THE UNFINISHED INHERITANCE

A Call for the Renewal of Education

Dr. Mark Naufel

November 2026

First Edition

Preamble

No civilization is transmitted through the blood. Each generation is born as ignorant as the first, and must be taught within twenty years what mankind required ten thousand to discover. Every people that has endured has done so through the school, the workshop, and the patient conversations of the old with the young. Education is therefore no mere department of a civilization. It is the means by which a civilization continues to exist.

It follows that every generation must answer certain questions, whether it knows it or not. Who is to be taught: the few who can pay, or all who can learn? What are they to become: hands for the work of the day, or whole persons, able to judge, to make, and to govern themselves? Is a school simply to hand down knowledge, or to advance it through discovery and put it to practical use? And what is to be done with the machine that now reads, writes, and reasons after a fashion? It can think in our children's place, or it can rouse them to think, to question, and to reason more deeply than any generation before. The machine will not make the choice for us.

Every age receives these questions from those who came before it, and leaves its answers in the institutions it builds. Our generation has been given greater means than any other, and has so far employed them poorly. The inheritance of civilization will never be complete. May we be worthy of the ancient Athenian oath, and pass it to those who follow greater, better, and more beautiful than it was entrusted to us.

I

The Gate and the Flood

For most of history the best education was a privilege guarded by a gate. Plato's Academy was open to those who had the leisure to attend it. The mandarinate of China, for all its examinations, drew chiefly from families that could spare a boy from the fields for twenty years. Oxford for nearly three centuries admitted no one who would not subscribe to the established church. The quality was real, yet so was the waste, for genius is scattered among mankind without regard to rank, and every locked gate left a Newton at the plow.

The modern age resolved, to its lasting honor, to open the gate, and the schooling of whole peoples stands among the great achievements of civilization: two centuries ago perhaps one adult in ten could read, and today nearly nine in ten can. But multitudes taught by a single method at a single pace cannot each be attended to, and where the method failed a student the easiest remedy was to ask less. A credential that asks little certifies little.

Two further injuries followed. In many countries the price of the diploma rose even as its worth declined, until the young were asked to mortgage their first working decades for a certificate of attendance. And the institution, grown large, came to be arranged for its own convenience: its calendar, its departments, and its procedures serve the comfort of those who administer them far more than the progress of those who learn.

We must refuse the choice between these two failures. Exclusion wastes the many; dilution cheats them. Students may differ in preparation and in pace, but all must reach one high standard. Vittorino da Feltre held to that principle six centuries ago at Mantua, where in 1423 he opened a school

he called *La Giocosa*, the Joyful House, and taught the children of the poor beside the heirs of the Gonzaga, holding both to the same exacting standard. What one schoolmaster did in a single house, our age may at last have the means to attempt for millions.

II
The Counterfeit

The deepest fault of the modern school is older than any machine. It has made the student a spectator. The lecture began as the reading aloud of a scarce book, with the master's commentary upon it, and in the hands of a great teacher it can still be a work of art. As the common method of instruction, however, it has outlived by five centuries the scarcity that justified it, and too often the learner still sits where the medieval student sat, copying down what could be read at leisure.

The screen promised deliverance from this and delivered its perfection. It gave us the lecture on video, the quiz of four choices, and the progress bar: an education reduced to the pressing of buttons, in which the student's chief exertion is to remain awake. Seneca complained that the Romans of his day learned for the classroom and not for life. He had not imagined a school that taught for the click.

The thinking machine is so far only the latest symptom. Students ask it to write their essays; institutions ask it to grade them; and the two machines exchange courtesies while the mind they were meant to serve stands idle between them. Nothing has been learned, and a degree is conferred upon the transaction.

Socrates foresaw the pattern. In the *Phaedrus* he tells of the Egyptian king Thamus, who was offered the invention of writing and feared it would give people the appearance of wisdom without the substance. Writing was in time acquitted of the charge, because we learned to think with it and did not let it think in our place. That is the whole distinction, and upon it everything now turns. Every tool of the intellect may serve as a crutch or as a whetstone. The same instrument that can excuse a mind from effort can be made to demand more of it than any lecture hall ever has.

III
The Oldest Dream

The most admired education ever devised is also the oldest and the simplest: a good teacher attending closely to one student, or to a few. Philip of Macedon believed in it enough to engage Aristotle for the thirteen-year-old Alexander and a handful of his companions. Confucius practiced it, giving opposite counsel to two disciples who asked the same question, because one was rash and the other timid. Quintilian held it the mark of a good teacher to know the bent of each pupil, and Oxford preserved the practice in the tutorial.

In 1984 the psychologist Benjamin Bloom gave the old belief a number. Drawing on the work of two of his doctoral students, he reported that pupils taught one to one, and held to mastery before advancing, outperformed some ninety-eight in a hundred of those taught in an ordinary class. Later and larger studies have trimmed the figure and confirmed the fact: the pupil with a tutor learns markedly more.

The difficulty was never ignorance of the remedy. It was the cost. There have never been enough Aristotles, and no treasury could hire one for every child. So the nineteenth century, needing literate citizens by the million, borrowed from Prussia the graded classroom: thirty children of one age, moving through one book at one pace toward one examination. It was an honest bargain and a great achievement. It was also a compromise with scarcity, and it has always failed the quick, whom it bores, and the slow, whom it abandons, while serving tolerably an average student who does not exist.

That scarcity may be ending. Machines that converse will explain a thing the fortieth time as willingly as the first, and in time they may learn to tell what a student has mastered from what has only been memorized, and to meet confusion at its source. They do not yet do these things reliably: they err with confidence, they are inclined to flatter, and their effect upon learning has only begun to be measured. Whatever is built upon them must be tried as a new medicine is tried, and kept under the eye of teachers.

This is the proper office of the machine in education. It should never do the student's thinking. It should do what Socrates did for the slave boy in the *Meno*, who was led to a theorem of geometry by questions alone: to interrogate, to withhold the answer, and to make the labor of understanding unavoidable.

The promise is also a matter of arithmetic. Much of a teacher's day has always gone to labor that asks little of a teacher: repeating the explanation, setting the exercise, correcting the routine error. If a machine can carry a good part of that burden, the hours it frees may be spent where human presence matters most: in conversation, in mentorship, and in the exercise of judgment for which a teacher must answer. That is how a richer human education may reach many more people at a cost they can bear. It must be designed, for a school that merely keeps the saving has automated the counterfeit, and numbers must never be bought at the expense of learning.

IV
The Mind Worth Making

What, then, should such an education produce? It is a poor ambition to train people only for the tasks machines cannot yet perform, for that frontier retreats every year, and those who camp upon it will be forever in flight. The better question is the ancient one: what is a fully developed human being?

Aristotle gave the answer its lasting form. The end of life, he taught, is *eudaimonia*, which we translate poorly as happiness and better as flourishing: the exercise of our powers in accordance with virtue, over a whole life and among friends. Virtue in this old sense is a habit before it is

an opinion; we become just by doing just things, as we become builders by building. Confucius complained, as we might, that the ancients learned in order to improve themselves and his contemporaries in order to impress others. Both held that learning is for the sake of living well, and that knowledge alone does not secure it. A school is therefore concerned with what its students will love, to whom they will be loyal, what they will refuse, and whether they can tell the true, the good, and the beautiful from their counterfeits. The person who solves a problem at a desk must also be a friend, a member of a family, and a citizen, and no examination certifies fitness for these. Nor is learning a private possession. It was made by others and handed down, and whoever receives it is in debt both to those who made it and to those who come after.

The distinction that matters most is between intelligence and wisdom. Intelligence finds means; wisdom chooses ends. In 1930 the universities of Germany were among the most admired on earth. Within three years their students were burning books in the public squares, and many of their professors had welcomed the regime that dismissed their colleagues. A civilization may grow more ingenious without growing more humane, and an age about to place great ingenuity in every hand has particular reason to remember it.

The Renaissance answered in its lives more than in its treatises. Leonardo entered Verrocchio's workshop as a boy and became in time a painter, an engineer, an anatomist, and a musician, because no one had told him these were separate professions. The humanists of his century prized, in the phrase Montaigne would later use, a head well made above a head well filled. Our own age has done the opposite, dividing knowledge into ever narrower provinces until the specialist can speak to no one beyond the border. Yet narrow competence is exactly what the machine supplies most cheaply.

The minds worth forming are of a particular kind, and their marks can be named plainly:

Breadth with depth. Command of one discipline to the point of original work, joined to real literacy in mathematics, the sciences, history, letters, and the arts.

Judgment. The power to ask the right question, weigh evidence, detect the plausible falsehood, stand against a crowd that is mistaken, and decide when the facts are incomplete.

Expression. Clear writing and persuasive speech, which Quintilian held to be inseparable from good character.

Making. The habit of building real things with hand and mind, of finishing them, and of caring that they be beautiful as well as sound.

Command of the machine. Fluency in directing artificial intelligence as a craftsman directs tools, knowing its powers and distrusting its errors.

Character. Honesty, courage, and a sense of obligation to family, friends, and fellow citizens, without which every other gift becomes a danger.

Such a mind is educated for more than escape from replacement. It is educated to choose its purposes, to answer for its actions, and to make worthy use of whatever powers its age places within reach.

V

The Company of Minds

No one was ever educated alone. The Academy was a grove where friends argued. One of the first universities, at Bologna, was by its very name a *universitas*, a guild, formed in the twelfth century by students who hired their own professors and fined them for lectures that ran late or left the material unfinished. In seventh-century India, the Buddhist monastery of Nalanda gathered several thousand students and teachers from across Asia for study and debate. The Chinese monk Xuanzang, who came to join them, recorded that they debated from morning until night, the old helping the young and the young the old.

The lesson is constant. Learning is a social act, and a mind is sharpened chiefly upon other minds. The solitary student before a screen, however clever the software, receives half an education. The tutor we have described must therefore never be the whole of the school.

Company is worth little, however, if it only agrees. John Stuart Mill observed that a man who knows only his own side of a case knows little even of that. A school must therefore keep its doors open to rival ideas and protect those who hold unpopular ones. The German universities of the nineteenth century named the two liberties on which the rest depend, the freedom to teach and the freedom to learn. Their discipline is old and simple: state an opponent's view so that he would own it, give reasons, and yield to better ones. It matters the more in our time, because a machine built to please will tell each of us what we already think. The tutor must be made to dispute with its pupil, and the pupil sent among people who see the world otherwise.

Every learner should be set among a small company of peers who dispute, build, and answer to one another. This company is the daily bond of the school. Within it the elder student teaches the younger, as the journeyman once taught the apprentice, and gains by it as much as is given. Seneca observed that people learn while they teach.

Such a company can govern much of its own life, and should. The students of Bologna chose their own rectors and made their own statutes, and the university they shaped endures to this day; but the doctors kept the examination and the degree in a college of their own, and the division was sound. Students who mentor their juniors, organize their own projects, keep their own order, and have a voice in the life of the school learn responsibility by the only method that has ever taught it, which is its exercise. The standard of the work, the integrity of its assessment, and the granting of the degree remain with the faculty, who answer for them, and each party is accountable to the other.

The teacher's office is thereby raised. Relieved of the repeated lecture, teachers can do what only they can: set the standard, guide those who lead, judge the finished work, and show by example what a life of the mind looks like. Few students in any age have had a master's daily attention, but every student can belong to a company that a master guides.

This company should span the earth. Talent is born everywhere; opportunity is not. A student in Lagos, Lima, or Lahore deserves the same tutor and the same standard as one in London. Each will learn from the others what no curriculum contains, which is how the world appears from somewhere else, and the lesson is complete only when they have disagreed about something that matters and remained colleagues.

VI

The Workshop of Discovery

A school that only hands down what is known is a museum. To hand down is the first of its duties; the second is to add to what it has received, and the third is to put it to practical use. The monasteries of the early Middle Ages are remembered chiefly for the first. We owe them the survival of Virgil and Cicero. But a civilization that only keeps is living upon its capital. Athens under Pericles, Baghdad under the Abbasids, and Florence under the Medici performed all three duties. They taught what was known, they advanced it, and they set it to work in temples, hospitals, and banks; and in each of them the scholar, the discoverer, and the builder were often one person.

Our own schools have separated what those ages joined. Teaching is left to one class of institution, discovery is reserved to another, and the use of knowledge is abandoned to the market, while the student, who ought to be heir to all three, receives a diminished portion of the first. It is commonly supposed that discovery belongs to the great research universities alone. History does not support the supposition. The research university is a recent invention, commonly dated to the founding of the University of Berlin in 1810, and much of what we know was found before it or outside it.

When Oxford and Cambridge would grant them no degrees, the English Dissenters built small academies of their own. At Warrington, where Joseph Priestley taught, history, modern languages, and the sciences were studied while the ancient universities dozed. The Lunar Society of Birmingham, a dining club of manufacturers and physicians that counted Watt, Boulton, and Wedgwood among its members, did as much as any faculty to bring on the industrial age. Faraday was a bookbinder's

apprentice who never attended a university. The Bauhaus lasted fourteen years, never held more than a few hundred students, and changed the look of the modern world.

These examples share a pattern. Discovery came from small companies of able people, working on real problems, close to the making of things, and free to cross the boundaries between crafts. That pattern can be reproduced anywhere, for the instruments of inquiry that once belonged to a few rich institutions, the great library, the power of calculation, the means of publication, are now within reach of any serious student.

The largest instruments of science will remain with the largest institutions, and no small school should pretend otherwise. But a great deal of new knowledge is of another kind: the method improved, the tool invented, the problem of a particular place solved for the first time. This is open to all. The scholars of the Enlightenment understood it when they compiled their *Encyclopédie* from the contributions of more than a hundred hands. So does every student today who adds a sound piece of work to a common store that others may freely build upon.

The third duty is to carry knowledge into use. Its name is enterprise, and the word should mean something wider than commerce: the founding of a company, certainly, but also of a clinic, a school, an orchestra, a public work. When Booker T. Washington opened a school at Tuskegee in 1881, he was twenty-five and the school had no buildings of its own. He had his students make the bricks and raise the walls themselves. Three kilns failed; he pawned his watch to fire a fourth, and it held. Two generations later a professor of engineering in California, Frederick Terman, urged two of his students, William Hewlett and David Packard, to found a company near their university instead of taking posts in the East. They began in a rented garage in Palo Alto in 1939, and the valley

around it became the workshop of a new industry. Students should attempt real ventures with real consequences while they are still students, when failure is cheap and counsel is near. Nor need the three duties wait their turn. From the first year a student can inherit, inquire, and make at once, as apprentices always did, with the tasks growing harder as the years pass.

VII
Proof by Work

When a machine can produce a passable essay in a moment, the essay written out of sight ceases to prove anything, and with it falls most of the modern apparatus of examination. We do not mourn it. The craft guilds of late medieval Europe knew a better way: the journeyman who wished to be called master submitted a masterpiece, a work of his own hands, judged by those who practiced the craft. The medieval university knew another: the disputation, in which a candidate defended a thesis aloud against all comers and could not hide behind a page.

Both should be restored. Students should advance by demonstrated mastery and not by time served, moving swiftly where they are strong and lingering where they are not. A calendar measures the patience of an institution and nothing about a mind.

The masterpiece worth asking for is a real contribution: a discovery, a working invention, a venture, a piece of art or scholarship that did not exist before and that someone outside the school has reason to value. The student should explain and defend it before people qualified to doubt it. In this the machine has a part and a limit. What can be plainly shown, that a student can solve the equation, parse the sentence, or write the working

program, a machine may examine daily and report, subject to a teacher's check. The higher attainments do not reduce to a score. Whether an argument is wise, a reading of history just, a design original, or a decision right must be judged by persons of experience, who will sometimes differ and who put their own names to the verdict. A sound school uses both kinds of proof and does not mistake the first for the second.

History warns us to guard this carefully. China's imperial examination, admirable in its principle of openness to talent, hardened over the centuries into the eight-legged essay, a ritual of form that rewarded memory and discouraged thought. Every system of credentials drifts toward that fate. The safeguard is a simple rule: nothing counts that the student cannot explain, defend, and stand behind as their own.

VIII
The Articles

We hold, therefore:

I That education is the means by which a civilization survives its own generations, and its neglect the beginning of decline.

II That a school has three duties: to transmit knowledge, to advance it through discovery, and to carry it into use. These duties belong together at every stage of education, and every student, in any school great or small, shall take part in all three, and may lead in them.

III That the end of education is human flourishing: a good life, of which worthy work is a part and not the whole. Wisdom and character therefore belong to the curriculum, since knowledge without conscience is merely power.

IV That excellence and access are allies. Students may arrive by different roads and travel at different speeds, but all shall be held to one high standard.

V That every learner is owed a tutor, and that the machine may help to make this debt payable. It shall never do for a student what the student must do in order to learn, and it shall remain under human judgment, with its effect upon learning measured and published.

VI That breadth is no luxury. The sciences and the humanities are one inheritance and shall be taught as one, together with the command of the tools of the age.

VII That no education is complete without the fellowship of other minds, and that to teach another is among the surest ways to learn. Distance shall not deny a student that fellowship, nor shall a school mistake connection for community.

VIII That inquiry shall be free. No doctrine is exempt from question, and those who dissent in good faith shall be heard and protected.

IX That students shall share in the government of their school and so learn responsibility by its exercise, while the faculty answers for standards, assessment, and degrees.

X That teachers are to be elevated and not replaced, relieved of repetition so that they may guide, judge, and set the standard.

XI That advancement follows mastery, and that mastery is proved by work, by examination, and by defense before those qualified to judge it.

XII That this education shall be open to talent wherever it is born, at a cost no family need fear, and shall remain a companion to the whole of a life.

IX
The Examination

Nothing in these articles is new. What would be new is a school that kept all twelve at once, and for every student. Some schools already practice many of them, and a few come close to the whole. They are owed honor, and no question here is meant to diminish it. Yet the readiest answer to pages such as these will be that they describe what is already done, and that answer deserves what Socrates gave every confident answer in Athens, which was another question. He held that the unexamined life is not worth living. The unexamined school has no better claim. What follows is therefore put as questions, since each institution alone knows its answers.

"Our reputation speaks for us." Ask what a ranking counts. Where it counts wealth, selectivity, and the esteem of rival institutions, it measures standing, and says nothing of what a student learned.

“Our graduates prosper.” Many do. But ask who they were on the day they arrived. A university that turns away nine applicants in ten, and chooses the tenth for having already excelled, has proved that it can select. Whether it can teach is a separate question, and the success of its graduates does not settle it. Ask whether the school has ever measured what its students can do on leaving that they could not do on entering. Ask whom the gate kept out, and what became of them.

“We prepare our students for careers.” So should every school. Ask, then, how many graduates are at work in the field they studied, at what wage, and under what debt. Ask also whether they were prepared for a first post that may soon be replaced, or for a working life.

“Our faculty are distinguished.” Many are. But to discover is one gift and to teach is another, and excellence in the first is no proof of the second. Ask who meets the first-year student, on what terms that instructor is employed, and whether anyone there has been promoted for teaching well.

“Few pay the full price.” Then ask why it is published, and how many able students read it and never applied. Ask what the graduate owes on the day of graduation, and what is owed by those who left without the degree.

“Our doors are open to all.” That is the nobler half of the modern bargain, and it is only half. Ask how many who entered have finished, and what the degree required of those who did. Admission is a promise, and only an education keeps it.

“We teach thousands online.” To reach them is no small thing. But ask who designed the course, and whether the professor whose name it bears does more than grade the papers, or leaves even that to an assistant or a

machine. Ask what passes there for conversation. Where a student posts a paragraph because a rule requires it, and classmates reply for the same reason, the requirement of interaction can be met while no one is taught.

"Our students are satisfied." Ask whether they were pleased or taught, for the two can part company. In one careful experiment, students judged that they had learned more from a polished lecture than from the harder exercise that had in fact served them better. A school that steers by satisfaction alone will drift toward ease.

"We have adopted the machine." Ask what it is asked to do. A machine that answers has only to be switched on; one that questions, withholds, and reports to a teacher has to be designed. Ask whether anyone has measured what the students learned.

"We have forbidden the machine." Ask whether the rule holds once the student is out of sight. Ask also what the graduate will do on meeting, the day after graduation, the instrument the school declined to teach.

"Our students already do research." Ask how many, and in which year of their studies. If discovery and enterprise are kept for graduate students, the final year, or the favored few, they remain a privilege of some and have not yet become the education of all.

"Our standards are high." Ask what the transcript shows. Where the commonest mark is the highest, the mark no longer distinguishes anything. Ask what a credit certifies besides hours spent. Ask whether each graduate has once stood before people qualified to doubt the work, and defended it.

“Inquiry is free here.” Ask when the school last gave a fair hearing to a view that most of its faculty reject, and whether students say in the seminar what they say in the corridor.

A few will give two answers at once: that all of this is already done, and that none of it can be. Both cannot be true. To the second the honest reply is that no one yet knows. These pages claim only that the attempt has become possible, and that its results must be measured and published, the failures with the rest.

These questions accuse no one. A school that can answer them well has nothing to fear from them, and a school that cannot has more to gain from the asking than from any praise. We ask them first of ourselves, and know how far we have still to go. Reform begins when a school ceases to suppose that it already does these things.

Coda

History offers few second chances, and this is one of them. When the press of Gutenberg began to multiply books, a learned abbot wrote in praise of the scribes it would displace, and sent his treatise to the printer. Within two generations the presses of Europe had issued millions of volumes. Scripture, Euclid, and Cicero, once copied by hand for a few, were for sale in some hundreds of towns, and Europe was remade. The tool did not decide the outcome. The use made of it did.

We stand at such a turning. The same machine that can hollow out the schools may yet help to give every child on earth the tutor that once belonged to princes. To automate the school as it stands would be a small ambition and a sad one. The larger is to bring the highest forms of human

education within reach of mankind without the loss of their rigor, their depth, or their company. Which it is to be will be settled within a generation, by those who build.

We inherit a civilization that none of us made, kept alive by generations whose names are lost: the scribe at his desk, the mason on his scaffold, the teacher in a village school. To be educated is to receive that inheritance with gratitude, to examine it with an independent mind, to put it to use, and to hand it on enlarged. The measure of a school is therefore larger than what its students become. It is what becomes possible for mankind because they were taught. The inheritance is unfinished, and each generation holds it in trust for the next.

What is wanted is an education as exacting as the Academy, as personal as Aristotle's hours with Alexander, as self-governing as Bologna, as inventive as the workshops of Florence, and as wide as the world. Plutarch wrote that the mind is no vessel to be filled, but wood to be kindled. There has never been so much kindling, nor so many waiting for a spark.

Author's Note

I author these pages as a student of their ideas, one who believes in them and aspires to put them into practice. I do so in full recognition that they draw upon centuries of thought and the work of countless educators, past and present.

I watched the millennium turn in my youth, and with my peers witnessed the rise of online education and its promise to make learning accessible to all, only to find that access alone did not guarantee a meaningful education. We now witness the arrival of reasoning machines, and with them the possibility of overcoming limitations that once seemed unavoidable. This manifesto is a manifestation of the frustrations, hopes, and questions shared by many of my generation, and of our conviction that we can do better.

I was fortunate to be educated at Arizona State University under the mentorship of its president, Dr. Michael Crow. There I saw what was possible when an institution refused to choose between access and excellence. There, too, I was given the opportunity to demonstrate a model in which the students themselves are the principal researchers, inventors, and creators. These experiences shaped much of what I believe education can and should be.

I have recently been given the privilege of leading an institution founded in 1887. Years of recent hardship have given it the will and the capacity to change, in keeping with its founder's original charter. There we mean to build the education described in these pages, and we expect it to be the labor of years. Yet these twelve articles belong to no single institution. They are our aspiration before they are our achievement, and we ask to be held to them as we begin this endeavor.

I call upon all who lead institutions of learning, and all who have the power to shape them, to make these articles their own. Let them be questioned, amended, and enlarged as freely as they are given here. Let us together take up the unfinished inheritance, and pass it to our posterity greater, better, and more beautiful than it was entrusted to us.

Dr. Mark Naufel