# The Game
## Racing Against Time

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> What, then, is time? If no one asks me, I know what it is. If I wish to explain it to him who asks me, I do not know.
>
> —St. Augustine, 1964, p. 58

IN HIS *CONFESSIONS*, written in the fourth century A.D., St. Augustine (1964) asks the famous and very difficult question of "What is time?" Augustine says if he is asked how he knows that time does exist, he would answer, "I know because we measure. We could not measure things that do not exist…" (p. 63). But that does not mean Augustine has found an answer to his question of time, for he exclaims, "O my God, and how is it that I do not know what I measure?" and questions whether what he measures is only intervals of time, not time itself (p. 67). Here Augustine seems to suggest a distinction between the measurement of time and time itself. This distinction reminds me of one special exhibition I saw in my visit to the Metropolitan Museum in New York in April of 2008: "The Art of Time: European Clocks and Watches from the Collection." It is so often that people equate the measuring *technology* of time with the *art* of time.

People's enthusiasm for measuring time more and more accurately leads to more and more advanced time measuring instruments. Alfred W. Crosby (1997) believes that the desire to quantify time is especially unique to Western society. After the European archetype of modern mechanical clocks was built in the 1270s, unequal hours "bounded by natural events" were gradually displaced by equal hours arbitrarily defined by humans (Crosby, p.76). For people living in cities with bells in the Middle Ages and Renaissance, Crosby writes "a city without bells" was like "a blind man without a stick" (p. 76). Time measuring instruments—bells, clocks and watches—seem not only to completely replace time itself but to become a necessary part of our lives. We begin to rely more and more on external time and try to always keep pace with the constantly running hands of time on mechanical clocks and watches.

An inscription on a clock installed in the city of Caen in 1314 reads: "I give the hours voice/To make the common folk rejoice" (Crosby, 1997, p. 76). What kind of voice does the

clock give to the hours to make people rejoice in this inscription? Is it a voice celebrating humans' victory in conquering and thus imprisoning invisible time between the ticking hands of clocks and watches? Time is therefore embodied and tamed: dissected and fixed on the anatomy table of clocks and watches, cut into smaller and smaller quanta from days to hours, hours to minutes, minutes to seconds, and seconds to split-seconds. So, too, is school time imprisoned in the echoes of school bells.

In the continuous taming of time amongst the echoes and reverberations of the proliferation of clocks and watches, Frederick Winslow Taylor's "time study" stands out as a major event in the history of the control of time with lasting implications for education. Known as the father of scientific time management, Taylor and his early 20th-century study live on as "time on task" in today's schools.

This paper will first examine Taylor's theory of scientific management, especially his time and motion study, as it relates to the "cult of efficiency" in education and then analyze the hidden dangers behind the conceptualization and daily practice of "time on task" in schools. Finally, the paper explores the struggle against these dangers or the ghost of control in the fettered time on mechanical clocks and watches, and calls for a careful listening and responding to the living rhythms of time.

## The Stopwatch of Taylor

> Although scientific management employed many identifiable and characteristic mechanisms, its most prominent tool was a stopwatch, the popular symbol of the scientific management movement. The stopwatch symbolized the new approach to management: "*management based on measurement"* [italics added].
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> —Milton Nadworny, quoted in Callahan, 1962, p. 28

The title of Robert Kanigel's book, *The One Best Way* (1997), points to the essence of scientific management, called *Taylorism*, after its inventor Frederick Taylor. *Taylorism* is seen as the best way to achieve maximum efficiency in the minimum amount of time. According to Nadworny, quantification is the heart of the scientific movement— "management based on measurement" (p. 28). Since Taylor developed his theory of scientific management in the 1880s, the idea of efficiency swept through almost all aspects of American society and spread to other western countries around the early 20th century. Taylor successfully "made efficiency the *modus operandi* of American industry and cardinal virtue of American culture" (Jeremy Rifkin, quoted in Kanigel, 1997, p. 8). As people tried to apply Taylorism to all activities for the purpose of achieving greater efficiency, meaning the minimum input for maximum output, education and schools were no exceptions. In Raymond Callahan's (1962) exploration of the historical origins of the "the cult of efficiency" in education, he reports that between 1900 and 1925 educators were under mounting criticisms by both outsiders and insiders for their lack of businesslike efficiency in terms of the material waste of time, energy, and money in schools. Consequently, Taylorism began to permeate teaching and learning practices in schools.

"Time on task" remains one of the most significant effects of Taylorism in schools today. Taylor argues that for good management in schools it is necessary to set daily definite tasks for all people:

> There is no question that the average individual accomplishes the most when he either

> gives himself, or some one else assigns him, a definite task, namely a given amount of work which he must do within a given time; and the more elementary the mind and character of the individual the more necessary does it become that each task shall extend over a short period of time only. No school teacher would think of telling children in a general way to study a certain book or subject. It is practically universal to assign each day a definite lesson beginning on one specific page and line and ending on another; and the best progress is made when the conditions are such that a definite study hour or period can be assigned in which the lesson must be learned. Most of us remain, through a great part of our lives, in this respect, grown-up children, and do our best only under pressure of a task of comparatively short duration. (quoted in Callahan, 1962, p. 30)

Here Taylor assumes that in terms of human nature most people work well only under the pressure to complete a task in a given time. Applying this to education, the best progress in school would only be achieved when "a definite study hour or period can be assigned in which the lesson must be learned" (quoted in Callahan, 1962, p. 30). This assumption of human nature can be seen as where the conceptualization of "time on task" comes from theoretically. Educational efficiency in some sense becomes about "beating" time. In other words, time becomes a quantifiable index measuring the extent of educational efficiency.

If Taylor were alive today, I think he would be much more than happy to see his conception of the management of teaching and learning based upon "time on task" being so well implemented in schools. Most teaching materials, including textbooks and teachers' syllabi/lesson plans, are divided into smaller and smaller units of basic tasks: unit after unit, lesson after lesson, topic after topic, according to the timetable of class after class, day after day, week after week, semester after semester, and year after year. Teachers are constantly declaring loudly in class, "The deadline of this assignment is …." "The due date of the paper is …" "Attention! Only two minutes more for the test!" "In the remaining class we will finish the next chapter." "Let's move quickly to finish this book this week." How familiar these phrases sound to us from our past and present experiences of schooling! Now "time on task" is such a routine practice in educational systems that it is rarely labeled as Taylorism; it is simply taken-for-granted as part of everyday school life.

However, Maxine Greene (1988) questions the taken-for-granted as she suggests we deconstruct what seems familiar and natural in our daily life for different perspectives of vision. Can we therefore defamiliarize the seemingly normal phenomenon—"the clocks that play such important parts in schoolrooms, or school bells, or loudspeakers blaring the beginning and end of the day"—and question "why *should* these phenomena be presupposed as a 'basis' for thought and self-identification?" (Greene, 1988, p. 153, original emphasis) Following Greene's suggestion, I begin with a critical analysis of Taylor's famous time-and-motion study to question the rationale of "time on task" in schools.

## Time and Motion Study

Callahan (1962) points out that Taylor lists the time and motion study as the preliminary step of scientific management: at first divide every job into small tasks, then observe all of the tasks with a stopwatch and recording card, finally decide unit times for each part, and rearrange all parts in a more efficient order. Obviously Taylor's time and motion study touches upon two key

elements in his conception of "time on task": first, the breakdown and rearrangement of basics in work analysis; and second, the assignment of unit times for each basic unit of work. We might think of Taylor's "time on task" as analogous to fixing time into a straight string, and carefully selecting only basic and important jewels from a messy collection of trinkets, charms, gems, and beads, lining up one after another on the string, big beads occupying longer lengths of string, and small ones shorter lengths. For Taylor, beauty comes from what is tidy and neat. The real world, however, in all its fuzziness, can hardly be arranged to fit together like jewels on a string. Kanigel (1997) describes the difficulty Taylor encounters in tracking down each elementary movement, each basic part or jewel, in the work analysis of time study:

> Amid the blur of activity of human work, where did one element end and another begin? And how did you classify these elements once you had them? Taylor "threw away his first two years of time study" results, he wrote later, because they were so poorly indexed he couldn't find what he needed when he looked for them. (p. 206)

What confuses Taylor, to continue with my analogy, is that the beads are not, as he imagines, individual monads with definite beginnings or endings on a straight string; rather, the string often bends with mixed boundaries between its beads. In other words, not all tasks of a particular job can be clearly separated from each other. It becomes a challenge for Taylor to entirely distinguish one bead from another. Another difficulty Taylor encounters is the question of how "purely mental" work could be timed. It is easy to measure how long it would take one to move a pile of books from one place to another, but how to measure the time needed for a writer to finish his or her masterpiece, for an artist to capture an inspiration, for an actor to get the soul of the drama he or she will play? One second? One hour? One month? One year? Or several decades? When the sizes of some beads are ill-defined on Taylor's linear string, how then does one decide to break the whole into clear-cut parts, the length each of them should occupy on the string? This problem of where to draw the line between tasks of a particular job leaves Taylor stuck: some tasks of our work cannot be measured. As Kanigel points out, in critiquing Taylor's time study, the success of chemists often, if not always, depends "not at all [on] precision measurement and rests almost entirely on his guess" (p. 512), when he weighs a substance on a balance to five decimals and the same also applies to the time study—the precision of Taylor's stopwatches cannot guarantee the final success of our work.

The two difficulties confronted by Taylor, deciding the basic units of a job and the timing of mental work, are direct challenges to his conception of "time on task"—the assignment of a definite task which workman must accomplish in a given time. Time-on-task requires not only that work be divided into individual monads (of beads) but that each task (bead) should occupy a definite length on the linear string of time. When it turns out, however, that tasks cannot be clearly divided, how can Taylorists justify "time on task" in theory and practice? And yet, Taylorism persists in schooling, as for example, in the use of textbooks with education/knowledge broken into chapters, separate lessons, or units and divided by disciplines. How can these units be lined up linearly one after another with a particular beginning and ending time for ALL teachers and students? Are not all units, chapters, and disciplines actually intimately connected with each other without clear boundaries? Do not each teacher and each student with different past experiences teach and learn at different paces?

## Knotted Time

I have used the metaphor of beads and string several times in this paper. This metaphor reminds me of my play with Chinese knots in childhood, a traditional decorative handicraft art in China with a long history of over a thousand years. In this folk art, the strings and beads can be woven into various knots through different methods. Intertwining beads and strings in different combinations for unique knots was one of my favorite activities in my childhood. Michel Serres (1997) has a beautiful account of such knots:

> The term *complex*, coming from fold or knot, designates and even describes a situation that is a bit more constrained than multiplication. Dedicated only to the number, the latter cares nothing for place, whereas the term complex takes it into account. Complex designates a group of folds when it passes from arithmetic, pure counting, to topology, which has a penchant for crumpled bits of cloth. (p. 20, original italics)

When the strings cross one another in the knot, they are not just added or multiplied numerically, but produce new patterns or networks of relationships which cannot simply be calculated mathematically. As suggested by Serres, the art of knotting is the science of topology, a three not two dimensional study extending beyond the vision of Taylor. Taylor is apparently an industrious but boring designer, for he focuses only on his ONE best way of selecting and connecting beads on the single string in one linear order. Taylorist-influenced teachers tell their students, "You must learn this first during this period of time and then learn that in that period of time. If you skip any step in the long procedure, or cannot finish in due time, you are going to fail." Is it true, I wonder? Is it necessary for us all to string all beads one by one, at the same time? Can we make leaps among the beads? Can we break the string to reorder the beads in different ways? Can we fold or twist the strings to connect the beads for different knots? Can we have more than one string to connect beads together as another way of design?

Serres's metaphor of time as kneaded dough in *Rome: The Book of Foundations* (1991) offers valuable insights to these questions. Serres compares the passage of time in history to the actions of a baker, stretching and folding over the dough, over and over again. He claims the baker never leaves any mark in continually stretching and folding the dough, but the action is inscribed in the dough as clearly as writing with a stylus:

> We could attempt to read its trajectory or the trace it has left. But it is illegible. It is not a letter or a phrase, not a zigzag, not a secret scrawl, not a trajectory; it is the flight of a fly or a crazy wasp. Each leap is clear and determined, yet the whole path seems problematic. (p. 82)

Here Serres argues that the travel of time is not even a curve or a zigzag but radically "the flight of a fly or a crazy wasp" (p. 82). The baker does not follow any so-called law in folding the

dough (of time or history).

Compared with Serres's contempt of laws, Taylor has a very firm faith in the "code of laws" (Kanigel, 1997, p. 511). Defending his time study in 1914, Taylor asserted before the U.S. Industrial Relations Commission, "There is nothing in the world more powerful than a code of laws" (Taylor, quoted in Kanigel, 1997, p. 511). While Serres, like the baker, jumps, leaps, and even flies like "a fly or a crazy wasp" with historical time, Taylor follows a code of laws like an efficient technician, walking carefully and precisely, step by step along the straight-forward string of time. From my perspective, we need not be tied to a particular concept of time; the leap or crazy flight made by the baker is at least as meaningful, perhaps more meaningful, than the plodding linearity of a string of time. Shifting metaphors, rather than rushing to finish each particular task on time, we need to look for the potentially related string(s) of possibility, in the constant deconstruction and reconstruction through (re)arrangement of beads and folding of strings. In some sense, the knots or folds are more important than the strings or beads themselves, because it is those knots that cross the strings and hold the beads together and grant meanings to them. Despite the difficulties encountered by Taylor in his time study, which deeply shake the essential foundation of his conception of "time on task," Taylor's ghost still lives in our schools, pushing teachers and students to finish all assigned tasks, lined up one by one, in due time.

In the rest of the paper, in further analysis of Taylor's time study and conception of "time on task," I focus on the ubiquitous presence of clocks and watches and on the shackling of time in modern society.

## Fettered Time in Clocks and Watches

> I saw the best minds of *my* generation preset and programmed by bells and buzzers and buzzwords…
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> —Noel Gough, 2002, p. 3

> The will to mastery becomes all the more urgent the more technology threatens to slip from human control.
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> —Martin Heidegger, 1993/1999, p. 313

In *Curriculum Visions* (2002), both editors, William Doll and Noel Gough, choose the metaphor of the clock to represent the external control embedded in the curriculum. Doll (2002) explains, "control is not only the mechanical ghost in the curriculum clock—to use a modern, mechanistic metaphor—but is also the force which actually runs the clock as its pendulum swings from one ideology or fad to another" (p. 34). This ghost of control hovers over schools in the loud clicking sound of clocks. The immense pressure of control by mechanical clocks, which Gough critically analyzes and Doll tracks back to Taylor's scientific management principles, can be explained in some sense by German philosopher Martin Heidegger's critique of modern technology as human's overwhelming desire for control. Heidegger was primarily concerned with the question of being, investigated through phenomenology and described as "*the work of laying open and letting be seen*" through clearings as ruptures or breaches for new insights (1985, p. 86, original emphasis).

In the December of 1949, Heidegger gave four lectures to the Bremen Club under "Insight

into What Is," one of which was "The *Enframing*," later revised and published as "The Question Concerning Technology" (1993/1999). In this lecture, he states that in the modern technological society, "everywhere everything is ordered to stand by, to be immediately on hand, indeed to stand there just so that it may be on call for a further ordering….We call it the standing-reserve [*Bestand*]" (1993/1999, p. 322). Compared with the old windmill which completely relies on the blowing wind, Heidegger argues that modern technology "puts to nature the unreasonable demand that it supply energy which can be extracted and stored as such" (1993/1999, p. 320) for "the maximum yield at the minimum expense" (p. 321). How this phrase might resonate with Taylorists who are always seeking efficiency! Taylor's stopwatch, so much a part of his time and motion study, famously symbolizing scientific management, chains time so that it can be "ordered to stand by, to be immediately on hand, indeed to stand there just so that it may be on call for a further ordering" (Heidegger, 1993/1999, p. 322). The ghost of control makes humans spare no means to put everything under their claims, and time is no exception. The presidential address of Theodore Mitchell to the Schoolmasters Association of New York and Vicinity in 1992 is one of the attempts of this ghost of control trying to conquer schools. Mitchell encouraged educators to "speed up" like their efficient colleagues in business and industry, noting critically that "we [teachers] are curiously protected in inefficiency" (quoted in Crosby, 1997, p. 102).

As Taylorists try to harness time as standing reserves, do they really make quick work? Heidegger's answer would probably be "no." Heidegger (1971) writes that man can "put the greatest distances behind himself and thus puts everything before himself at the shortest range" by advanced modern technology, but "the frantic abolition of all distances brings no nearness; for nearness does not consist in shortness of distance" (p. 165). In this sense, real efficiency is not in the fastest speed and shortest watch time. The shortest watch time does not necessarily mean good quality work, and so called efficiency of "time on task" in schools does not equal good education.

This sentiment is echoed by Jean-Jacques Rousseau in his masterpiece on education, *Emile*, written in 1762: "May I set forth at this point the most important and the most useful rule in all education. It is not to save time but to waste it" (1962, p. 77). What an interesting counter-claim concerning education and time: At the beginning of 20th century, educators were pressured to apply Taylor's scientific management theories, especially his conception of "time on task," into school, but Rousseau is here advising that the secret of good education is not to save but WASTE time in the mid-18th century! What a sharp contrast to schools in the 21th century with their heavy emphasis on the "efficient" use of (clock) time! Should teachers and students be allowed to enjoy the luxury of wandering from "task on time" and, thus, take time at their own pace enjoying education? How can this precious and necessary "inefficiency" of our teaching and learning be carefully protected in school?

When man is so complacent that everything including time is under his control by advanced modern technology, he ignores the hidden great danger that he is actually controlled by his own will to mastery and the technology. In other words, when man tries to control time and thinks he has successfully tamed time, he is actually controlled by time or specifically the watch time invented by himself. Heidegger's critique of modern technology offers one compelling reason why inefficiency should be protected as he critically analyzes such danger behind man's overwhelming will to control:

> [Man] comes to the point where he himself will have to be taken as standing-reserve.

> Meanwhile, man precisely as the one so threatened, exalts himself and postures as lord of the earth. In this way the illusion comes to prevail that everything man encounters exists only insofar as it is his construct…. Man….fails to see himself as the one spoken to, and hence also fails in every way to hear in what respect he *ek-sists*, in terms of his essence, in a realm where he is addressed, so that he can never encounter only himself. (1993/1999, p. 332)

It is this human's forgetting of his own essence as being addressed to and claimed by that constitutes the essence of modern technology, which intends to put everything under absolute control. For Heidegger, the essence of technology is not the technological itself but the way that technology dominates in our present society. When man assumes himself to be a solo singer and cannot hear the call from the earth, his will to will, master, and control thus reigns. He thinks he is now the lord of world and earth by the tool of technology, but he is actually willed, mastered, and controlled by technology.

Richard Bernstein (1992) mentions that in Heidegger's unpublished manuscript of this lecture on technology, a passage deleted from the published version: "Agriculture is now motorized food industry—in essence the same as the manufacturing of corpses in gas chambers and extermination camps, the same as blockading and starving of nations, the same as the manufacture of hydrogen bombs" (p. 220). What a shocking finding! This example might best serve as the essence of modern technology—man finally falls as merely standing-reserve in the technological society. Similarly, people try to control time with clocks and watches, not realizing that they are actually the ones being controlled by this technology. It is humans who invented clocks and watches but now are regulated by a clocked life. What controls people is, indeed, their very will to control time!

In Taylor's time study, the fastest speed on the stopwatch means everything. In order to produce the greatest efficiency from workmen through his scientific management, Taylor not only invents a system to encourage workers to work harder for financial bonuses, but makes clear distinction between work responsibilities. The specialists are in charge of work analysis and planning, the managers are responsible for supervision and management, and the workers are instructed on what and how to do work. Taylor declares, "In the past the man was first," but "in the future the system will be first" (quoted in Kanigel, 1997, p. 513). As the system replaces man to become first in Taylor's scientific management, man completely falls as the "standing reserve" in the modern society (Heidegger, 1993/1999, p. 332). One critic in Kanigel points out that Taylor's time study "practically eliminates the operator's or mechanic's personality, transforming him from a skilled mechanic into that of *factotum* or machines, and the foreman in charge only one grade higher but in the same class" (p. 445). This deprivation of the humane aspect in Taylorism is also demonstrated in our schools as Greene (1995) writes,

> The vision that sees things small looks at schooling through the lenses of a system—a vantage point of power or existing ideologies—taking a primarily technical point of view…. Whatever the precise vantage point, seeing schooling small is preoccupied with test scores, "time on task," management procedures, ethnic and racial percentages, and accountability measures, while it screens out the faces and gestures of individuals, of actual living persons. (p. 11)

In this sense, both teachers and students are reduced to mechanical pieces and parts of the whole

system, like numerous tiny screws on a big machine. This huge machine can finish any assigned tasks on time as efficiently as possible without any questioning of the legitimacy of the task itself or the due time—a perfect example of teachers and students as "standing reserve" in the giant ticking sound of Taylor's stopwatch.

## Struggling

Then, how can we deal with the ghost of control or mastery in the giant ticking sound of clocks and watches? Heidegger (1972) thinks it necessary for us to first make clear distinction between time and clocks or watches,

> Time familiar to us as the succession in the sequence of nows is what we mean when measuring and calculating time. It seems that we have calculated time immediately and palpably before us when we pick up a watch or chronometer, look at the hands, and say: "Now it is eight-fifty (o'clock)." We say "now" and mean time. But time cannot be found anywhere in the watch that indicated time, neither on the dial nor in the mechanism, nor can it be found in modern technological chronometers. The assertion forces itself upon us: the more technological—the more exact and informative the chronometer, the less occasion to give thought first of all to time's peculiar character. (p. 11)

It seems that the more tightly time is fixed on the chronometer no matter how advanced it is, the faster time is dying in the clock world. Greene (1988) expresses the same concern when she quotes Quentin's memories of his father's comments on clocks and time in William Faulkner's *The Sound and the Fury* (1946), "Father said clocks slay time. He said time is dead as long as it is being clicked off by little wheels; only when the clock stops does time come to life" (quoted in Greene, 1988, p. 154). Does this mean time will be revived only when we destroy all clocks and watches? If not, where is the "saving power" (to borrow Heidegger's phrase, 1993/1999, p. 341 to grant time life in the supreme danger of controlling and being controlled in the clock world?) Klaus Mainzer (2002) suggests, we need to "spend less time watching the clock, and should take note of inner temporal rhythms of nature and society" (p. ix). In fact, the danger of the death of time does not lie in the running hands of clocks and watches but in humans' desire for control, the will to mastery which is hidden behind those time-measuring instruments and time experiments for efficiency in the constantly accelerating society, including Taylor's time and motion study and conception of "time on task." What we lack is a careful listening and responding to the living calls of the inner rhythms of time, as Mainzer cautions us.

When we enjoy the convenience clocks and watches bring to us in their accuracy of measuring time, can we allow ourselves to be addressed to time, to listen to a dance of time in our complex world that is not restricted by the hands extending from our clocks and watches? If we refuse to slow down to turn our ear and heart to that inner rhythm of time, the addiction to ever-increasing speed in our racing against time, cheered by the ghost of Taylor on his stopwatch, will be nothing but "the unleashing of violence" (Virilio, 2005, p. 45), for such a racing game will finally turn into a countdown in which only the departure and arrival remain and the process itself is lost. While the process is destroyed by the end, it is more and more difficult for us to remember purpose. The more we concentrate on reaching the destination as quickly as possible, the less we consider the possibility that we may indeed be running in a

wrong direction. While we become more and more efficient in accomplishing given tasks on time, one after another, we gradually forget to ask who assigns those tasks, who decides the due time, and why we need to finish tasks on time. As we run faster and faster in the race against time, this is a game we are destined to lose, for time can never be really or completely confined by clocks and watches, but we can be fettered by those never-tired, ticking machines invented by ourselves.

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