. Rice is credited as being one of the founders of the American testing movement, devising the first set of spelling tests in 1893, E. L. Thorndike provided the psychological basis for mental testing that is still predominant in your day. Thorndike started his study of human learning by studying animal behavior with the publication of his article, "Animal Intelligence" (Thorndike, 1898). From observing the modification of animal behavior by providing food to the animal in a box, Thorndike theorized that all

learning, animal and human, was explained by the bonded connection of a stimulus and a response. Thorndike called this theory the "Law of Effect". That is, a satisfactory outcome of any response "stamps in" it's connection to a given situation and, conversely, an unsatisfactory outcome tends to "stamp out" the connection or bond. According to Thorndike, all of learning is the sum total of all these S-R connections in the brain. By extension, Thorndike explained all of human nature simply as a mass of these learned connections. He continued then to say that human nature can be exploited for good or bad, depending on what learning has taken place (Thorndike, 1913).

MH: That sounds like the beginning of behavioral psychology, elaborated by B. F. Skinner, but what does that learning theory have to do with social efficiency and testing?

JD: In my view, Thorndike's learning theory fits right into the social efficiency mind set because it is so reductionist. Thorndike's goal as a psychologist was to explain and clarify learning. "Psychology contributes to a better understanding of the aims of education by defining them, making them clearer" (Thorndike, 1914, p. 5). However, the compulsion to clarify the most discrete details of learning causes us to miss the whole aim of education. Just as Snedden and Prosser reduced vocational education to training for a job, Thorndike reduced human learning and even human behavior to brain synapses, or the "reflex arc" as he called it. In both cases, man is reduced to something to be manipulated for the sake of efficiency. In both cases, something very complex and significant is simplified for the sake of greater clarity and understanding. For the sake of scientific management and efficiency, we were left with a vocational education system that served to control students for industry's needs and that ultimately resulted in separating people into upper and lower social classes. For the sake of scientific management and efficiency, we were left with a scheme for measuring student achievement and human potential which sorted and selected students into educational programs and occupations that also resulted in separating them into their "probable destinies" as Charles Eliot originally stated it (Eliot, 1908).

MH: How did the early tests do that?

JD: Thorndike insinuated his S-R theory to education very naturally by connecting his concept of learning to the measurement of learning. He published a plethora of objective subject area tests that were designed to measure school achievement and learning according to the S-R theory. Learning, according to Thorndike, is the sum of discrete S-R connections. A test measures only a sample of these discrete connections. What resulted was a testing industry, which the public believed measured the totality of learning, with an instrument of limited items, each representing a discrete S-R connection. This had great appeal because learning could finally be explained in simple and measurable ways. What's more, the results of those tests could be used by efficiency minded educators and businessmen to quickly make decisions about student growth and potential in order to efficiently sort and select. Thorndike reasoned that "whatever exists at all, exits in some amount and can be measured" (Thorndike, 1918, p. 16). That strikes me as the ultimate in measurement excesses. Many say that God exists. I wish I would have asked Thorndike about that!

MH: How did you respond to Thorndike?

JD: I first responded in an article published in the Psychological Review called "The Reflex Arc Concept in Psychology" (Dewey, 1896, 1972). Basically I criticized his S-R theory for breaking down learning into simple fragments, when I believe that learning is a complex, unitary function. I attempted to illustrate that point philosophically by explaining that learning is not "breaking down" and identifying dualisms, and that it is even more than merely a synthesis of various dualisms. Rather, learning is habit formation from the continual reconstruction of existing dualisms into entirely new unitary functions and understandings.

MH: Sounds like a break from Hegel's philosophy.

JD: I think it may have been the beginning of my move away from Hegel's sense of dualisms and how they become synthesized. To illustrate this further, allow me to quote from my article:

> The greater demand for a unifying principle and controlling working hypothesis in psychology

> should come at just the time when all generalizations and classifications are most questioned. It is the very culmination of discrete facts creating the demand for unification that also breaks down previous lines of classification. The older dualism between sensation and idea is repeated in the current dualism of peripheral and central structures and functions; the older dualism of body and soul finds a distinct echo in the current dualism of stimulus and response. As a result, the reflex arc is not a comprehensive, or organic unity, but a patchwork of disjointed parts, a mechanical conjunction of unallied processes. What is wanted is that sensory stimulus, central connections and motor responses shall be viewed, not as separate and complete entities in themselves, but as divisions of labor, functioning factors, within the single concrete whole. (Dewey, 1896, 1972, p. 197)

As you can see, I felt that the S-R theory gave us one disjointed part of the learning process as if it were the whole. Further, I believe that the stimulus is something to be discovered by the individual, not to be presented by an experimenter or other controller. As soon as the stimulus is adequately understood by the learner, then and only then, is the response also complete. Moreover, it is the motor response which assists in discovering the stimulus. Successive and coordinated S-R circuits, building one upon the other, create growth and habits. Learning, then, is not an arc, but a never ending series of coordinated circuits in which life experiences are both stimulus and response.

MH: I'm beginning to see how that explains your vision of assessment and vocational education.

JD: Good.

MH: For full learning and growth, an individual needs the duality of both general and vocational experiences, since both serve as a stimulus and response for the other. For comprehensive and unified assessment, an individual needs feedback on the duality of both abstract understandings and manual applications. In both instances, the duality achieves a unity which has greater impact on the individual and on society than each of the dual parts taken separately.

JD: Good Job! I called that new unity "reconstruction". This reconstruction is important for all students because the interplay of the dual systems helps students reflect on their experiences, thus opening up new habits. As you can tell, I find dualisms or dialectics indefensible (Dewey, 1897, 1972). We will always grow individually, and as a democracy, when we achieve unity of vocational and general education, unity of assessment and instruction, unity of thought and action, unity of subject matter and the mental operations to deal with it, and unity of work, school and everyday life.

MH: How did the duality of assessment and instruction happen in education?

JD: It seems to me that it goes right back to efficiency and scientific management. Because educators were presented with new tests that efficiently sorted and selected students, and those new tests came with highly complicated statistical requirements for their use and interpretation, a great wall was built between teachers and measurement experts. Teachers were told to teach and not worry about measurement, and measurement experts were told to assess and not worry about teaching. Another dialectic emerged. We have been trying to put it back together ever since.

MH: Did any of your contemporaries try to put it back together?

JD: I like the approach of Frank Ballou, Director of the Department of Educational Investigation and Measurement at the Boston School System. Even though he supported standardized testing in schools, Ballou (1918) gave some practical guidelines for their use:

> Never give a standard test unless you have a definite purpose related to the improvement of instruction and unless you are prepared to tabulate, interpret, and use the results at once. Since the ultimate purpose of all educational measurements is the improvement of the instruction, it also becomes of paramount importance that the results be made known to the teachers and others

before their interest in the tests has waned (p. 45).

MH: You have used the word feedback throughout this interview to describe the role of student assessment. Is that how you see the role of assessment?

JD: Yes. I have no problem with assessment used as a means to clarify and even classify as long as its primary function is feedback, or as Thorndike would have it, a stimulus for another response. In other words, assessment is integral to learning because it is part of the S-R circuit. As I said in the Psychological Review, "Values do not cease to be values because they are minutely and accurately measured" (Dewey, 1900, p. 115). What use one makes of those measurements is what's important.

MH: Today, we distinguish between high and low stakes testing. "High stakes testing" involves the use of tests for significant decisions about a student's future; such as graduation from high school, grade promotion, selection into college, and the like.

JD: Unfortunately, you haven't come as far as I had hoped. In the early 1900's, we used the newly developed standardized tests to feed our appetite for efficiency. Like your high stakes tests, they were used to determine who was best fitted for vocational training and general education, who should be hired into various levels of work in business and industry, and even who should fight our wars on the front line and who should be selected as officers. These are hardly uses from which an individual can learn. Since these mental tests, when used for efficiency, treat individuals as members of a social class, they cover up individual traits. Remember, the proper role of assessment is feedback so new and broader learning can take place. "Democracy will not be democracy until education makes it its chief concern to release distinctive aptitudes in art, thought and companionship" (Dewey, 1922b, p. 63). Testing, then, is undemocratic if it retards the creation of new education.

MH: Didn't the creation of vocational guidance stimulate a more proper use of tests as a learning tool?

JD: Somewhat, but I'm afraid the aptitude and interest tests available to guidance counselors were too easy to use as a replacement for sound guidance. The instruments, all too often, made decisions for teachers and counselors on the basis of numbers generated from group norms.

MH: That's true today as well.

JD: The problem again is expediency. We have been so seduced by the easy interpretation of numbers that we fail to understand how the numbers simply clarify certain discrete behaviors or responses relative to a norm group. The total picture of the individual is missing. When interpreting test results, instead of a teacher or counselor telling the student what he or she can or cannot do, the student should tell the teacher or counselor what he or she should or should not do and why. This is how reflective thinking occurs. I feel that the practical value of any test lies in the stimulus it gives to more intensive inquiry into individualized abilities and disabilities. As Bagley (1914) put it, "The only function of tests is to tell the educator where he began; it is the educator's vision -- and society's -- that ultimately set the goals" (p. 165). This reflection on the results of tests helps a student grow, form habits and make decisions. This is how education creates a democratic society.

MH: Today many call that "student-centered" assessment.

JD: Really! Maybe you're not as bad off as I thought!

MH: Perhaps current technology is catching up to your philosophy. Current psychologists and mathematicians have been working on a new testing technology called Item Response Theory (IRT), which is being used in something called Computerized Adaptive Testing (CAT). In CAT, a student takes an exam at a computer. A student response to a particular item determines which item the student will answer next. No two students take the same test. By use of a computer, the test is, in effect, "normed" on the basis of how the individual student responds on the instrument rather than how a norm group responded to the instrument.

JD: If I understand you correctly, IRT will eliminate any possibility of using the test results for comparisons to others. Let me quote from Democracy And Education to tell you how I feel about norm referencing.

> How one person's abilities compare in quantity with those of another is none of the teacher's business. What is required is that every individual shall have opportunities to employ his own powers in activities that have meaning. Imposing an alleged uniform general method upon everybody breeds mediocrity in all but the very exceptional. And measuring originality by deviation from the mass breeds eccentricity in them. (Dewey, 1916, p. 203)

MH: But what if normed test results are given to students as feedback only?

JD: As I mentioned before, the danger in testing is in decisions that create social stratification. Take life insurance for example. Without extensive statistical data that establish quantitative norms on accident occurrences, it would be impossible to set insurance premiums. Individuals are graded as to their degree of insurable risk on the basis of these norms, but the results of the norming do not determine the fate of any one person (Dewey, 1922, 1929). When normed tests of achievement or intelligence are used to determine the fate of a student, the effect is social stratification. When normed tests are used as feedback, and the student is allowed to reflect on the meaning of those results and set goals accordingly, the effect is growth and learning. Does the absence of group norms in IRT mean that test results can't be used for social stratification?

MH: It would seem so, yes. Not only that, unique items presented to a student will stimulate higher order learning and habits because they are calibrated to the ability level and interests of the individual, not a group. We have the potential of assessing not just what was taught, but also using assessment as an individualized learning tool.

JD: This sounds great! Maybe I'm not such a unrealistic dreamer as my critics charged. What's the catch?

MH: I think there are significant problems yet with our measures of ability or aptitude and interest. Since these constructs form the basis of individualized item calibration, we must be certain that our measures are valid indicators of the construct .

JD: I'm encouraged by any breakthroughs that use assessments of students to free up new learning for the individual and erode the status quo of social stratification.

MH: At the same time, we still have a huge testing industry out there that facilitates the efficiency of high stakes testing, which is based on the notion of predictive validity of the tests. As the name implies, tests have predictive validity when it can be demonstrated that high scores on the tests correlate to success in some other experience, such as a job. This is still a very pervasive use of test results that does seem to perpetuate the status quo.

JD: I'm familiar with predictive validity. Thorndike actually wrote a book about it called Prediction of Vocational Success (Thorndike, 1933). It was a huge statistical study commissioned by the Commonwealth Fund in 1922 to investigate the possibilities of vocational guidance at about the age of fourteen on the basis of psychological tests. Efficiency was written all over it. According to the study:

> If guidance as is now given at age fourteen were shown to be less trustworthy than an individual's own ideas and impulses, there would be a saving of much time and money by delaying it. If the guidance now given is beneficial, but can be made twice as beneficial by methods which are no more costly, there will be a great gain in efficiency by changing to better methods. Employers certainly can profit greatly by using tests of intelligence, clerical capacity, and mechanical adroitness in the selection of employees. Test scores will be much better than prejudices and superstitions. (Thorndike, 1933, p. 159)

MH: I take it that you don't think highly of predictive validity.

JD: I don't think highly of any test that requires predictive validity for it's application. The best test for predicting success on a job is experience on the job. That is the role of a fully integrated unified vocational and general education. Students can then better self select on the basis of that experience, and they can reflect on tests that clarify performance but don't rigidly try to determine intelligence, interest and achievement. I think that the more appropriate guidance tool would be a test that documents validity for its effect on student learning and self understanding as related to potential success in a career, college or whatever.

MH: I'm amazed that you said that! We actually have a name for that kind of test validity and its just coming out in the literature. Its called "consequential validity". The theory behind this, is that tests are valid to the extent that they provide positive consequences for students (Baker, Dunbar, & Linn, 1991).

JD: Fantastic! You are coming along well today!

MH: I'm beginning to see how consequential validity relates to your concept of waste. Tests that have positive consequences for students would, by definition, be connected to broader issues of life. As we discussed earlier, these would be authentic assessments. Such assessments, because they are unified with various life issues and problems are efficient. The tests created by Thorndike and others in your day are inefficient and wasteful because they measure trivial knowledge of discrete facts and information bound by the classroom and textbook.

JD: I couldn't have said it better myself.

MH: I'd like to end on a positive note, so let me try to summarize what you are suggesting to us about assessment. Assessments are valuable when they are "low stakes," that is, when students and teachers use them to clarify achievement, interest, and aptitude for the purpose of stimulating new learning. Assessments are valuable when they are authentic to life experiences as much as possible, thus encouraging the integration of vocational and general education. Assessments are valuable when they promote positive consequences for students, thus helping them form new and more meaningful habits. Assessments are valuable when they do not separate students into performance categories, but rather help students better understand their own growth. Assessments are valuable when they match instructional aims, which, in turn, match societal aims for education. In short, assessments are valuable when they expand opportunities for students rather than limit opportunities.

JD: Bravo! I think you've got it! I wish this wasn't coming to an end. I haven't said a word in forty four years and now this! I'm comforted to know how assessments are beginning to serve the real aims of education, but concerned about how long it has taken. I think I was born too soon.

MH: On the contrary, I think our progress in assessment, and in education generally, is made possible today by your prophetic voice so many years ago. We thank you.

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