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DIGITAL DEMOCRACY:

A SERIES OF REFLECTIONS ON PLATO, ROUSSEAU AND
DEWEY AND THE ROLE THAT TECHNOLOGY PLAYED IN
CONSTRAINING AND LIBERATING THEIR
IMAGINATION, THE PLIGHT OF EDUCATIONAL REFORM
IN THE MIDST OF DIGITAL INNOVATION, AND THE
POTENTIALITY OF DANTE IN THE TRANSFORMATION OF
EDUCATION INTO A RELEVANT, INTEGRATED AND
DEMOCRATIC INCUBATOR FOR CITIZENS

by

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ABSTRACT


Jennifer Ann Hogan

The aspects of educational institutions and the systemic practice of education are the product of 2 distinct features of education. The first is the institutional practice of a chosen philosophy of education. The second is the technologies that have afforded the facilitation of information production, consumption and distribution—essential processes of education. Taking advantage of major reform opportunities in educational practice, made possible by an emerging digital information system, the current trend in education tends to relinquish the long tradition of philosophy of education and embraces the cultivation of a reflective and productive citizenry through education. However, by looking at the ways in which the technologies of their time constrained or enabled the imaginations of our most influential philosophers of education (Plato, Rousseau and Dewey), we will better understand how real technologies and ideal philosophies are necessarily related. With such knowledge, we may inform our educational reform alternatives with the goal of developing a democratic citizenry through education. In no way, is this dissertation meant to provide specific recommendations for educational reform, though the Digital Dante case study illustrates some possible reform alternatives. Rather, it is
meant to demonstrate the ways in which technology and philosophy, educational institutions and industry and K-12 and higher education are all necessary players in the goal of creating a new form of civic education.
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Acknowledgments

I have heard colleagues speak of how isolated and lonely the process of writing a dissertation can be. At times, I’ve felt alone in my thoughts, typically due to what I perceive to be the early stages of thought for which I lacked the words to properly communicate my ideas, but never lonely. I have been surrounded personally and professionally by individuals who care immensely about education – and with whom impassioned and insightful communication helped write this dissertation, shape my ideas, and perpetuate my commitment to exploring the needs of a publicly responsible system of education and the meaning of digital technologies for it.

First, and most significantly, I owe the opportunity to have engaged myself so fully in a rather eclectic and expansive study whose ends were never really clear, to my academic advisor and mentor, Robbie McClintock. If every graduate student were awarded with the kind of mentoring that Robbie has provided me, public discontent with the relevance of academia and student discontent with the quality of degree programs would evaporate.

This is a work that is the product of thoughts that have consumed me and experiences that have busied me for the past 7 years. I do not mean to exaggerate the importance of this work by assuming that gratitude to a multitude is necessary, yet I do want to appropriately acknowledge those who constituted the important web of discourse and support and allowed me to nurture this work to this stage. If not for the intellectual courage of Teodolinda Barolini to explore with me the meaning of Dante to some public school children in Harlem, the project itself and what we’ve learned from it, could not have been grown as it has. The Provost Office at Columbia allowed me the funds and intellectual freedom to grow the Digital Dante project as a research associate at ILT.

The reflective banter that can only come from intelligent individuals who care has been invaluable to my growth as a student, educator and active citizen. Columbia has effectively cultivated such a community. As such, it has been one in which I’ve been afforded the opportunity to think publicly and oftentimes argue with many individuals including Marianne Bakia, Pat Nicholson, Chris Tucker, Bhaven Sampat, Kathleen Boyer, Shawn Mishler, Kim Taipale, Bob Matsuoka, and many others. Each has allowed me to grow my ideas and bring me closer to the kind of moral conviction necessary to live one’s life fully. There were even folks who took on the burden of reading my writing in its early stages and help me say what I mean. To these individuals, including Patrick Jameson, Jinx Roosevelt and Margaret Edsall, the reader and I own many thanks.
I doubt that my work would ever have begun if it were not for my parents who cultivated in me both a strong work ethic and an interest in bettering the world, and encouraged my interests unconditionally.

And to Scott whose loving support and intellectual toughness ensured the completion of this manuscript to the point whereby it with high approximation represents my current ideas about the state of education, allowing me to take on new explorations and work to improve the quality of our schools.

JAH
Chapter I

DIGITAL DEMOCRACY: RE-THINKING SPONTANEOUS CHANGE IN EDUCATION IN THE CONTEXT OF DIGITAL INNOVATIONS

Wise and prudent men -intelligent conservatives- have known that in a changing world worthy institutions can be conserved only by adjusting them to the changing time.

Franklin D. Roosevelt, speech, Syracuse, N.Y., September 29, 1936

The future offers very little hope for those who expect that our new mechanical slaves will offer us a world in which we may rest from thinking. Help us they may, but at the cost of supreme demands upon our honesty and intelligence. The world of the future will be an ever more demanding struggle against the limitations of our intelligence, not a comfortable hammock in which we can lie down to be waited upon by our robot slaves.

Norbert Wiener, God and Golem, Inc., 1964

Digital Dante Sets New Standards for Public Education

From January to June 1997, a group of tenth and eleventh grade students at the Frederick Douglass Academy (FDA) undertook their own study of Dante's Divine Comedy. FDA is public school in central Harlem, New York. It opened its doors in 1993 after its previous school tenants had to be shut down for its poor performance by the New York City Board of...
Education. Though FDA has its own good academic standards and is one of our public school system's success stories\(^1\), it is generally considered to be tiers below superior private schools like Collegiate or Trinity. FDA students' median SAT's scores were about 1,000 in 1996 and only two students went on to what were considered highly competitive colleges.\(^2\) SAT scores at Collegiate consistently average hundreds of points higher, and it is not unusual for a majorit\(^y\) of its students go on to highly competitive colleges. FDA's curriculum is not rooted in the Western core\(^3\), and the Dante study was a first at the school. Rarely do high schools attempt to teach Dante's works. Those that do are usually private, and only the Inferno is studied. Many people expect that the social problems that challenge our public schools, particularly in urban centers, prevent them from teaching difficult works like The Comedy. My own experience with the FDA Dante class runs counter to this assumption. In fact, the FDA Dante class supported my beliefs that

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\(^2\) Heather McDaniel (then the College representative at Frederick Douglass Academy), personal interview, 5 May 1998.

1) The humanities and the liberal tradition are still powerful tools for educating young minds for intelligent and reflective citizenry.

2) All students can benefit from a general education. And

3) Civic education can be achieved democratically for the first time in history through the World Wide Web and emerging technologies.

The FDA Dante class ran for a full semester. In these five months, the students read Dante's *Divine Comedy* in its entirety: the *Inferno*, the *Purgatorio*, and the *Paradiso*. Some of the students were self-selected. Others were chosen by one of two English teachers at FDA who had helped design the course; these students were not chosen because of their academic excellence, but because, in the opinion of the teachers, they could most benefit from the class. Because the poem is extremely difficult to read and understand and

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4 Sandra Loyd Blackman and Joan Hazzard both taught English at FDA. Loyd Blackman took on the primary teaching and curriculum development role and would later go on to develop a Dante course on art and architecture. Hazzard's role was primarily that of a technology consultant whose background in English grounded the project in content.

5 In fact, one of the students had been diagnosed with a learning disability, unbeknownst to those of us from ILT.
was unfamiliar to this group of students, they were supplied with a number of tools for making sense of the work through Digital Dante (http://www.ilt.columbia.edu/projects/dante/), an online Web site devoted primarily to Dante's Divine Comedy, and developed by the Institute for Learning Technologies (ILT) of Teachers College, Columbia University. In class, Gustave Dore's illustrations and Sandro Botticelli's drawings from Digital Dante's Image Collections were used to help the students imagine events in Dante's poem (see fig. 1). 

6 The Dore illustrations and Botticelli drawings comprise a substantial subset of the digital images available from the Digital Dante site. By finding copyright free images and scanning them into a digital format, students and scholars alike can view, copy and cite the images in their Dante studies. The found images began the visual section of Digital Dante which has since come to include images that contemporary artists have created and submitted to the site.
There are over 1,000 images in the Image Collections. All are set up in this way. That is, the images are listed and will open up in a new window. This allows teachers and other users to display multiple images at one time, comparing and contrasting at will.

Students used Digital Dante’s search engine to filter through hundreds of pages of text including the poem itself, scholarly commentary and other
students’ work. This allowed them to expedite their interpretations of various figures in the poem including Ulysses, Pope Boniface VIII, and Beatrice7.

For most FDA students, the technology was the most compelling reason for taking the Dante class. Some thought they would learn valuable computer skills. Others thought the technology component would distinguish them from other students and increase their chances of getting into a good college. Most thought the computers would make the class fun.8

The students had little knowledge of Dante or The Comedy. In addition to enticing them, the technology offered the students the tools and resources necessary to express their own interpretations of Dante’s poem and their opinions about their own society. These expressions took shape in multimedia depictions of Hell, Purgatory, and Paradise (see fig. 2). The projects were replete with contemporary political figures and are vivid examples of the power of multimedia for unleashing creativity.

7 In Dante’s Comedy, these three figures are poignant examples of the many figures that have meaning for the poem beyond the role they play in the plot. Ulysses is often understood as Dante’s antithesis, Boniface as Dante’s personal nemesis, and Beatrice as his inspiration for the poem.

8 All of this data was extracted from an informal evaluation done by Marianne Bakia and Jennifer Hogan of the Institute for Learning Technologies that consisted of entrance and exit surveys, class observations, and interviews collected from Fall 1996-Winter 1997. The foundational hypotheses about the course were the consequence of the initial Dante course at the Collegiate School in NYC. See Appendix B for the Collegiate Digital Dante Evaluation.
The students spent entire weekends researching on the Web for the projects, both in Dante studies and contemporary politics, and creating their own interpretive visions of *The Divine Comedy*. To produce their multimedia arguments (these were largely image maps on the web), the students were forced to read and internalize Dante’s entire *Comedy*. They also researched contemporary politics extensively. For most of the students, this was their
first opportunity for serious research. They also had to master the
technologies to express their arguments; this was not an insubstantial task
because most of them had never even surfed the Web before. Not recognizing
that all of this was work when they used the computers, the students
produced some compelling interpretations of Dante's poem and their own
society. During the month before their final projects and presentations were
due, the students regularly spent ten-hour days at Columbia University on
ILT's networked computers researching Dante and politics, and creating their
projects.

Even when not using new technologies, many students arrived at a
sophisticated understanding of difficult parts of The Divine Comedy. In an
effort to understand the complex relationship between individual and society,
which is a central theme in the poem, one class lesson was devoted to Dante's
distinction between his own personal nemesis, Pope Boniface VIII, and the
social nemesis, Lucifer, whom he deems most dangerous to society. The
students were asked to identify their own personal nemesis and what they
perceived to be the greatest danger to society. One student opined that the
welfare system in the United States poses the greatest danger to society
because it forces a class of people to remain dependent on it to survive and
yet offers no incentive to get off it. Class discussion ensued passionately with
suggestions made, for example, that a reactionary move to an agrarian
economy would allow everyone to produce all that he needs and would
improve the quality of life for most citizens. The economic and political analyses in some ways evoked the ideas presented by Marx in his descriptions of the growth from feudal economies. The complexity of thoughts and the impassioned discussions proves both the richness of an age old, yet difficult work, like Dante's *Divine Comedy* for contemporary students in urban settings, as well as the capacities of students — when they and their teachers are afforded the resources necessary for a challenging, but relevant education. The students concluded their day's discussion with a better understanding of Dante's poem, why the personal and the social often require different priority scales, and contemporary economics and politics. These consistently impassioned and sophisticated class discussions could not have occurred unless the students had cumulatively acquired some understanding of or interest in Dante's poem. The technologies not only enticed them, but also allowed the students to comprehend the poem. Ultimately, the technologies allowed the students to make substantial leaps in their understanding of society and their role in it. The FDA Dante class internalized and practiced the aims of a general education by broadening and deepening students' understanding of life as a whole through their study of Dante.

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Insofar as a general education aims at an understanding of the complexity of human behavior and situations\(^\text{10}\), it is our best hope for educating our most underprivileged youth. Through a general education, they will acquire the tools they need—intellectual, imaginative, and idealistic—in order to transcend imperfect situations and consciously direct the course of their own lives. These are the skills that are necessary for all members of a democratic society and should be the aims of our public school system.

The Digital Dante experiment offers a nice introduction to the ways in which educational institutions can work more effectively together to achieve political and social expectations of the educational process. The project, initiated as it was out of a research and development institute (ILT) of a major research university (Columbia University), shows how digital technologies help unite various higher educational institutions, including research universities, and K-12 institutions in a common educational mission for the improvement of all institutions. Understood within the context of technological innovation as a product of collaboration between industrial, educational, and governmental organizations, Digital Dante demonstrates how the existing system of innovation can be improved by alliances between educational institutions and among education, industry and government organizations for the improvement of our schools towards a more reflective

and responsible citizenry. Hence, by coming to understand the complexity of this national innovation system and its relationship to improved educational practice, we will be able to imagine an improved educational system.

Digital Technologies and the Occasion for Democratic Education

The purpose of this study is to argue that digital technologies now afford us the opportunity to create an educational system that by promoting both excellence and equitable access becomes truly democratic for the first time in history. In the past, only an elite segment of society had access to great schools at all levels. Not only did these students benefit in terms of career opportunities, but also the quality of instruction at great schools prepared them to participate fully in democratic institutions and become leaders in all fields. But with the current digital revolution, all members of society can soon have access to the same quality resources and level of instruction that only top schools have offered in the past.

Through digital technologies, scholarly libraries are being created and made available to everyone by way of the World Wide Web. Currently, universities and colleges all across the country are putting more and more resources online in an effort to facilitate the ability of their own students to

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access class materials; these universities include Columbia, Harvard, and Princeton, some of our most prestigious educational institutions. In effect, Ivy League quality materials are available for everyone who has access to the Web to use (see fig. 3).

Fig. 3. Harvard University: Museums.1999. Harvard University. 22 July 1999 http://www.harvard.edu/museums/.
Internet search engines like Yahoo or Lycos simplify access to and filtering of millions of documents. In addition, many Web sites have their own search engines and allow the user to go directly to the documents, and even a precise location in the documents, where a key word or concept is named. Further, images, sound, video, and simulations are important components of the online libraries.

Digital technologies also facilitate the orchestration of different kinds of media into a single record that may either become part of course material or an object for expression like the multimedia depictions of Hell, Purgatory, and Paradise by the FDA students. For centuries, schools have been constrained by the printed word when teaching and studying about the world, its people, and history. Images of cultural artifacts, video clips of world events, and simulations are often more effective educational tools than print, but the integration of resources other than print in the classroom has been difficult. Hence, students’ experiences with such educational tools were limited to a single trip to a local museum or the occasional videotape. Now, by way of the Web, students can access representations of many of these artifacts and other materials online at their own convenience from all over the world. The facilitation of diverse media into the study process

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affords educators the opportunity to integrate cultural artifacts into public education and move us closer to achieving an education that does in fact synthesize the cultural and the personal, a key aim of a general education.\textsuperscript{13}

Educators are publishing their own class syllabi and content materials on the Web (see fig. 4).

\textsuperscript{13} Harvard Committee, \textit{General Education In A Free Society} (Harvard University Press, 1945) 75.
shot of a number of fully hypertexted syllabi from Fordham University for Byzantine courses. The syllabi contain links to many images, traditional print references as well as online materials.

These include collections of exemplary Web sites and self-created charts and papers. By making them available to other teachers around the globe online, teachers have begun to share the expertise that had been the wealth of only private or elite institutions. As teachers continue to share pedagogical resources and insight about what constitutes good class content, access to good teaching and quality education becomes an opportunity for everyone.

Most important perhaps, digital technologies are affording us the opportunity to engage traditionally disenfranchised students in an education that will prepare them fully for participation in a democracy. Ironically, as this goal becomes more of a possibility, the technology itself and educational leadership are pushing us away from this vision. For thousands of years we have been striving for the actualization of a transformative educational system, transformative in the sense that we have expected education to transform the intellect and character of all youth into responsible and self-willed adults, and enable them to participate intelligibly and productively in society.
Ideals of Transformative Education in the Tradition of Plato, Rousseau and Dewey and Its Influence on the History of Education in the US

Our greatest educational philosophers, Plato, Rousseau, and Dewey, have posited ideals of a transformative education in their most prominent philosophical treatises, *The Republic, The Emile, and Democracy and Education*, respectively. What each of these philosophers holds in common is a philosophy of education, that is, an *ideal* of education that informs its practice and implementation. There will be some counter-perceptual arguments posed about the similarities between Plato, Rousseau and Dewey. I ask the reader to suspend critical judgment, for by the end of this work, their unification may become more clear. An historical analysis shows how our most influential philosophers of education have similar educational ideals. The practical recommendations of these philosophers have varied (which we owe to cultural and technological constraints), but have always moved progressively towards a more equitable and excellent image of educational practice. The consistency in the educational ideal throughout history, the progress towards its actualization, and the recognition that such a perspective is necessary for the fulfillment of a democracy, are compelling reasons to give it close consideration at this time.
In this study, I will refer to educational theories that hold clear and general aims as "teleological" theories. Historically, a teleological perspective dominated educational philosophy worldwide and the formal practice of education in the United States until the end of the 19th century.¹⁴ Teleological refers to the process of educating towards a comprehensive telos, whether it is religious, transcendental, or aesthetic. The educational goals are general in that the acquisition of specific skills is less important than the acquisition of a general way of thinking. Thus, a teleological education aims to transform the individual into a self-reliant thinker by educating for both intellectual skill and moral conviction.¹⁵ One should be reminded that the mission of our public system of education is that we require our youth to participate in learning with the expectation that it will prepare them for responsible participation within a democracy; the public school system assumes a teleological end.

Liberal arts colleges are some of the most salient examples of teleological philosophies in practice. Designed to meet the need for leaders in religion and politics, the mission of liberal arts colleges was to prepare young


men for religious and political careers, using the Western Core as subject matter to hone the skills of reading and writing, methodologies essential for interpreting and commenting on self and culture. Such missions dominated higher education in the late 1700's and 1800's.

The liberal arts tradition is still present in our higher education system, but has become much less visible and influential in higher education.\textsuperscript{17}

**Democratic Schooling in the US and Its Challenges**

In the United States, the minimum amount of schooling required of all citizens is mandatory. The general expectation is that all students will complete high school to satisfy this minimum requirement. Although higher education is becoming more and more accessible to all members of society, it is generally accepted that a high school degree is sufficient to prepare individuals to act reasonably, responsibly and productively in society, as reflective citizens. This schooling is public and free. It is not so much a gift to every citizen as an essential component of achieving productive and self-reliant status in society. We expect that citizens require intelligence to participate in the polity. Well above and beyond the act of voting, citizens

\textsuperscript{16}The curricula in liberal arts colleges vary, but all sustain a commitment to the study of arts and letters with a general education goal.

must learn about the implicit as well as explicit social factors affecting their own rights and responsibilities. A general education for participation in a democracy is as much about learning the system and the values on which it was founded as it is about acquiring the skills to make good judgments with respect to these values. As our society becomes increasingly global and technological, the intellectual capacities required of citizens become greater and more complex. What has always been a difficult task for high school administrators and educators is becoming even more difficult. As such, our schools are losing ground in achieving their democratic mission.

Most often, academic test scores are cited as evidence that public schools are failing in their mission. More compelling and relevant, however, is the observation that there are students who have graduated from our public schools unable to utter a grammatically correct sentence, write a coherent paragraph, or take a position on an issue supported by reason.

Students who graduate with only high school degrees are unprepared for most jobs, and those for which they are prepared do not pay enough to live reasonably well. As our society becomes increasingly global and complex, the demands placed on citizens for to manage information and make good judgments are inevitably greater than what public schools have

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prepared them for. Private schools are in a better position to afford the
technologies, tutoring, and teachers that make a good high school education
possible. Indeed, many experts surmise that the gap between the have's and
have not's is widening more than ever before because of the new
technologies.\textsuperscript{19} While, this problem of distribution is fairly easy to solve
financially, we have only now, in fact, begun to move towards resource
equity.

Of course, it is one thing to even the playing field with regard to
resource distribution, but quite another to provide everyone with excellence
in education. It is clear that digital technologies have the capacity to improve
educational practice in some ways. In particular, the digital libraries,
multimedia resources, and reflective communication between educators,
researchers, and students on the Web can improve general practice and
reform possibilities in schools. Access to quality information resources alone,
however, cannot improve our schools. In order for information to produce
knowledge, it is necessary that skillful pedagogical guides work with young
students. Teachers need to be aware not only of the technical components of
changing educational practice, but must continue to keep the paramount
mission of education in mind. The relationship between students and

\textsuperscript{19} National Telecommunications and Information Administration, \textit{Falling
Through the Net: Defining the Digital Divide-A Report on the Telecommunications
Gap in America} (US Department of Commerce, 1999)
teachers is a fragile and not particularly well-understood one, albeit critical to the success of democracy. Somehow teachers must create situations for students to challenge themselves, discover and cultivate their individual interests, and work to solve theoretical, moral and practical problems. In working towards the development of a responsible and reflective intellect in students, teachers must be careful not to spoon-feed or give too much information to students. In order to create opportunities for developing intellects, teachers must be well educated themselves. The best teachers are greedy for knowledge and have a substantial command of content but are at the same time careful not to expound exclusively upon the content to their students. Rather, great teachers have the capacity to judge, acquire and utilize content in those activities that are essential to acting as a reflective human being, and they work to cultivate such skills in their students.21


21 Most books on the subject of effective humanistic pedagogy err either in speaking too generally about the system as a whole and fail in providing provocation on “how” or in contrast in being much too specific so as to yield relevance in time. For a stimulating and relevant view on the subject, see William S. Vincent, Signs of Good Teaching (William S. Vincent, 1969).
The Critical Role of Pedagogy in Democracies

It is this concern for the fragility and complexity of the relationship between teacher and student and the importance placed upon the student's role as one of acquiring increasing skill and capacity for responsible and self-directed study that unites the teleological perspectives of Plato, Rousseau and Dewey. Unlike many philosophers of education who are focused on discrete, albeit important, components of the education process, Plato, Rousseau and Dewey tied the education process itself to the goal of a responsible and reflective citizenry. For each, individual happiness and the social good reinforce one another and, hence, make the project of understanding and creating an educational system all the more complex. For each, responsible citizenry requires the capacity for knowledge and social action, neither of which can be achieved through didactic instruction.

Thomas Jefferson wrote in 1786 in a letter to James Madison,

Educate and inform the whole mass of people. Enable them to see it is to their interest to preserve peace and order.... They are the only sure reliance for the preservation of our liberty. 22

This teleological ideal is now possible because of the new technologies. The new technologies are largely transparent and are most valuable for having extended human capacities for knowledge acquisition, distribution, and management. The depth and quality of resources available on the Web allow students to make discoveries for themselves and acquire by exercise the skills involved in making good judgments in a chosen field of study. The range of materials and expertise now available online allows students to internalize the long-term character of the learning process and to continue with their studies as their interest dictates, rather than being limited to class time and teachers' schedules.

The Fragility of Democracy

Ironically, the same technologies that are making Jefferson's ideal possible are also pushing us away from this democratic ideal towards an instrumental model of education. Instead of the participatory ideal posited by Jefferson, they drive educational institutions towards greater specialization and, consequently, separatism. Whereas teleological systems adhere consistently to an overarching value system and aim to provide students with a general education, instrumental systems are positioned to deliver more specific skills and knowledge than a teleological system. In instrumental systems, students play a significant role in shaping educational practice. However, schools are run more like businesses where students sign up and
pay for the acquisition of particular knowledge or skills sets. This mode of practice is entirely contrary to teleological systems that are designed to educate for participation within a community, and in which students' specific desires are almost always overridden by the values of the community. To the degree that most institutions of higher education other than liberal arts colleges educate for accreditation within a particular community, e.g., medical schools for the field of medicine, they are teleological. In reality, however, an instrumental philosophy and practice dominates these schools because, in their increasing specialization, departments have become more segmented, and the differences between scholars within the same discipline are more apparent than what unites them. In an effort to remain competitive and to stand out from their peers, students embrace the reductionism and separatism in their disciplines, thereby decreasing the role that any general commitments to values like responsible and reflective citizenry might have had in their studies.

The educational institutions that sprouted as alternatives to liberal arts colleges have done so in an effort to address particular social needs caused by innovations in technology and as a result, are also instrumental. In the early 19th century in the US, as farms became larger and more dependent on

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industrial tools, agricultural schools were developed to train farmers in the new tools and to respond to emerging agricultural needs. In addition, a labor force to develop and improve upon the tools needed to be educated. In an effort to serve the needs of an increasingly industrial society, two-year community colleges were formed to educate technically skilled workers. Professional schools were developed to provide medical, dental, legal, and business training to would-be practitioners. Last but not least, the first research universities became a central part of the higher education system and an important tool for social well being in World War I and II when the need to find solutions to health care problems and invent methods for defense against warring countries became so great.

Thus, as technologies have become more ubiquitous within society, the methods of schooling have become more instrumental. Insofar as technical skill is an end in and of itself, as opposed to a tool or prerequisite for

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26 These are not arbitrary distinctions. Rather, we will see that most of our greatest philosophers of education can be categorized as either teleological or instrumental thinkers. The category names and delineation are my own contribution, but the general categories are ones that are commonly used in philosophical discussions.
intellectual and reflective action, it is instrumental. Schools are taking greater responsibility for technical training because people need technical skills to function in society. The predominant process in education has become one of delivering to students what they demand, and value judgments play no role in this system. The new technologies like the Internet and videoconferencing have fueled the development of such radically instrumentalist approaches because they facilitate the ease by which students make these requests and teachers answer them. As Arthur Levine (President of Teachers College, Columbia University) has suggested, convenience and quality control are the forces that should drive educational reform, and the supermarket should be our ideal.27

In and of itself instrumentalism is not deleterious and is, in fact, the product of a particular democratic ideal. This ideal, however, differs from that underlying the public school mission and, more importantly, that of a democracy that assumes basic inalienable and incontestable values. Rather, an instrumentalist educational system promotes a concept of democracy in which every individual is free to live as he or she chooses, so long as it does not infringe on another's right. Students (adults and youths) are free to ask of the system what they desire; in turn, the system, representative of multiple

public interests, attempts to meet these requests. An instrumental system presupposes no more elaborate value system other than this. Thus, it should come as no surprise that at the same time as the increase in the number of instrumentalist schools in the late 19th century, individualism as a personal and political philosophy began to have greater influence on American way of life.

As early as the founding of Plato's Academy, philosophical debates erupted concerning the value of an instrumentalist versus a teleological approach to education. The terms, of course, are contemporary, but the issues raised in Plato are the same as today, and the controversy shows no sign of extinction. In general, the controversies have centered on 1) the right of educational institutions to make value laden claims about the goals of the educational process in a democracy and 2) the importance of education in equipping students with the tools necessary to function within society. Of

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28 Teleological systems by definition educate for particular values that are themselves external to any individual's desires whereas instrumental systems work to satisfy individual desires and do not make value judgments about these. The most significant conflict seems to be that in ascribing to a democratic ideal, we have no right to impose values on any member of the system. We will examine later the concept of democracy and the essential values that it requires in its citizens in order to be effective.

29 Teleological systems have tended historical not to stress skills education in practice. Liberal arts colleges are our most familiar examples of a teleological system; through them, we can see that skills and vocational considerations are an extremely low priority in comparison to the project of educating with the humanities and liberal arts for a general education.
course, no causal relationship is being asserted here. More likely, as opportunities for different kinds of education become possible and as freedom to choose how and what education was began to exert its influence on educational institutions, justice and attempts to educate for particular and even potentially oppressive values took a back seat.30

Historically, educational institutions have tended to adopt teleological or instrumental philosophies exclusively. The most impassioned debates about education in the recent past, perhaps exemplified best in Allan Bloom's *Closing of the American Mind*31, have been inspired by this polarization of a teleological *versus* an instrumentalist approach to education. The liberal or teleological approach has been largely identified with education in the classics of Western humanity. The instrumental approach has been largely characterized by an education consisting of the acquisition of skills.

This polarization of the two philosophies is both unfortunate and misguided because the achievement of educational institutions that foster democracy and nurture an intelligent citizenry requires that educational practice be both teleological and instrumental. Our social teleology is


democratic and it is with this end in mind that our schools are designed, but instrumentalism as a method of promoting individual freedom and change must become a regular part of our educational systems, as well.

The translation of philosophy into practice has always been difficult, and this may account in part for the simplistic polarization of the two philosophies of education. Philosophies tend to be idealistic. Implementation, occurring in real and imperfect worlds, can never satisfy all the requirements of an ideal. The tools available for educational practice, e.g., papyrus, print, blackboards, and computers, play an important role in systemically actualizing an educational philosophy in schools. In the past, the visions of many philosophers were not actualized because the tools for doing so had not yet been invented. Thus, the systems that we have understood as teleological or instrumental actually fall short of a genuine actualization of their respective philosophies. The relationship between philosophy and practice, the ideal and the real, never correspond.

Philosophical treatises on education have tended to posit ideal scenarios and are most important for the educational values they propound. Educational systems have generally been constructed with philosophical ideals in view, but have never been clear translations of the ideals. Because their practice involves real tools ill-equipped to attain their philosophical ideals, philosophical ideals and likewise philosophical imaginations have
been constrained by available technologies whenever there is any attempt to translate general ideals into specific practical recommendations.

By understanding how particular philosophers of education have been constrained by the technologies of their time, and how at the same time they have progressed in constructing an increasingly equitable and excellent image of educational practice, we may come to better understand how complex the relationship between educational philosophy and educational practice really is. Furthermore, by understanding how the particular technologies available to Plato, Rousseau and Dewey furthered their educational philosophies and by acknowledging the limits of those technologies in reaching verisimilitude in practice, we will better understand how important an educational telos is for achieving an education system fit for cultivating responsible citizens with an understanding of and capacity for democracy.

It is important to recognize, however, that because an instrumentalist philosophy is in many ways easier to achieve in practice, it has begun to monopolize educational practice. Philosophical reflection directs all intentional educational practice and is integrated into teleological systems as a tool used to measure the achievement of its ideal mission. Problematically, lacking a cohesive or overarching value system other than individualism,
instrumental practice can bolster no philosophical reflection. In this time of radical transition, opportunities for educational reform are more varied than in the recent past, and, therefore, philosophical reflection on education is imperative.

In the first half of the 20th century Dewey dealt with the impact of emerging technologies on education. Since his death, there really have not been any prominent philosophers with an understanding of the effect of technology on educational practice. In Dewey's era, electronic media like the telephone, telegraph and mass rail system were invading public and private practice and prompting utopian prophecies about the next century that tended to be images of a teleological democracy incarnate.

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33 According to Alan Brinkley, what is particularly interesting about the utopian visions of the late 19th century is that this was that the idea that the future might be dramatically different from the past was relatively new. Previously, prophecies about the next century were restricted to relatively minor advances in particular regions of society. Brinkley attributes the extreme expectations to the technological advances of the 19th century to: 1) the scientific method seemed to put all control over social conditions in the hands of man, and 2) electronic technologies had a ubiquitous character that is unlike any other technological innovation. What is interesting from our perspective is that we no longer understand technological innovation and social improvement causally. Our interpretation of technological innovation is much more ambiguous; this only reinforces my point that the new technological innovations must be applied consciously with explicit goals in mind. Alan Brinkley, "Imagining the Twentieth Century: Perspectives from Two Fins-de-Siecle." Low Rotunda, Columbia University. 13 April 1998.
Liberal arts colleges, the clearest example of a teleological educational philosophy in practice, have not ceased to exist. However, while in the past, they were the only schools offering a college degree, they now represent only a small fraction of all schools. Community colleges and vocational education programs have proliferated in this century and show no signs of slowing. Professional schools, community colleges and research universities have tended to specialize in their missions and promise to educate for the acquisition of skills in a way that liberal colleges have not. Though many of these new schools attempted to educate towards a telos that furthers their mission, schools existing as alternatives to liberal arts colleges have tended to prioritize education for skills acquisition and have made the functioning within a particular community the pervasive goal.

The public ought to have a number of choices in their education. It is important that we constantly evaluate not only individual schools ability to

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34 For example, a research university educates for the acquisition of good research skills as well as the values of an ethical, productive research community. The research university is one of the most complicated educational institutions in its mission. In using the categories "instrumental" and "teleological" as meaningful categories, I do place the research university in the camp of the "instrumental". Its German university origins and the activities of humanists at research universities in many ways runs counter to this categorization. However, the case that I make relies on the trajectory that research universities are taking in aligning more frequently with industry peers and in response to specific government requests. I do not mean to conflate the exploratory research and cultivation of scholars at the research university by this categorization. Rather, I hope to highlight the real dangers posed to the research university.
achieve their philosophical ideals in practice, but that we assess our schools' philosophical (and practical) trends in the context of our social aims. Specifically, the fact that our higher education options overwhelmingly are instrumental should itself give us cause to reflect on the danger of such a trajectory. In and of itself instrumentalism is not deleterious. But because even liberal arts or teleologically minded institutions are now incorporating radically instrumentalist methods, facilitated by the new technologies, the social risks of eroding teleological institutions and teleological practices must be examined. By ascribing to an exclusively instrumental philosophy of education, we risk sacrificing all the progress we have made in actualizing an education for participation in and advancement of democracy. With democracy as a social ideal, educational practice must necessarily be value-laden and, therefore, teleological.

In addition, because our public schools and K-12 in general have tended to structure themselves in response to the higher education path that their students will be most likely to take, civic responsibility demands us to take higher education trends seriously. Historically, K-12 institutions have adopted a reactive approach to curricular reform. Specifically, the curriculum offered by the institutions to which K-12 institutions aim to send their graduates largely determines K-12 curriculum. In cases where most students are not expected to go on to higher education, the school curriculum becomes more skills based and the school to work concern becomes the priority. Given
what we know about the ideal expectations of public schooling for
preparation for participation and development of a democratic polity, this is
absurd. Nevertheless many educators hold the opinion that a more pragmatic
attitude towards schooling is an inevitable consequence of a more
technologically informed society, and that because an aptitude for a variety of
skills is a prerequisite for social participation, our schools' primary role must
become technical training.

The new technologies differ from older industrial technologies
precisely in that the new technologies are largely transparent technologies
and are most valuable for having extended human capacities for knowledge
acquisition, distribution, and management. In contrast, previous
technologies were primarily extensions of physical functioning. It is this
character of digital technologies, their propensity for handling information,
that makes reforms deviating from a general education model most difficult
to accept. Previously, the prospect of providing a general education to the
general public was largely an ideal because we lacked the tools necessary for
making information consumption, production, and distribution by free and
intelligent human beings the central activity of the schooling process.

35 Thomas A. Stewart, Intellectual Capital: The New Wealth of Organizations

36 1) I use these economic terms as tools for understanding our educational
system with no expectation that the system itself should be reduced to the
sum of its parts; moreover 2) I am not here stressing the value component of
As our system of education changes, we will have to decide whether it is any longer feasible to expect this system to educate for its original purpose: to prepare youth for participation in democracy. If we concur with Levine that the supermarket should be our ideal, we must evaluate the consequences of this ideal on our democratic goals and our pursuit of a general education for all students. Rather than directing our efforts more aggressively towards achieving general education opportunities for all when for the first time they are seemingly possible, we seem to have largely abandoned our political goals of education and replaced them with technical ends. The consequences of abandoning our general education mission extend well beyond individual institutions; such a trajectory is clearly in tension with democracy.


Chapter II

ASSESSING EDUCATIONAL ALTERNATIVES IN THE MIDST OF THE DIGITAL OPPORTUNITIES: WHY, HOW, AND AT WHAT COST INSTRUMENTALISM IS OVERRIDING TELEOLOGY

Diversity of opinion within the framework of loyalty to our free society is not only basic to a university but to the entire nation.

James B. Conant, *Education in a Divided World*, 1948

If the human race wants to go to hell in a hand basket, technology can help it get there by jet. It won't change the desire or the direction, but it can greatly speed the passage.

Charles M. Allen, speech, *Wake Forest University*, April 25, 1967

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All Institutions Propound a Philosophy

All educational practices imply or perpetuate an educational philosophy such as culture that schools develop in response to particular missions that define their philosophy of practice. For example, constructivist learning strengthens the institutional commitment to and practice of the ideal of constructivism and, similarly, schools' explicit missions to it. These ideals have implications for all aspects of the educational environment. For example, an ideal which values inquiry-driven learning and recommends that students' interests and inquiries direct the learning process will likely be
situated in a school where teachers rely upon indirect instructional approaches instead of sermonic ones. Schools, like businesses and every organization that attempts to unify individuals with an institutional mission, necessarily propound (implicitly or explicitly) a philosophy. The philosophies may vary from school to school, but it is clear that to understand and to change school practice we must also understand the philosophy of education of the institution itself.

In the Introduction, I mentioned the educational philosophies of education of Plato, Rousseau and Dewey. Theirs, of course, are not the only educational philosophies but they are considered to be particularly important in both philosophical and educational arenas. These educational philosophies have five major elements in common. The most important and constitutive element that they share is that they are all teleological. Their commitment to a telos[^39] that includes individual freedom, social responsibility and justice entails other attributes: a transformative purpose, a discursive and participatory method, a student-centered pedagogy, and a civic end. Not all teleological philosophies entail these subsidiary attributes. However, because Plato, Rousseau and Dewey ascribe to a teleology that integrates the individual and society, strives for justice and the cultivation of it in its

[^39]: This term can (and unfortunately has come to) connote a specifically religious purpose. In another sense, and no less correct, telos implies only "a purpose". In this case it is an overarching, non-transmutable telos/purpose.
individuals through education, these attributes are consequentially necessary. The underlying expectation in all three is that the education process is a necessary part of the preparation of youth for both active citizenship/citizenry as well as optimal individual happiness.40

Teleological Educational Philosophies: Liberal Arts Colleges and Public Education

As early as the 17th century, liberal arts colleges, the first institutions of formal higher education in this country, adopted teleological educational philosophies like those of Plato, Rousseau and Dewey, and aimed to cultivate in their primarily white, male student body a capacity to govern themselves with reason and justice. In retrospect, these early schools are, best understood as places where the socialization41 necessary for leadership and exemplary citizenship took place.42


41 See Oscar Handlin and Mary Handlin, The American College and American Culture: Socialization as a Function of Higher Education (The Carnegie Commission, 1970) for a fuller examination of the role of colleges as socialization machines.

The teleological philosophy of education also seems to underlie the aims connoted by a general education\textsuperscript{43}, the mission inherited, though arguably not enacted, by public schools that attempt to educate for reflective and active citizenry.\textsuperscript{44} The general hope is that, upon graduation from these schools, students will be fit to function critically and productively within society having acquired no specific professional skills, only the general skills necessary for citizenry. Of course, this began to change with the development of vocational education programs, which propound a different philosophy of education. Historically, teleological educational philosophies have dominated elite institutions and have greatly informed the conceptualization and development of our educational systems. Teleological systems are rarely cost-efficient. The student-centered methodology requires a manageable student-teacher ratio and places high intellectual and methodological demands on the teacher. However, for centuries only a small percentage of the population was expected or encouraged to receive such schooling, so the institutional demands of a mass teleological education did not deter institutions from offering this student-centered, costly and purpose-driven educational experience systemically.

\textsuperscript{43} Harvard Committee. \textit{General Education In A Free Society} (Harvard University Press, 1945) 57-58.

Teleological institutions adhere to values whose purpose is often vague and idealistic, hence, their effectiveness is difficult to quantifiably assess. The most obvious dangers of this fact are the failure to identify the general competencies required for mastery in a given field, with the result that criteria for proficiency become subject to the whim of individual instructors, and the lack of any standard by which to judge instructors' competency. Thus, out of a desire to quantify, to objectify, to make more accessible, the value of a course, a point system was developed. The term "course" itself is a quantification or objectification of the study process. As part of the systematization of education, the "Carnegie unit" or credit hour, was implemented as early as the 1900's as a means to measure the "amount of learning" a student received, underwent, or accumulated. A special committee convened in order to determine the amount of hours necessary, to constitute how many hours ought to be devoted to particular disciplines and how many hours of study were equal to a point of course work. These unit markers originally functioned to provide a standard of measurement for the work done in secondary schools that could be used by colleges to evaluate a


student - giving a uniform amount of credit for each unit completed.\textsuperscript{47} A standard unit was equal to the amount of "seat time" required to satisfy a particular study. Every student and every course was subject to the unit measurement, which was based upon an educational system defined by location, access to resources, and the textbook.

Some Challenges in the Implementation of Teleological Philosophies

The point system developed because, while a teleological educational philosophy propounds general values, to function as an organization, it requires rules of conduct and methods of evaluation. The demand for a quantitative means of analysis (review and assessment) became greater, particularly in this century, as the school system became more equitable, i.e., accessible to the general public. The mass public nature made the qualitative assessment of the institutional procedures impractical and costly. The point system is a highly reductionistic and quantitative instrument, as are most methods of organizing and assessing large systems. So, on the one hand, philosophies of education (teleological) have general ideals as their aims. On

\textsuperscript{47} Design and Communication in Modern Culture*: Standardization of Disciplines, Graduation Requirements, and College Admission Standards: The Carnegie Unit, ed. Barbara Torney, Terrell Marks and Akbar Ali, Teachers College, Columbia University, 23 July 1999
the other hand, they have highly analytic and reductionistic instruments for assessing their effectiveness at cultivating students' capacities.

There is a second inherent problem in the implementation of a teleological philosophy in an education institution. The telos is the umbrella principle/mission that informs all action within the institution. Insofar as the general principle is democratic, it must both cultivate an appreciation for social justice and tolerance as well as individual freedom. On the one hand, democracy inhibits spontaneous change. On the other, it allows flexibility in catering to unpredictable human interests. Interest groups, political parties and educational philosophers have tended throughout history to align themselves either on the left or the right, therefore committing themselves to propound either personal freedom or moral character, as if they were mutually exclusive values. In political situations, the polarities are expected, and the ideological differences genuine. Parties compete to dominate policy discussions. Though their agendas are usually very different, the left and the right remain consistently in dialogue with one another because policy decisions require it, and usually reach a compromise-conclusion. Conflict arises, however, because the ideals of democracy include immutable virtues like justice that are seen as essential to every individual's humanity, and personal freedom, which is crucial to the nature and development of humanity. The former requires directing or educating individuals to the overarching ideals of the system; the latter requires that the system be
encouraging, respectful and tolerant of individual preferences.\textsuperscript{48} Each is necessarily tied to the concept and practice of democracy, which must constantly balance the social and the individual without compromising either.\textsuperscript{49}

In his \textit{Ethics} (1908), Dewey describes the way in which opportunities for freedom and responsibility have increased over time in our striving for democracy,

\textit{Initiative and Responsibility}.—Moreover, the general policy of turning over to individuals the power and responsibility to regulate their own acts, is in accord with one great feature of moral development. The evolution of moral personality, as traced in our early chapters, shows the individual at first living as a member of a kinship group which determines his economic as well as his religious and social life, and permits him neither to strike out independently, nor, on the other hand, to suffer want so long as the group has supplies. Individual initiative and responsibility have steadily increased, and the economic development has undoubtedly strengthened the development of religious, political, and moral freedom. It is the combination of these which gives the person of today the worth and dignity belonging to autonomy, self-government, and democracy.

It is arguably apparent how individuals’ freedom has increased over the centuries. However, it is less clear that justice has similarly increased, or that

\textsuperscript{48} It must be noted, however, that all concrete reality has implications for the democratic freedom of humanity. That is, it is a fact that “space” (as well as time) has real implications for the ideas and alternatives of a culture. See Stephen Kern’s book, \textit{The Culture of Time and Space 1880-1918} (Harvard University Press, 1983) to expand and illustrate this concept.

we have remained committed to a particular kind of justice given our focus on individual rights and personal freedom. Not surprisingly, as individual and interest groups claim rights to varieties of freedom, however a general commitment to a common vision of justice becomes increasingly qualified and less certain. Dewey's point is that the role each individual is allowed to play in self-governance has increased. To the degree that men and women of all races can become citizens and vote, increasing democratization cannot be disputed. In a school setting, however, where the mission has been for the cultivation of the general capacities required of active and responsible citizenry, it is not so clear that across the board, we have similarly evolved in producing an increasingly just and free experience.

The Gap Between General Education and Skills Education

As new educational institutions developed, they did so in something of an ad hoc manner like cities do—according to market needs and individual interests. Most institutions of higher education developed as either liberal or vocational institutions, educating for thinking or doing. The former aimed to educate primarily for intellectual proficiency (teleological), the latter for labor or technical skills. The polarization of intellectual versus skillful still resides with us in the form of stereotypes and institutional missions-the liberal arts

college versus the community college, and professional schools, comprehensive colleges, research universities position themselves along this continuum as well. The parallel development and contrasting missions of the teleological (liberal arts college tradition) on the one hand and the vocational or skills-based on the other has served and been propelled by our national interests for centuries. The considerably smaller proportion of individuals receiving an elite or liberal education in contrast to the number of labor or profession specific degrees has been the direct result of market needs, societal organization (economic capacities) and individual interests. As the technologies of labor-intensive pursuits became more complicated in increasingly complex societies, casual apprenticeships could no longer meet the needs of the masses who would engage in these pursuits. Schools, in the form of professional, certificate and degree programs, grew to meet the needs of those who chose to be educated for specific skills and goals, not "general knowledge".52

51 Admittedly research universities are more difficult to categorize than other institutes of higher education. Their heritage lies in the German tradition of "knowledge for knowledge sake" which rings more true of a teleological philosophy (See Charles Franklin Thwing, The American and the German University: One Hundred Years of History [The Macmillan Co., New York, 1928]). However, as the role of the research university has become more one of an incubator for increasingly applied knowledge, its commitment seems to be that of a highly pragmatic, and instrumental one.

52 Richard Hofstadter and C. DeWitt Hardy, The Development and Scope of Higher Education in the United States (Columbia University Press, 1952) 175-
Instrumentalist Philosophies of Education

The numbers and kinds of these programs proliferated with such speed that they have for decades outnumbered traditional liberal arts colleges. This method of educating for a particular end (in a teleological or general education, the ends are general), and according to student or market interests, implies a philosophy in contrast to the teleological. Whereas the teleological philosophies of education aim towards achieving an educational ideal, this educational philosophy has a more individualistic and empirical motive. This contrasting philosophy of education will henceforth be referred to as an "instrumental" philosophy of education or "instrumentalism".

Pragmatists coined the terms "instrumental" and "instrumentalism" in the early twentieth century, referring to the act of ascribing value to a thing (idea or object) by its function. "According to pragmatism, the test of the truth of a proposition is its practical utility; the purpose of thought is to guide

179. A number of other good sources could be referenced here. My own personal slant is towards the interpretation of vocationally oriented or utility schools as a response to emerging needs in society for skilled labor (intellectual and manual) as a consequence of technological innovation. Consequently, I would recommend Richard R. Nelson's Understanding Technical Change as an Evolutionary Process (New York: Elsevier Science Pub. Co., 1987) and Lawrence Veysey's, The Emergence of the American University (Chicago University Press, 1965) for fuller explanation and history.
action; and the effect of an idea is more important than its origin. As a concept, however, instrumentalism has existed at least as early as Plato’s Republic where, for example, justice is hypothetically defined by Thrasyvachus as the “process of doing good to one’s friends and harm to one’s enemies”. As such, the value or justness of an act would be determined not by eternal, absolute or objective criteria, but by individual interests or subjective criteria. Plato rejects this definition in The Republic (and other dialogues) because it inevitably leads to extreme relativism by relying upon a subjective and transient measure. Rather, Plato believed, and tried to logically demonstrate, that objectivity is nullified by such instrumentalist measures. Justice, of course, was only one of the many concepts that require objective definition in the strategic formation of good societies according to Plato. This discussion of justice, however, as a relative (according to personal utility) concept in Plato’s Republic shows how instrumentalism has a long-standing tradition and has been contrasted with the teleological. For Plato, the distinction resides in that instrumentalism implies from its beginnings that concepts acquire meaning by subjective or empirical criteria, whereas teleology implies transcendental, objective or conceptual criteria.


For many people, including some well-respected philosophers such as Richard Rorty, this concept of socially-constructed meaning is applicable not only to educational practice, but to all ways of life.\textsuperscript{55} To them, it is essential to democracy. This understanding of democracy, one that prioritizes personal freedom over the obligation to do anything other than what one wishes, is both popular and has contributed to the greatness of this country. It is a definition, however, that fails to adequately address the fact that the constitutive ideals of liberal democracy are, in fact, unchanging, and valuable because they are not subject to cancellation by vote. Even the values that underlie Rorty's conception of democracy—personal freedom and individual autonomy—assume stability beyond individual desire and are at the basis of his philosophy of meaning. If personal freedom is taken to an extreme, the argument goes, it could vote itself out of existence.\textsuperscript{56} That is neither a risk taken nor a belief held by those committed to a democracy constituted by inalienable rights.

Personal freedom, justice, and autonomy are meaningful regardless of whether or not the majority believes them to be. As a founding member of the


United Nations, the United States exhibits a commitment to essential human ideals, like justice, when it confronts injustices such as the mutilation of women in South Africa, hoping to persuade if not by reason then by force, of the rightness of the ideal. The majority of Americans may or may not agree with this commitment to the rights of individuals to a free and humane way of life, but the philosophical commitment to these ideals overrides the need for consensus. This is, of course, representative of our national belief that ideals have genuine import for humanity and that consensus and individual will are not sufficient means to direct social and human action. Of course, the meaning of the ideals, and, in particular, democratic ideals, has never been transparent in action. Which particular injustices or apparent injustices constitute a conflict with an ideal are always issues for debate. Politicians debate the meaning of democracy in legislation as well as through publicly articulated stances. Citizens debate the meaning of democracy in personal legislation and by voting. Educators debate the meaning of democracy in classrooms as well as by the formation of the institutions that subscribe to particular missions. Sometimes the debates and reflection occur only after radical changes have reformed educational institutions or systems. This plea to reflect on the philosophical underpinnings of our education institutions comes at a time when massive changes are happening in our schools and in society.
The Transformation of Society and the Response of Educational Institutions

Specifically, we are currently witnessing a transformation in our market needs and societal organization. Manufacturing plants, once a primary job supplier and economic staple in the US, have moved abroad. New media and digital communications are rapidly taking over our market.57 More jobs exist in new media than there are people to fill them. Educational institutions have begun to respond to market and student body needs by developing programs - across disciplines - to train for basic knowledge and adeptness with new tools such as the Web and word processing, as well as by developing programs specializing in information technology. The new technologies have become so ubiquitous that most students expect to receive basic access to and training in (when necessary) the Web, word processing and html publishing. These skills are becoming as familiar and essential as pen and paper have been for centuries and education for them is more akin to learning to write cursive than learning to think.

The fast pace of technological innovation and reform activities and the technical nature of the reform tools themselves are blurring the once apparent contrast between a liberal arts and vocational education. Liberal arts teaching is generally expected to involve lots of small group discussion, opportunities

for individual expression, and a focus on history and classics. Digital technologies pose a real challenge to liberal teaching and study. Distance education is incredibly efficient, and adeptness with the Web and word processing seems to be more important to students than a knowledge of Plato. On the cusp of radical reform, we need to ask ourselves, *What is the meaning of a liberal arts education and its teleological philosophy, in a digital environment?* As schools and educational communities transform themselves in response to current developments vis-a-vis the World Wide Web, new media and digital innovations, institutional strategies based on different educational philosophies will emerge and compete with one another. The educational philosophy coming to the fore in the midst of digital reform is not teleological or liberal. It is radically instrumental. We need to assess the costs and the value of such a transformation. Before we consider the potential costs of digital technologies for education, at the risk of pushing aside the teleological, we need to look to both history and philosophy to understand how we have arrived at this present situation and to assess where we ought to direct reforms.

Over the years, education has become increasingly accessible to all members of society. Accreditation, certification or college degree is within the reach of nearly everyone. Degree programs exist for nearly any interest imaginable. Many of these programs are publicly supported financially and through open admissions. This increasing accessibility to education is quickly
changing the face of higher education. Whereas formal degrees were once considered to be the privilege of the few and the white and the male, necessary for their socialization into political or leadership roles, all members of society can now obtain college and graduate degrees. Education has become radically democratic.

The increasing accessibility of education and the multiplication of kinds of degrees available must be seen as a response to developing societal needs. Industry developed with such complexity and rapidity that an education or training of some kind was required for most jobs. Reading and writing with proficiency was no longer a sufficient end of the educational process. Specialization propelled the focus on discipline-based technical and intellectual expertise. By the mid 1800's, education as a means to socialization began to take a back seat to specialization and skills acquisition. In some ways, the radical democratization through increased access and expansion of programs is responsible for the current adoption of an instrumental educational philosophy over the teleological.

As an educational philosophy, instrumentalism implies, among other things, that the meaning of education is determined by consensus or some other culmination of individual wills. Like other ideas, concepts and

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philosophies, instrumentalism informs practice by informing institutional strategies and the way in which roles are defined. As a philosophy that guides educational practice, instrumentalism has implications for the institution, the individual members of education institutions, i.e., teachers, students and administrators, and the methodologies used to meet educational ends. In an educational setting, instrumentalism also has implications for the way programs are structured and reform occurs, i.e., generated out of requests by the student-consumer body, but also for the way education is "delivered". Further, such an educational system, responding as it does to student demands, requires that the teacher be a value- free educator whose main role is service provider. Teachers deliver the information, knowledge, or services that students request.

The general culture and goals of educational institutions that employ an instrumental ideal are subject to the pressure of its constituent members--students, faculty, and administration. Individual and group interests drive instrumental education systems. In addition, this culture, unlike a teleological system, is not an overarching value system that informs all educational activities, but merely indicates the general functions and strategies of the institution. Knowledge production and transfer are still very

59 Agricultural schools developed out of farmers' needs to get trained with new equipment. The Teaching Company, a distributor of audio and video tapes on all subjects, developed out of a market interest. Distance education programs are the response to students' pleas for efficiency and convenience.
much a part of instrumental systems. Yet, concepts like justice and virtue have no role to play within instrumental systems, except, of course, when they are deemed by constituents to be an important part of the educational process. However, the meaning of justice then takes on a constructed significance determined by the institutional members and does not refer to or take meaning from an objective concept or form.\footnote{This was Thrasymachus' point.}

One consequence of an instrumentalist philosophy of education is that students take on a more proactive role. Thus, student participation in education has become more democratic. Student interests drive not only the kinds of content (in courses and degrees options), but also the types of learning activities that occur. In so doing, students have turned the tables somewhat on educators who had previously been solely responsible for designing courses and programs. Institutional program administrators and educators - across the board - respond to student requests for more efficient servicing. We also see this happening in liberal arts colleges who now meet demands for distance education and increased vocational training in technical skills like Word Processing and Web navigation. As such, students are effectively eroding the practice of a teleological education philosophy and converting it to an instrumental one.
As institutions begin to take direction from students in defining educational experiences, teachers' roles in the educational process are also being radically redefined. The very fact that students living on-campus often constitute the greatest number of students taking distance education courses, seems to suggest as well that students are not particularly concerned about maintaining a substantive and personal relationship with their teachers. As such, information and content have become the focus of study, as opposed to the cultivation of individual excellence and capacities for managing and integrating content to make sound or reasonable judgments. To a significant degree, the increasing complexity of society has propelled the development of instrumentalist education institutions in the form of science and technology programs, whether engineering, certification or training programs. Thus, the advent of digital technologies and the World Wide Web—in their ubiquity—have facilitated (some say propelled) the development of a radically instrumentalist (consumer-driven) approach to education in all arenas, including the liberal arts colleges. To many, this is causing a major crisis in education.

These tools have also now become the means by which institutions are restructuring themselves. Radical reform opportunities have recently opened up to all educational institutions with the advent of the World Wide Web,
wide area networks (WANs), and new media. As the most influential and recent technology to radically reform educational practice, the printing press contributed to the democratization of education by affording the efficient transfer, production and consumption of information. Currently, digital technologies one-up the printing press's capacities for educational reform by altering not only the means of information economics but also their institutional organization and method. "Schools" no longer have to occupy geographical spaces in a digital culture and teachers no longer have to be physically present to communicate with their students. Thus, in higher education, distance education initiatives, which have thus far proven to diminish the student-teacher relationship, are dominating all reform efforts. However, there is nothing inherent in this technology that rules out a teleological approach. But the trend has become radically instrumental as student-consumer interests drive educational reform and pedagogical focus.

61 The range of sources on this issue is varied. The Web is perhaps the most current and prolific on this subject of specific institutional change in the current climate. The Fall 1997 issue of Daedalus was devoted entirely to the changing academic community, with a special focus on technology. See Martin Trow, "The Development of Information Technology in American Higher Education", Daedalus. Journal of the American Academy of Arts and Sciences (Vol 126, No 4, Fall 1997) for more explication on this subject.

Ideologically and historically, individualism and concern for freedom have played major roles in propelling instrumentalist thinking in education. These conceptual and historical factors, however, have been either activated or allowed by the technologies of independent, rational thinking and self-sufficient labor, to an important degree. We have afforded greater control over ourselves by inventing and innovating on technologies like the clock and the word processor. We have also diminished the influence that an overarching telos—including a democratic one—has on our selves, and consequently our schools. As such, the interest in developing teleological educational institutions has waned. To be sure, the nature of teleological philosophies and systems is such that they are top-down systems—the ideals or telos serve as the goal towards which all members aim toward. This can be especially oppressive to individuals concerned with their right to choose the programs they desire, the way they are delivered, and the meaning of these programs, i.e., accreditation or socialization or a “what-I-want” versus “what-you-tell-me-I-need”. Hence, the move towards an instrumental system of education has served our interest in freedom and autonomy.

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Instrumental Systems and the Student-Teacher Role

Instrumental systems are not entirely uneducative in a qualitative or liberal sense, nor are they relegated to purely business or technical fields. A Literature class on James Joyce might be constructed with an instrumental ideal in view: students identify what they want to get in terms of content out of a class, and the instructor then teaches to that request. An instrumental and a teleological class may look quite similar. The subtle differences, however, are that the agenda is set by the students (or market) in an instrumental system, usurping the control of the teacher, and the teacher is radically defined by the content or student objective. “Instrumental” educational systems connote a focus on information delivery and “teleological” connotes a goal of human understanding or purpose. These distinctions affect not only how the teacher teaches, but also what students expect of him or her.

Students could expect to glean a substantial amount of information on Joyce and his works from an instrumentally-informed class. Even though the goal is information delivery, expert instruction can be essential. The pedagogical role, however, is content-centered as opposed to student-centered in the transformative sense. This instrumental approach is one that differs radically from an educational process that attempts to use a study of Joyce to transform a student into a reflective thinker capable of making justified interpretations of Joyce.
In general, students learn indirectly what ideals like freedom of expression and responsible citizenry mean by participating in educational activities with other students, learning to research, and communicating persuasively in writing and speech. Teaching to these ideals requires assessing in probabilistic ways how and if students achieve in their learning. In an effort to improve educational effectiveness, develop standards of excellence and to disseminate particularly successful ways of educating for systemic ideals, standards and guides for action have been adopted by most educational institutions. There are federal and state guidelines for most public institutions. Private institutions have their own methods of passing on traditions of practice. The problem all institutions face in attempting to systematize procedures - excellent as they may be - is that once documents and tradition begin to drive practice, instead of conceptual ideals, rigidity in practice takes root and quality of service/experience suffers.

The specific practices in teaching, research, and institutional organization ultimately reflect the ideals and telos of teleologically informed educational institutions. Time, standardization, and the difficulty of translating ideals into practice tend to muddy the relationship between institutional ideals and tradition. The ideals and telos of an institution are general and conceptual, but as guides for practice and ways of thinking, they take on specificity upon implementation. This specificity advances ideals, however, only insofar as the individual actors, teachers and students,
comprehend the ideals informing practice. Change within teleological systems is often strained for these reasons: 1) tradition is difficult to change, 2) standards are the basis of bureaucracy, and 3) direct correspondence of ideal into practice is often hazy. These are merely a few of the reasons why the adoption of a teleological system of education is problematic.

Change and flexibility are essential to the concept and practice of democracy because the real will never correspond exactly, in any instance, to the ideal. There must always be opportunity to alter educational practice to better represent ideals. Practice itself is always specific to historical constraints. In order to optimize the opportunities for the development of practice and methods that improve upon existing ones, opportunities for change and reform need to be secured in every system, including the educational, if it is conceptually democratic or is based upon any ideals. But as teleological systems are usually top-down, they tend to frustrate the development of alternative practice. This is detrimental to democratic society in its attempt to actualize the ideal in real practice. It is even more detrimental to the honesty, communication and tolerance in democratic educational institutions where the cultivation of free expression in individuals is essential but potentially stifled by routinization and systematization of practice.

Conceptually, individualism is the means by which oppressive or stifling systems are held in check. Individuals, acting on marginalized or oppressed interests, have reformed institutions and governments throughout
history. Our own democratic country was founded on the acts and ideals of some individuals who were dissatisfied, oppressed and stifled by the ideals and imperialistic practices of their British motherland. To our advantage, with forethought and these democratic ideals in view when constructing our own government, checks and balances were created within the governmental system to prevent a single institution or entity from garnering too much political power. Freedom of expression, as one of the many individual freedoms inherent to our concept of citizenry, affords the individual opportunities to audit the system.

The Polarization of Philosophies of Education and Its Problems for Democracy

In educational situations, where the primary purpose is to educate students for the reflective and capable participation in a democracy, exclusive polarities between teleological and instrumental or liberal and vocational are deficient. Youth need to be educated both for the understanding of unchanging, democratic ideals, as well as for the practice of personal freedom. The system aiming to cultivate a particular kind of citizen, i.e., reflective, rational, and active, must also (in addition to checks and balances) create opportunities for reform within the system. Educational practice needs to be both teleological for values and instrumental for freedom to cultivate an
understanding of and capacity for practice of democracy in its citizen youth. Insofar as many educational programs in higher education attempt to prepare students for responsible and capable participation in discursive communities like democracy, they also require that students both understand the ideals of the group and contribute to its growth through creative and interest-driven initiatives. Much of higher education must also be both teleological and instrumental in its mission and practice in order to achieve these democratic ends.

Educational institutions have had more difficulty than government in allowing individual actors to affect the system. Most schools look and proceed much like all other schools, and none have radically changed for over four hundred years.64 There is no single, leading educational institution in the same way that there is a federal government that has authority over its state constituents. The Department of Education has little or no authority over school administration or procedure. There are organizations like the American Federation of Teachers that could conceivably have conceptual

64 Many would argue that the Montessorian or the Waldorf schools, for example, offer radically different alternatives to the mainstream models of schooling. I would argue, however, that 1) all alternative models have remained marginal and 2) the essential structure of education which relies upon a single instructor with a group of students with books in a classroom has remained constant for the past four hundred years—essentially, since the invention of the printing press. See Textbooks and Schooling in the United States (edited by David L. Elliott and Arthur Woodward, 1990) for further explanation.
influence over educational practice and innovation, but this group has, instead, organized itself as a labor union that worries more about health benefits of its members than educational practice or ideology. 65

In addition, the concept of a public system of education itself is still a fairly new concept, only a hundred years old or so; hence, the effects of radical democratization on the system have yet to work themselves out. Perhaps more important, however, is the fact that educational institutions are comprised of individuals, citizens-in-training, whom the system assumes are immature. The primary constituents of a school, the students, assume tutelage roles and are not afforded “voting privileges” of the kind that are granted to individual citizens. Consequently, the system has not created the opportunities for individual acts of reform or change like the government or other institutions have.

In many ways, the development of specialized educational institutions and disciplines has been the expression of individual aspirations. Agricultural, research, and vocational institutions developed in response to inadequacies in the existing system. Insofar as the institutions are radically instrumental and fail to educate for democratic ideals, they need to do so

more effectively and adopt teleological methods if we want to educate for
responsible citizenry and believe that democracy is more substantive in
meaning than the sum of all citizens' desires. Insofar as the technologies are
the primary means by which ideals are propelled or actualized in practice, we
need, for the sake of democracy, to take a look at the impact of digital
technologies on education and the possibility that they may

1) Diminish any role that a democratic "telos" has on education
   practice. And

2) Replace polarized ways of thinking about education (instrumental
   or teleological) with something more productive, both just and free.

Technologies and the Causal Explanation of Instrumentalism

Many critics of the new technologies blame the technologies
themselves for the new and impoverished trends in education practice which
rely upon convenience and efficient service as the qualities guiding present-
day reform.66 These critics like David Noble of York University are right in
their association of new media with the radical vocationalization of

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education.\textsuperscript{67} But they are incorrect in suggesting that the new technologies initiated this way of thinking about education, that it is merely a process of delivering information or skills by delivering information to students. Vocational education, itself, is something that is better understood with its philosophical underpinnings made explicit.

Agricultural schools were created in response to the increasing complexity of farming. Community colleges were developed in the latter part of this century to respond to the need for skilled workers. In a chicken and egg fashion, new skills based programs were developed to meet the needs of students who hoped that the training would help them find employment. New skills are required in the inevitably changing workplace and old employees then require new training. What skills based training does is provide the education for a particular kind of work. Because of technological change, the skills required for jobs are always changing. The programs of technical or vocational education have consistently changed over time according to the social demands and individual interests. However, the

\footnotesize{\textsuperscript{67} David F. Noble is professor of history at York University in Toronto, though he's currently the Hixon/Riggs Visiting Professor at Harvey Mudd College in Claremont, California. He has also taught at the Massachusetts Institute of Technology and Drexel University, and was a curator of modern technology at the Smithsonian Institution. His previous books include America by Design: Science, Technology, and the Rise of Corporate Capitalism and Forces of Production: A Social History of Industrial Automation. <http://www.omnimag.com/archives/chats/bios/noble.html>
instrumentalist method or philosophy of providing students with specific programs to meet their specific requests and market needs, is consistent throughout.

Previously, a four-year residence on a comprehensive campus typified the college experience. The campus was the location for classes, student housing, research buildings and special interest groups--an incubator for a young adult's intellectual and social development. Many people are now postponing college and higher education, both graduate and undergraduate, until after they begin careers and families. The time and life commitments required for a campus-centered education are greater than most adults with a career and family can make. In addition, education is increasingly becoming the means by which career shifts are made. For these reasons, the population of eighteen to twenty-two year old college students, who were able to make substantial time and living commitments to a single campus, is less accurately representing the student body in higher education. Adults age 24 and older now comprise 45 per cent of the higher education student population including both undergraduate and graduate population. The numbers are steadily increasing, and will continue to do so as long as programs of study are created which meet their specific needs. "I want terrific service, I want
convenience, I want quality control," typifies their spirit and it is to this spirit that higher education administrators and reformers submit in their institutional design.

The emerging student average in higher education is a working adult (over twenty-four years old) with family commitments. This group cannot and will not radically alter its life to make adjustments for its education. Indeed 18 to 22 year olds who live on campus are opting to take distance education courses from the very campus on which they reside, even when the same courses are offered on campus. Convenience is the driving force defining these students' choices. The construction and reorganization of educational programs and institutions have never before been so intense. The number of new educational programs is staggering, and the transformations are in many cases radical. New media are propelling most instances of growth and change. The new programs either focus on training for the use of new media or take advantage of new media in making programs more convenient or efficient for the consumer-student. President Clinton has declared technological development as one of the most important issues in education, promising that it is vital to improving our public schools as it

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69 As yet, new media is an undefined term, but is meant to reference the internet, the World Wide Web, streaming capacities, bandwidth, et al.
makes quality resources accessible by the Web. This, in turn, is expected to improve the competencies of both teachers and students and our international rank.

The consequence, however, of such radically efficient service is that both higher education and pre-college institutions tend now enthusiastically towards instrumentalist practice—giving students what they want and need efficiently, and preparing them for working productively for particular employment positions. The capacity of information technologies to transfer information, the staple of education, more efficiently and with greater individuation can lead to even greater market-driven fragmentation. Digital technologies like the World Wide Web and Internet videoconferencing tools make learning more efficient and can lend greater control to students. Ironically, the radical specialization and aggregation of information content made possible by the Web and wide area networks impels us to educate for students who can integrate diverse and multiple information sources and communicate their significance broadly.

The ease by which people are brought together, so to speak, on the Web in a "virtual" space has prompted many schools to contract out teaching assignments to people who have had no previous affiliation with the education provider. This student-directed, content-focused educational instrumentalism has prompted an understanding of teaching that does not
require a consideration of school culture or values—only information delivery. Some institutions, The Western Governors University, for example, are entirely comprised of distant affiliates: "WGU doesn’t offer instruction itself. Rather we broker instruction provided by our affiliate colleges, universities and corporations." They have no core group of professors or instructors, only virtually affiliated members. An institutional and pedagogical telos is absent from these distance initiatives. Consequently, the values towards which students are educated are entirely subject to the discretion of individual instructors, if attended to at all. Of course, simply because these educators are linked by virtual space does not preclude them from being teleological. However, the fragmentation of the educational institution focused emphatically on student interests and impelled by an instrumentalist ideology has effected two things, which are problematic to a teleological educational mission. First, teachers are diverted from educating towards particular values because of their focus on particular student interests and content; and second, if the odd teacher is teleological in practice, he or she is not supported by the institution.

The reductionism of the educational institution to the sum of its instructors is also being extended to the assessment of a course. Teleological

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70Western Governors University: An Education Without Boundaries for a Future Without Limits, 23 July 1999
<http://www.wgu.edu/wgu/about/educators.html>. 

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systems attribute excellence to students on the basis of both their content knowledge and capacity for performing within a group and with peers. The pedaglogue plays an important role in making qualitative judgments about student capacities based on his/her own experience with the students and knowledge of indicators of human intelligence and character. In instrumental systems, where the study is content-centered, student evaluations tend to be significantly more objective. The Western Governors University is one prominent example of a distant education program that has taken that objectivity and reductionism to an extreme. It is a competency-based institution. This means that, lacking a comprehensive educational experience students make progress towards certification and degrees through life experience and exhibiting an understanding of course materials.

"Competencies are nothing more than skills or knowledge identified by professionals in a particular field as being essential for mastery of that field." 71

Recognizing the bureaucratic and reductionistic implications of the point system on education, the Carnegie Foundation attempted to abolish the unit standard, but to no avail.72 There was no alternative available to the point system, and so it has become the primary means of quantifying and


objectifying certification and mastery of study. The competency-based procedures adopted by Western Governors University, for example, are merely logical extensions of this reductionism.

Digital technologies offer educational institutions the unprecedented opportunity to reform with the interests and needs of its student body at the fore, attending vociferously to the democratic requirements of personal freedom. In altering the scale of educational practice heavily towards students' freedom and interest, we simultaneously move away from purposeful educational practice, capable of cultivating integrated citizens with a commitment to and understanding of the ideals of democracy.

Educational administrators have always worried about how to satisfy consumer-student interests and, consequently, developed programs to meet the needs of this emerging student population in the United States. Educational institutions rely upon student consumption for survival, and they are choosing, judiciously, to respond to the student demands. The retail model, based on service and sales, has become the paradigm for education today. Students want convenience, quality control and great service.

Technology per se has become so ubiquitous that adeptness in its basic tools has become necessary to compete for employment, one of the goals of a good general education. Whereas historically, to be competitive in job markets, students needed to be smart and to possess a command of reading,
writing and the ability to express themselves well, the demands now are still
greater. Processing information and communicating that information are still
criteria for assessing intelligence, but the means by which these basic
activities are performed have become more complicated since the
development of word processors, the Internet, graphic design programs, and
e-mail, for example. The tools training that was once a part of vocational
programs exclusively has now become mainstream and is steadily increasing
in the importance it holds for general education: "Today, the emphasis is
increasingly being placed on integrating academic (theoretical) disciplines
with more rigorous vocational (hands-on) courses for all students, but
particularly for the large number of non-college-bound students. In the best
of these programs, traditional academic and vocational offerings are
complementary, with work activities used to help students learn English,
math, and science, for example, while the classroom experience builds on and
reinforces on-the-job learning."73

Why and How Digital Technologies Are Reform Tools

Ironically, digital technologies afford us the opportunity to improve
the means by which education becomes student-centered, thereby granting
much of the control and direction of the student's study to him or her. Insofar

73 Study of School-To-Work Initiatives October 1996, 23 July 1999
as the reform is made with priority given to efficiency, and not sound educational goals, we run the risk of diluting education to a term that means "to lead out of wherever the student-consumer wants to go" instead of "out of ignorance". In addition, digital technologies now afford us the means to construct a learning community consisting not only of peers, but also of pedagogues who can help guide the learning process by creating educational opportunities and nurturing the understanding of essential values. The aim of preparing students for participation in a general democracy or a community of scholars by creating opportunities for transformative experiences, robust discussion amongst their peers and intellectual superiors and engaging study with a student-centered pedagogue is radically improved by the emerging technologies. And yet, this teleological end is being usurped and overshadowed by the enthusiasm for radically efficient educational servicing, thereby undermining the possibilities that digital technologies hold for achieving the educational vision and reform necessary for a participatory democracy.

The marriage of education and technology has never been so important or consciously propelled by so many people. Policy makers have prioritized schools' access to the technological resources they need and have granted schools the right to purchase electronic materials at a discount rate,
an e-rate\textsuperscript{74}, at great expense to industry. Though the government has allotted billions of dollars annually to cover the 20-90 per cent discount on telecommunications development to schools and libraries, industry will have to share in the financial burden of wiring schools and libraries because it is deemed so important by the government.

Many principals view the wiring of their schools as their most important task. Schools are investing large sums of money in newly constructed technology coordinator positions, developing entire technology departments, and acquiring improved computers and technology equipment. Technology coordinators tend to make bigger salaries than teachers since their market demand is greater. Partial T1 lines amount to bills of $800 per month\textsuperscript{75}, and for those schools that invest in full T1 lines—a powerful connection to the Internet, but required for involved and comprehensive use in curricular or study activities—the amount is ten times greater. Annual library budgets are often less than the monthly maintenance cost of Internet

\textsuperscript{74}The Federal Communications Commission (FCC) on, May 8, 1997, released its final order and rules implementing the universal service requirement in Section 254 of the Telecommunications Act of 1996. The FCC adopted rules that reflected virtually all of the recommendations of the Federal-State Joint Board. One of the key provisions of the Act in Section 254 is the discount program for schools and libraries.

\textsuperscript{75}These figures are relative, of course, and are constantly changing. A December 1998 rate looks more like $1,100/month. The exact figures are less important than the fact that the costs are substantial, but viewed essential by many administrators.
access for schools, and this does not include the initial infrastructure
development costs. As daunting as the costs of technological development
are, school officials agree that technology development is a priority in school
reform.

To Plato, Rousseau, and Dewey, the relationship between education
and technology was not explicit. None of these philosophers presumed a
causal relationship between technology and quality education. Upon closer
investigation, however, it is clear that the technologies available during each
philosopher’s time did have an impact on the philosophies of education each
constructed by either constraining or enabling his imagination. These
technologies played a most significant role in delimiting the particular
recommendations for practice and the extent to which their philosophical
ideals were actualized.

Naturally, education per se and educational philosophy are not
identical, but one does imply the other. This technologically-informed and
technologically-propelled era in education is gravitating towards a particular
educational philosophy, instrumentalism. However, there is no necessary or
deterministic relationship between the technology and education. In
following the path of least resistance in response to digital developments,
many technology enthusiasts are passively choosing a particular
instrumentalist philosophy of education. The spatial and temporal
configurations of the traditional campus setting no longer apply because
convenience and efficiency are essential attributes unequivocally associated with the emerging technologies. Instead, we have distance education where a course might exist online along with research and course materials. All are available with the click of a mouse on the Web. Dial-up and remote access to education servers excuse students and instructors from having to travel to libraries or to meet each other in classrooms. The student's control over access to course materials and communication with the instructor and his peers is radically altered by the Web, wide-area networks, and remote access. These are only some of the many emerging technologies available for educational use.

In less vocationally oriented education programs, the tendency towards instrumentalist practice has taken root as well. Increased specialization over the past century has driven the development of concentrations and certificate and degree programs. Students, following the lead of the experts in particular fields, are no longer satisfied with general degrees in literature, but want specialization in English literature of the late eighteenth century, for example. In the sciences, where new discoveries and classification schemes are constantly being made, the trend has been even greater. The result is that general education is no longer desired by many.
What is unusual about the current student-consumer demands\textsuperscript{76} is that they are being made by students at liberal arts institutions as well as more career-oriented schools. And administrators and educators believe they will lose student clients if they do not upgrade educational services to an online or distance education alternative. These demands refer not only to the content of educational programs, e.g., computer programming, but also to the method of educating itself. Students are voicing their rights to pursue an education how, where, and when they want. For example, Oxford University, one of the premier, liberal arts institutions in the world, recently announced its plan to offer distant online courses in both humanistic and technical fields.

Historically, the content of a course or program might change to satisfy students' interests, the methodologies and forms of delivery have remained consistent in education for over four hundred years.\textsuperscript{77} But now students are asking education providers for service and efficiency regardless of the nature of the provider, regardless of the effect the online instruction has on the

\textsuperscript{76} Economists are right to assert that my use of demand in this sense might as easily be explained by a consideration of supply, i.e., that suppliers are choosing to create new markets with new online and distance education services. If it were not for the fact that students who enrolled in particular universities, for example, are also the largest market for their own online courses; and that the number of distance accredited and non-accredited education programs have grown dramatically in the past decade, whereas traditional on campus programs have stabled, I would focus less on the demand side explanation.

classroom, on pedagogy, on the quality of the education experience or the course content.

We must look closer at what changes have already taken place as a result of the technologies and what changes are possible to reform education and redirect the development of our educational institutions. We must do so in order to capitalize on the opportunities that digital technologies offer for realizing our democratic ideals and creating the mechanisms for improving upon the system by creating opportunities for systemic change through individual expression and change, a form of action both afforded and encouraged through instrumentalist practice. We can then practically restructure educational and institutional practice to better actualize these democratic ideals.
Chapter III

IDEAL PHILOSOPHY AND REAL TECHNOLOGY:
AN EXAMINATION OF PLATO, ROUSSEAU AND DEWEY TO
UNDERSTAND THE COMPLEX RELATIONSHIP BETWEEN
PHILOSOPHY AND TECHNOLOGY IN EDUCATIONAL PRACTICE
AND TO RESCUE THE IDEAL OF RESPONSIBLE DEMOCRACY

From the failure of the humanist tradition to participate fully or act
decisively, civilizations may perhaps crumble or perish at the hands of
barbarians. But unless the humanist tradition itself in some form survives,
there really can be no civilization at all.

Louis Kronenberger, Company Manners, 1954

What is desperately needed...is the skepticism and the sense of history that a
liberal arts education provides.


Of course Instrumentalism has positive aspects for furthering
democracy, specifically personal freedom. However, throughout history the
most liberating pedagogies have been teleological. Before we opt to throw the
baby out with the bath water so to speak we must take a closer look at the
possible advantages or disadvantages of a teleological philosophy of
education. Plato’s Republic, Rousseau’s Emile and Dewey’s Democracy and
Education poignantly illustrate the teleological philosophies of some of our
greatest philosophers of education. (For the benefit of those who have not recently studied these three thinkers in a Philosophy of Education course, I will summarize briefly the events and significance of these great works. See Appendix A *Philosophies of Education Summaries*). One perceived opinion is that Plato, Rousseau and Dewey are not similar at all in their educational philosophies. As a non-expert whose primary interest is in education, I ask the reader to suspend prejudices of this kind in order to employ the following reconfigurations of the philosophies of education of Plato, Rousseau and Dewey for the purpose of more clearly assessing our educational history and the alternatives currently before us.

**Unifying Attributes of the Philosophies of Education of Plato, Rousseau and Dewey**

The following are terms that I use to discuss general attributes of their philosophies of education. In reading this chapter, it will be useful to keep in mind the restrictive meanings each holds for this discussion.

**Teleological**

What are the general ideals of education (Plato, Rousseau, Dewey)? In this context *telos* refers to nothing other than that which is the general, overarching purpose of education. The telos however, must be understood as something essential and not the product of
social construction or public consensus. In some contexts, telos carries a religious overtone. In this context, it has no religious implications.

Transformative

In what way do these philosophies change students? For Plato, Rousseau and Dewey, the education process serves to convert latent capacities in students to ordered and reliable capacities for discovering and utilizing knowledge to serve both their own and society’s needs. The process of education, in this light, serves to achieve general capacities in students, not the acquisition of specific content.

Discursive and Participatory

What methodology is employed to both transform and attain these ideals? Because of the previous requirement that the development of individuals’ capacities be a primary goal of the education process, it is imperative that students be involved (intellectually and physically) in practicing such adeptness in scenarios created by their teachers. The education process is an incubator for responsible and reflective action.
Student-Centered Pedagogue

What is the pedagogue's role? In a Platonic, Deweyian and Rousseauian setting, the pedagogue's role is to attend to the students' interests and capacities and work to create scenarios (through dialogue in a Platonic setting or through reflective practice in the latter) that challenge and cumulatively reinforce these interests and capacities. This methodology is distinct from a current trend in educational practice that promotes the "giving to students what they ask for". The student-centered pedagogue, rather, relies upon his own expertise in helping to figure out what students needs are based on explicit request as well as observations.

Democratic

What political and/or social end does education serve? I use the term "democratic" not so much to imply universal or entirely equitable access to education. Rather, the concept of democracy relies upon the expectation that its individual citizens are capable of responsible and reflective citizenry, and this responsibility (as well as right) serves both the social good, but also their individual happiness. Hence, the individual and society are not in a competitive or compromised
relationship, but rather a necessary and mutually reinforcing one. And the education process is essential to the preparation of such a reflective and productive citizenry.

As a proponent of both a general education78 and technologically sophisticated education practice, specifically embracing wide area networks and multimedia I am in an unusual predicament. My predicament is odd because the technologies that I would argue have the capacity to actualize a philosophical ideal of education in the tradition of Plato, Rousseau and Dewey79 are, in fact, being used to deliver its contrary—a radically consumer-driven highly vocational80 and distance education. Many leaders of education reform initiatives are working to transform our education institutions into establishments more akin to supermarkets than centers for reflection, intellectual growth and socially beneficent action.

78 I use “general education” to connote the kind of education intended in liberal arts schooling. It is the term used by the famous Harvard Committee of Ten in their report on general education. See Harvard Committee. General Education In A Free Society (Harvard University Press, 1945).

79 My argument is substantively dependent upon my logical unification of Plato, Rousseau, and Dewey in their philosophies of education. This follows.

80 I do not mean occupational. Dewey intended something other than technical skills education by his use of the term “occupation”. It is different from the vocational. See: Raymond Boisvert, John Dewey: Rethinking Our Time (State University of New York Press, 1998) 100-104.
While it is impossible detail with great precision how digital technologies can serve or authenticate the philosophical ideals of education posited by Plato, Rousseau and Dewey, I hope to demonstrate –and persuade readers to believe- the necessary role of technologies in the realization of their teleological philosophical ideals that Plato, Rousseau and Dewey held for education.

The primary teleological mission of these philosophies is to cultivate in students a way of dealing with the world that is both rational and humanistic. In developing skills and attitudes that are both personal and universal, students learn to function in society with each according to his or her best judgment. This judgment requires a command of curriculum content, intellectual skills, and a moral conscience. These philosophies hold five essential elements in common:

1) They are teleological in that unchanging, overarching principles of truth and virtue guide the educational process.

2) They are transformative in that students are expected to change by the educational process.
3) A discursive, participatory, and interpretive method is required of students.

4) A highly involved student-centered pedagogue guides the process.

5) They aim to educate for the cultivation of reflective and responsible citizens, and by politicizing the educational goal of personal expression and intellect, they have made the relationship between democracy and education a necessary one.

Robust intellectual discussion among citizens is the most fundamental element of the democratic ideal.\textsuperscript{81} In this sense, discussion is not a barrage of unfounded opinions based on individual wants and desires, but a thoughtful exchange between teacher and student and students and their peers.\textsuperscript{82} The teacher's primary responsibility is to cultivate the intellectual and human skills necessary to make intellectual discussion possible. The discursive exchange between teachers and students is an essential component of


\textsuperscript{82} See also Andrew Oldquist, ed. \textit{Can Democracy Be Taught?} (Library of Congress, 1996) for an interesting discussion about how to teach to the cultivation of democratic ideals.
education in a democratic society because on a practical level it prepares
students, in reflection, tolerance, and free expression and, therefore, for
participation in an open community with constitutional ideals. Conversely,
democratic ideals, such as truth, justice, freedom, and responsibility, can only
be realized in a system that requires citizens' participation through argument,
inquiry, and discussion. Education is the means by which we prepare
students to argue, inquire, and discuss issues rationally and effectively. In
this process, teachers play an important role. To develop students' capacities
required for meaningful participation in society, teachers must challenge
students' limitations and nurture their holistic development. Thus, the
student-teacher interaction both reinforces the ultimate values of society and
nurture the growth of the student into a self-reliant and reflective member of
society.

In their conceptions of who rightfully earns the status of citizen, the
philosophers hold similar views of the rights and responsibilities of a citizen -
a self-directed, reflective and active member of society - and share similar
visions of the cultivating role of the pedagogue in helping students to succeed
in obtaining citizen status. The later philosophers progressively place more of
an emphasis on the realization of these democratic goals. In tying individual
happiness to the social good, each holds that, in addition to making good
judgments, citizens in a democratic society must voice their opinions and
work toward implementing them for social improvement. Education, in
Plato, Rousseau, and Dewey, is the means by which students learn to develop
cogent opinions and fully participate in society.

A Schematic Rendering of the Philosophies of Education of Plato,
Rousseau and Dewey

A schematic rendering of the ways each thinker manifests similar
pedagogical values takes the following form:

1. Teleological
   Plato

   In Plato's Republic education aims towards the understanding of what
Plato considers to be the universal forms or concepts necessary for a good life
and for the maintenance of a proper, just, and good social order.83 These
forms exist independently of the individual and society, and the quest toward
their understanding transforms the student into a rational and responsible
citizen.84 Dialogue, as a process of asserting hypotheses and negating or
confirming them through rational communication, is employed as a necessary


84 See Kevin Robb, Literacy and Paideia in Ancient Greece (Oxford University
Press, 1994).
means of comprehending forms, such as justice, and is an important tool in the education for the understanding of universal concepts.\textsuperscript{85}

\textbf{Rousseau}

In \textit{The Emile}, Rousseau describes the formative development of a typical individual, Emile, and the interaction with his tutor, Jean Jacques (Rousseau). In describing this development, Rousseau, like Plato, is able to draw a picture of what an ideal society should look like. In an ideal society, all individuals are responsible for directing the course of their lives and should resist external direction.\textsuperscript{86} All individuals are born with the capacity to acquire intelligent self-reliance, and not only have the responsibility to direct their own affairs but must contribute to the operation of a civil society.\textsuperscript{87} By nurturing the appropriate and natural form of self-love, \textit{amour de soi}, citizens can live cooperatively with one another and productively govern society as members of the \textit{general will}. Rousseau's \textit{general will} is similar to Plato's concept of the sovereign authority that individuals, who are able to comprehend forms like justice that are necessary for good and proper rule,

\footnotesize{
\textsuperscript{85} Allan Bloom, \textit{The Republic of Plato} (Basic Books, 1968) 537-539.


}
possess. Whereas in Plato's scheme individuals cultivate the capacity for good rule by comprehending forms, in Rousseau's, by comprehending Nature individuals are transformed into responsible and just citizens. Nature is a manner of life that is unsoiled by human opinion and false directives, and is the source of enlightenment in Emile's education. 88

Through a "negative" education, individuals engage in challenges designed by their teachers, which cultivate amour de soi, a healthy, self-directed and non-competitive spirit, and are able to comprehend Nature. 89 This education is negative in the sense that there is a conscious effort to negate the prejudices of others that are often found in documents like textbooks and to rely only upon one's natural capacities to navigate in the world. 90

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preparing students for the practice of democracy.\textsuperscript{91} Through a process of inquiry and interest-driven education, students develop the intellectual skills necessary to participate actively within a democracy and comprehend its essential components.\textsuperscript{92} By working cooperatively with their peers and engaging in social problem-solving, students develop the conscience and intellectual skills necessary to advance the democratic ideal.\textsuperscript{93} This ideal is independent of any individual person or society and informs democratic practice as its ultimate goal. By consciously aiming towards this ideal, student citizens help advance its actualization as they become responsible, tolerant, and intelligent members of society. This process of cultivating the intellectual and practical skills necessary to participate in, reflect on, and create a democracy is essential for both individual freedom and the good of society.

In 1929 at an American Philosophical Association meeting Dewey commented on abstraction, replying to C. I. Lewis, one of several commentators on Dewey's philosophy. Lewis had written: “Professor Dewey seems to view such abstractionism in science as a sort of defect—something necessary, but always regrettable; an inadequacy of it to the fullness of experience.” Dewey then commented: ‘I fear that on occasion I may so have


written as to give this impression. I am glad, therefore, to have the opportunity of saying that this is not my actual position. Abstraction is the heart of thought; there is no way—other than accident—to control and enrich concrete experience except through an intermediate flight of thought with conceptions, relations, abstracta. What I regret is the tendency to erect the abstractions into complete and self-subsistent things, or into a kind of superior Being.\(^\text{94}\)

Although Dewey has been criticized for prioritizing the importance of action in education at the expense of thought or reflection, this is clearly not the case or his intention. He went on to say,

\(\ldots\) it is not the role of the philosopher as philosopher to use these "conceptions, relations, abstracta" "to control and enrich concrete experience"; that is everybody's job. The philosopher as philosopher serves as a critic of our ideas and methods of intelligence. Permit me one quote from my book: 'Philosophy's specific role, then, in making our practices intelligent is one of criticism. It works indirectly, criticizing our beliefs and methods of belief formation. Thus philosophical reflection is of two sorts. Philosophers criticize both our practices and the ways in which we establish them. Philosophers are, then, in Dewey's view, cultural critics and logicians, understanding the latter not as mere proof-checkers, but as cultivators of the methods of intelligence' (Transforming Experience: John Dewey's Cultural Instrumentalism [Vanderbilt, 1998], p. 36).\(^\text{95}\)

Thus in Dewey's philosophy the responsibility of the philosopher—in this specific case, the philosopher of education— is clearly to cultivate and critique the methods of intelligence, i.e., those sanctioned and implemented by our institutions.


\(^\text{95}\) Michael Eldridge, online posting, 21 August 1998, Dewey listserve DEWEY-L@GANGES.CSD.SC.EDU.
2. Transformative Plato

In order to achieve the kind of Republic that acts according to justice, an ideal form, Plato contends that citizens must be just. Those who make the laws and rule society must consciously be able to comprehend justice. In order to comprehend justice, rulers must first learn to distinguish opinion (doxa) from genuine knowledge (episteme). The educational process cultivates in students the capacity to distinguish opinion from genuine knowledge. In this process, students are transformed into individuals capable of consistently acting with good reason, in contrast to acting unpredictably and out of ignorance.

The grand purpose of Plato's educational philosophy is to improve society. Some read Plato to say that this means that a few golden children should be educated for the role of leader and rule-maker and the rest should accept the unreflective position of obedience. However, no person in Plato's society can afford to be unreflective, since it would detract from the general good. All education aims to balance the relationship between reason and appetite in each individual and attempts to secure the dominance of reason in each individual's actions, in general. To act according to reason is to act

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reflectively and, hence, as a critic. Thus, although the system itself appears to be impoverished in its thinking about the capacity of classes to participate in decisions of governance, Plato did in fact advise the cultivation of rationality in every citizen in an ideal and theoretical sense. Thus, every youth undergoing a Platonic education would also be transformed into a rational individual with a balanced psyche.

Rousseau

Rousseau contends that "Man is born free, and everywhere he is in chains." So man is born free with good instincts and a capacity for acting in accord with Nature, but civil society, infested with competitive, unnatural, and secondary or unreflective and out of context signals, corrupts him. It is only in a social setting, however, that man can be himself most fully— in his work, his family, and his humanity. To develop the strength of character and intellect to withstand corruption by society and see through the false opinions in society, Rousseau takes Emile to the country, outside society’s center, to be educated. By retreating from the unnatural influences of society and engaging in challenges that force students like Emile to confront and understand

Nature, they recover their natural instincts and so they can direct the course of their lives by consciously choosing criteria and to comprehend truth in Nature.

The internal balance between reason and appetite was also a concern for Rousseau, and we will see later that in The Emile he made education responsible for the cultivation of rational response in action. He was, however, more concerned than Plato with the relationship that the student retained with society and imagined more possibilities than Plato for the individual in society. Not surprisingly, Rousseau's is a psychological treatise in a way that Plato's could not have been. Specifically, *amour propre* and *amour de soi* define two ways in which individuals interact with the world. *Amour propre* is the way society unconsciously encourages youth to develop. It is an egoistic approach to the world that is best understood as externally driven and competitively motivated. *Amour de soi* is the more mature, balanced, and internally-driven mode and the strengthening of this impulse is the goal of Emile's education. That is, Emile is to be educated to undo any symptoms or tendencies towards *amour propre* and to strengthen his tendencies towards *amour de soi*. A good education will have transformed Emile into an individual who has internalized and appropriated *amour de soi* unreflectively.

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Having achieved *amour de soi*, students can develop the intellectual and moral acumen they need to contribute to the development of a just society. They also facilitate their own transformation into mature and responsible individuals. With such insight, students like Emile are able to enter and act effectively in society where they will achieve their greatest happiness and most natural state.

**Dewey**

Dewey held that a democratic ideal can be realized only when individuals are empowered to voice reasonable opinions and take responsibility for governance. An active, participatory, and problem-solving education cultivates in students the intellectual, practical, and moral skills needed to recognize and act on social problems with the tolerance of and respect for diversity that form an integral part of democracy.

Dewey retained the same interest as Rousseau in positing a healthy relationship between the individual and society. More than any other philosopher, Dewey recognized that society held more than arbitrary or accidental significance for the individual.\(^\text{100}\) Rather, it is on account of society

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that an individual can have an identity or achieve personal happiness at all. That is, the relationship between an individual and society is discursive, one holds meaning because of the other. Hence, the project of education is to cultivate a healthy and mutually productive relationship between the individual and his society. Dewey's method of achieving this healthy balance was through the cultivation of a reflective consciousness and problem-solving capacities whose objects of study are social. By developing their analytical and problem-solving capacities, students develop the capacities necessary to direct their own learning and continue the process of growth that is essential to a productive democracy.

In this process of interest-driven and socially-directed problem solving, students transform their capacity for educating themselves through participatory learning into a productive and robust tool for continuous growth and understanding. 101

3. Discursive and Participatory Plato

Discerning the difference between opinion and knowledge is an individual skill, which requires both a natural capacity and an active will for its development. The Republic itself attempts to engage the reader in a

dialogue by forcing him to consider alternative responses to compelling questions. The student-reader is compelled by Platonic ideas and is persuaded by reason, analysis and discussion, to consider the way things are, as opposed to the way things ought to be. This discursive process brings the student reader to an understanding of both the philosophical ideals of Plato, their alternatives, and the process of discursive reasoning itself. This understanding is not simply stated in the final or summative conclusion of a dialogue, but must be inferred from the map of reasons or arguments put forth in the process of discussion or a discursive interplay.

Plato makes almost no explicit recommendations about pedagogy in *The Republic*. He spends more time talking about the content that is appropriate for a good education (lots of math, philosophy, and no poetry) than he does methodology. In many ways, this should not be too surprising. There probably seemed to be few choices in methodology because there were so few pedagogical tools available other than the alphabet, which allowed for

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102 As I mention in a footnote about works on the western canon, pedagogical books get least interesting when specific content and books are named as the definitive works of a quality education. Plato is no exception. For each particular recommendation, there is inevitably an argument to be made for its inclusion or deletion. Plato's explicit skepticism about poetry is something that has provoked many great thinkers to take him to task with his own words. For an interesting look at the mindset of Plato about poetry, that is more complex than what we glean from his words only in the *Republic*, see Julius A. Elias, *Plato's Defence of Poetry* (State University of New York Press, Albany. 1984).
the systematic written rendering of ideas, and, as importantly, there were no existing schools or educational institutions from which he could make comparisons. From his educational goals, however, we can infer what sort of pedagogy would cultivate a participatory and reflective character in developing youth. The character of the dialogues, moreover, tells us much about Plato's thoughts on pedagogy. *The Republic* itself is a pedagogical tool. Its style is discursive and requires its readers to participate in an on-going and interpretive dialogue in order to understand its logic and concluding thoughts. Its concluding thoughts are only summative and must be understood in terms of the process of negation and discussion that occurred throughout the dialogue. From this, and from what we know about dialectic (the method to truth and understanding), we know that the process of education must necessarily be interpretive. It must also extend over a period of time, and be highly individualistic (in the sense that it is largely dependent upon the will, interest, and capacity of the individual), but must also be in the context of a group of other interpretive individuals.

**Rousseau**

As his teacher, Rousseau is obligated to construct educational opportunities for Emile. These opportunities are the moments in which Emile will discover the significance of Nature, and these discoveries will become the foundation of his intellectual independence and moral strength as an
individual free from prejudice. Emile must engage in these opportunities independently and face the challenges presented to him, in the form of scientific theorems and empirical evidence, and must come to conclusions on his own by weighing the evidence at hand.

Rousseau's educational treatise is chock full of pedagogical recommendations. Whereas Plato is most explicit in terms of what content ought to be studied but is vague on how it ought to be taught, Rousseau is nearly the opposite. Emile's education is all about method and the method is always participatory. By actively engaging in the challenges that his pedagogue has constructed, as well as in those that he has happened upon, Emile will be prepared to participate most fully and productively in society and meet the challenges that face him in civil society.

In one example, Rousseau as teacher stages Emile's getting lost in a forest, forcing Emile to call upon his instincts and navigational skills to find his way out. This event becomes Emile's lesson in geography. He must come to recognize that the questions posed by his teacher are often opaque and deceptive. In deciphering their meaning, Emile will come to rely on his own responses to problems. In this way, Emile cultivates the strength necessary to withstand the influence of superficial explanations and the intellectual and moral skills necessary to develop his own validated beliefs.

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Dewey

Dewey himself coined the term "instrumentalist" to denote the method by which knowledge is obtained: knowledge is both acquired and understood in its instrumentality.\textsuperscript{104} "Learning by doing" has become the phrase that is immediately recognized as representative of Dewey's philosophy and practice.\textsuperscript{105}

Dewey has the historical advantage of having witnessed the implementation of a largely content-based and conversely, methodologically focused curricula and observed the strengths and weaknesses of each. Though his philosophical ideal and educational goals do not differ much from Plato's or Rousseau's, his recommendations for practice are much more detailed than these other philosophers' and in some ways are a synthesis of

\textsuperscript{104} The term "instrumentalism" used previously is one that I coined specifically so as to differentiate it from a teleological or value-laden philosophy of education. The term is one that imperfectly connotes the meaning of a kind of educational philosophy that is most crudely associated with "consumerism" and more appropriately likened to a kind of "intentionalism" in the German sense. I settled on the term instrumental because it does in my opinion connote most specifically the sense of service to individuals and a pragmatic end more than other competitive terms. My own use of instrumental must be differentiated, however, from Dewey's own use that is necessarily tied to a democratic and ideal end.

them. Specifically, Dewey requires that a good education be participatory in the sense that students must participate actively in order to further their own development and also in order to respond to the needs of society. In addition, by participating in one's education, Dewey intends that students be actively engaged in problem-solving by employing a scientific method on real social problem in educational situations. By so doing, they will develop the intellectual skills necessary to tackle the problems that will inevitably plague them and their society in a reasonable way. This methodological tool and intellectual growth/skill will be useless, however, without the necessary content information. Hence, intellectual maturity must be coupled with substantive informative in order to effectively solve problems and live productively in civil society and are, therefore, the foci of Plato's educational system.

Students come to acquire knowledge and develop the skills necessary to solve problems and improve society through practice.\(^{106}\) The act of doing requires the scientific method, which is a necessary tool to arrive at truth.\(^{107}\) By acting as responsible scientists with a view to fixing the world, students

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develop the skills necessary to respond intelligently to the problems that face them.

4. Student-Centered Pedagogue
Plato

There are at least three teachers in The Republic who demonstrate what Plato's requirements are for a good teacher, capable of educating youth to self-reliance and moral fortitude. The first, and most obvious, is Socrates from whom we learn by example that the educational process must be discursive, and that the teacher's role is questioner and provocateur rather than problem-solver. Through engaging in this discursive process, characters and readers as students learn to become their own problem-solvers.

The second teacher we observe is Plato the philosopher and self-conscious author of The Republic. Plato, the thinker, is constantly evident throughout the work via his theories. By observing which arguments are sustained or defeated, we can ascertain which intellectual and social goals are important to the educational process. The dialogues emphasize the critically important role the guardians, those capable of moral, intellectual, and

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physical fortitude, play in creating a community where youth can come and
develop the insight and skills necessary to become guardians themselves
someday and cultivate responsibility and intelligence in citizens.

The third teacher of The Republic is Plato, the author, who by virtue of
being empowered a powerful tool of expression, primarily the alphabet,
documented his ideas, including the construction of an educational system
capable of cultivating responsible and intelligent citizens in his own time and
for future generations. This teacher is really the first instructor who, by
creating a mechanism for documenting and distributing his ideas to his class
ritualized the study process. This teacher/author employs even a highly
poetic and oral style that it becomes difficult for us to take Plato's
recommendations for the banning of poetry too seriously without greater
explication. It is this teacher/author who through his own actions in the
Academy makes clear that while questioning is an essential component of
good teaching, it is also necessary for a good teacher to take a stance on an
issue. And by writing this complete work, he also makes clear that a good
teacher must take seriously the role he plays in influencing the youth who
will shape the character of society.

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110 Eric A. Havelock, Preface to Plato (Belknap Press of Harvard University
Rousseau

Jean Jacques Rousseau plays the role of the teacher in *The Emile*. From his role as author and main character in the text itself, a well-developed picture of a good teacher emerges. *The Emile* is organized into five chapters, each corresponding to the developmental capacities of maturing youths. The first three chapters address the education of Emile into an independent, problem-solving, and psychologically balanced individual. Rousseau uses *The Emile* to respond vigorously to pre-existing educational philosophies, such as John Locke's. Whereas, Locke had proposed that children are incapable of hearing certain logical truths and must be prepared over time for independent thinking by hearing watered down arguments that increase in complexity and veracity as they are capable of listening to them, Rousseau understood "developmental" to mean something different. Specifically, Rousseau understood that children were at different times in their lives capable of strengthening intellectual, physical, and moral capacities. Education should nurture their capacities and challenge their limitations in order to prod them through development. In the educational scenario, the teachers must concurrently attend to students' developing capacities and construct educational experiences in which students can develop new capacities and challenge the limits of existing ones.111 These experiences must

be designed as a natural extension of the students' environment so that they are compelled to participate actively in society as problem-solvers.

**Dewey**

In *Democracy and Education*, Dewey focuses on the education of youth for the purpose of participation in society. For Dewey, participation in society requires that citizens vocalize and act on interests that are more than desires or wishes. The teacher's role is to transform youths into citizens capable of public expression and rational action. Teachers must be skilled in creating scenarios where the intellectual and practical capacities of students are developed and cultivated through practice. Dewey says, "The problem of the educator is to engage pupils in these activities in such ways that while manual skill and technical efficiency are gained and immediate satisfaction found in the work, together with preparation for later usefulness, these things shall be subordinated to education..." ¹¹² Teachers must also cultivate in students each with unique strengths, weaknesses, or interests, a capacity and appreciation for the democratic ideal and its norms of practice. The teacher role is essential in *Democracy and Education* for nurturing the intellectual and practical skills necessary for students to participate in society.

5. Political/Democratic
Plato

In The Republic, Plato does more than draw a picture of what an ideal city-state would look like. He attempts to draw a picture of how an ideal city-state is constructed and maintained, largely through the fundamental process of educating its citizens. As important as the precepts underlying the ideal city-state are to its construction and maintenance, so too are the individuals who constitute it. For Plato, education both serves this public purpose and will also help individuals find personal happiness by understanding themselves, their limitations, and capacities. Through education, individuals are transformed into self-aware, responsible and just citizens prepared to participate in society. Having been educated, individuals will be better able to make judgments that will improve the social order. For this reason, youth are educated with an appreciation for justice and virtue, the means by which civil society must be ordered. This educational goal is radically different from one that attempts to educate primarily for the internalization of appropriate ways of acting in civil society.

Rousseau

Rousseau clearly has a love-hate relationship with "society". It is society that has chained man with false opinions and inauthentic hopes and
goals. However, it is only in society that Emile will flourish and be true to his own constitution, so his education outside "society" is ultimately for the sake of participating most intelligently in society. Rousseau did not take Emile completely outside society to education him. Emile was not educated in a one-room schoolhouse, nor was he isolated from other people. He is merely taken to the country where he interacts and converses with people who have not fallen prey to the corruption of central society. It is more appropriate to say that Emile was shielded from those aspects of society that Rousseau thought would be detrimental to Emile and were already detrimental to society. It was a primary goal of Emile's education that he be educated to be able to improve society through his own self-direction and his ability to judge false beliefs from true beliefs. For Rousseau, it was important that Emile not be bombarded by or exposed to others' beliefs or opinions before he be capable of developing his own.

Dewey

The purpose of public schooling could not be much clearer in Dewey. Public education prepares students to participate in society as constructors of it and are essential to solving its problems. The concepts, education and democracy, are necessarily intertwined in Dewey's educational philosophy. We do know from Democracy and Education that Dewey expects every citizen to have opinions about, and work to solve, real social problems. Through
education, a citizen is prepared to assert opinions, that are rooted in fact and supported by reasons, and thereby to solve problems.

The value of democracy in Dewey's view is related to the value of fuller participation of all concerned in finding solutions to social problems. The importance attributed to participation is conditioned by the connection between participation and communication. The superiority of democratic modes of social organization stems from their greater facility for an open and free flow of information. As we might suspect, Dewey emphasizes communication. (See Dewey 1929, E&N, Ch. 5.) "Here, as in so many other things, the great evil lies in separating instrumental and final functions." Even intelligence is "partial and specialized" where "communication and participation are limited, sectarian, provincial, confined to a class, party, professional group." Communication is not merely an instrument or means to values; it is itself a primary value. Fuller communication makes participation more meaningful.113

Some youths will go on to become leaders in society. However, career role has little or nothing to do with the responsibility each citizen bears in participating intelligently and actively in society. Reflective, rational communication is the fundamental means by which individual participate in a democracy.

Generally, the differences amongst philosophers are highlighted more than their similarities. However, imagining the consequences of unreflective education reform and practice that seems to run counter to a long tradition of

113 Howard Callaway, online posting, 18 June 1998, Charles Sanders Peirce listserve <http://www.door.net/ariste/homepage/ransdell.htm#aboutariste>.
a particular kind of educational philosophy, it is important to re-investigate
the ties that bind Plato, Rousseau and Dewey. These philosophies have
achieved the rank of the most distinguished, influential (intellectually, at
least) and referred-to philosophies of education. In grasping their
commonalities and attending to their variations, the rationale behind each
and our historical difficulty in implementing them will become more clear.
With this knowledge, we will inform and strengthen our position as strategic
reformers in education.

The educational philosophies of Plato, Rousseau, and Dewey do not,
nor could be expected to, achieve a complete realization of their teleological
ideals. However, Rousseau more than Plato, and Dewey more than the other
two, approximate a closer envisioning of the pedagogy required to actualize
their educational ideals. Each educational philosophy realizes more of the
democratic ideal in practice. Rousseau, for example, assumes, unlike Plato,
that all individuals have the capacity to develop into intelligent and self-
ruling individuals capable of making good judgments and contributing to the
advancement of society. Extending that further, Dewey expected all
individuals to participate fully in the governing, legislating, and
improvement of society.\textsuperscript{114}

\textsuperscript{114} John Dewey,\textit{ Democracy and Education: An Introduction to the Philosophy of
Education} (New York: The Free Press, A Division of Macmillan Publishing
Co., 1966) 297-305.
A common view is that historical change and advancement, including greater tolerance, are causally related to the history and development of ideas. Such causal histories have tended to ignore the underlying impact of technology. For example, high school textbooks on the Enlightenment tend to credit the period's intellectual greatness to the genius of a few great thinkers, including Rousseau and Francis Bacon, with no regard for the tools that made scientific analysis and the sharing of ideas more efficient. History is usually seen as the causal progression of ideas and events. However, the technologies available to many thinkers have played a deciding role in constraining or enabling ideas. Even historical narratives about figures like Alexander Graham Bell, whose genius is clearly tied to the technological, tend to explain inventions causally as the product of human genius and ignore the technological context out of which the idea for the invention sprung.

The Necessary Relationship Between Technology and the Implementation of a Philosophy of Education

Human beings are masterful because of their ability to generate ideas. But ideas are useful only insofar as they are communicated to others or implemented into action. This is important not only for the implementation of philosophies of education in practice, but for the cultivation in students of the skills necessary as citizens to turn their ideas into productive action, the
ultimate goal of a general education. Both communication and
implementation require a mechanism, e.g., the alphabet, speech, type, the
telephone, to express or activate ideas. In this way, the effectiveness and
value of ideas are necessarily related to practice, since the technologies are the
means by which ideas take shape. In addition, ideas are rarely generated in a
vacuum. Ideas are most often a response to an existing or imagined
deficiency in the environment. The deficiency itself is apparent, however, less
because an existing idea is inferior rather than because a condition is
unsatisfactory; because conditions are most often material and obviously
rooted in space and time, they are contingent upon particular technologies. In
this case, ideas are a response to technological limitations or capacities. Often
the ideas for solutions to apparent needs display the influence of the available
technologies upon the imagination. For example, Edison created the first
phonograph with tinfoil and wax cylinders to record the sound. This design
would later be modified as new technologies made the more sophisticated
and durable phonographs possible, but Edison's imagination was greatly
constrained by the tools available to him.

By failing to take into account the role that technologies play in
expressing, realizing, inspiring and shaping ideas, we contort our
understanding of history and restrict our capacity to learn from it.

Educational philosophy, one of the most ethereal subjects in the world of
ideas, has tended almost exclusively to be described as a causal or reactionary
responses to preceding ideas. For example, Rousseau's educational ideas are generally regarded as responses to Hobbe's and Locke's impoverished thinking about the way that children ought best be educated. Rousseau did object to Locke's position that children ought to be reasoned with from early on in their education and that reasoning through discussion and study was the primary focus of education. "General and abstract ideas", Rousseau claimed, "are the source of the greatest errors of mankind." From this and from his theory of the development of the child, Rousseau's educational philosophy can be explained. But in failing to take into consideration the impact that the surrounding conditions, including the available technologies like books, played in transferring ideas to children and pulling them too quickly into abstract thinking, for example, we restrict discussions about educational philosophies to the world of ideas. What is worse is that our understanding of Rousseau's educational philosophy would be incomplete. In all likelihood, Rousseau was indeed influenced by the surrounding conditions, including the publishing industry and the centralization of textbooks in the educational process. In order to improve our own educational practice and do so with a coherent philosophy of education in

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115 Locke's *Essay Concerning Human Understanding* is the text from which most references to Locke's (and hence Hobbe's) nature of the individual contrasted with Rousseau's conception of the human being, and consequently, recommendations for educational practice and ideal, can be found.
view, it is important that we work to understand Rousseau's philosophy of education in all its complexity.

Education as a philosophical and idealistic endeavor is necessarily related to practice. The practice of education is greatly constrained or enabled by what are perceived to be the available educational or pedagogical technologies. These have expanded and diversified significantly over time. Available technologies have also constrained the imaginations of educational philosophers, and consequently, their philosophies of education. In order to understand educational institutions as the realization of existing educational technologies and prevailing and dominant philosophies, we must look to the evolution of the institution as a product both of technological innovation and an underlying philosophy.

In the previous section, we have begun to unpack the educational philosophies of Plato, Rousseau, and Dewey and have identified the essential philosophical components they hold in common. By focusing attention on

1) The technologies and technical innovation of their time,

2) Their use in educational practice, and

3) The ways in which the technology was perceived to be an enabler or a detriment during each philosopher's historical period, and how it impelled each thinker's educational philosophy, we will better understand the alternative strategies of educational reform that were available to them in practice and in ideal, but which they did not choose. In the Middle Ages, for
example, images were the primary sources of information for the general public and were the means by which political figures attempted to sway public opinion. Generally, images are thought to convey much more emotional energy than text or print, but are less rational. As such, it is conceivable that they could have been powerful tools for politicians and others attempting to persuade public opinion. One must wonder, however, whether the perception that images are “deceptive” or not particularly useful means for delivering information was not also compounded by the fact that we lacked the tools necessary to manipulate, duplicate or distribute images easily. Images were not easily reproduced or transported in the Middle Ages. Thus, for this reason, and many others, print and text dominated as the means by which ideas were expressed and used in educational practice.

Plato and the Alphabet

Plato is the first known philosopher of education. Of course, the Pre-Socratics are an important part of our intellectual history, but their

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117 Images have become important conveyors and sources of information now in our mass media culture. It is important to note, however, that we now also have the tools to create, disseminate and manipulate images a form of empowerment which has occurred only in this century.
intellectual contributions concerned metaphysics more than they did education or the role that education played in shaping society. Their insights were the product of their own interest in understanding and studying the world around them, not so much how to generate that same capacity in others. Of course, this kind of reflection is the first step in the teaching process. Educational philosophy, as the study of how the uneducated become educated, is more concerned with the process of how individuals attain understanding than with exclusively metaphysical or ontological concerns. While educational philosophy assumes metaphysical precepts, it is more specifically concerned with the means by which individuals acquire the intellectual tools and capacities to understand the nature of things and to act and live well.

The term "education" itself, from the Latin "educare," means to lead out of and indicates a now familiar relationship between teacher (as one who guides) and student (one who is led), which can be understood generally as "the leading out of ignorance." In order to escape ignorance, students are led beyond their capacities by engaging in opportunities, usually constructed by a teacher, for intellectual growth and development. As students mature, the kinds of resources they need to confront the intellectual challenges posited by their teacher generally go beyond what they already know. Consequently, the education process has as a main goal the cultivation of the intellectual skills necessary to locate, judge, synthesize and accumulate the knowledge that is
beyond them (not yet within them) to solve the challenges before them. This process is one that requires tools that convey content and intellectual skills, as text resources have done for centuries, but also the intellectual tools necessary for self-directed learning. With these skills in hand, students to begin to direct and manage their own learning in the process of education.

Information transfer is central for nearly all education activity. Specifically, the teacher must directly deliver information to students when necessary, but at other times must create scenarios for the students in which the goal is to conclude or decipher unclear or ambiguous information. The purpose of the latter is to nurture students' capacity to manage information systems on their own. Of course, the ultimate goal of education is not precisely information management as an end in itself, but the ability to act responsibly and justly within an increasingly complex society with greater amounts of responsibility and personal freedom. In effect, the goal of education is itself not technical or specifically methodological, but does require a command of the information resources to achieve its more profound and civic goals, a reflective citizenry. This entails that students and teachers, in their role as leaders, possess an understanding and command of the means to information production (authorship), consumption (study) and distribution (teaching). In this century, rapidly approaching the new millenium, it is apparent that the technological is closely tied to the educational. The World Wide Web has become an important tool for many
students in the processes of education. Every substantial library has afforded
Web access and most have begun to implement or develop plans for
digitization of collections. For the role that these technologies play in the
education process as tools for information transfer, and reading and writing
tools, it is imperative that they be taken seriously in any philosophical look at
education.

As idealistic, esoteric, and philosophical as Plato's educational
philosophy in The Republic may be, it could not have been imagined or
described in a meaningful way if the tools for transferring information to a
reader and between teacher and student, for example, were not available.
How did these tools affect and enable us to educate for civic participation?
How did they affect and enable the first philosophy of education? How did
they influence and enable succeeding philosophies? By better understanding
how technology and educational goals are necessarily related, we will
improve our opportunities to consciously elevate the human condition
through education.

At first glance, from a contemporary perspective of technology, it is
unclear what, if any, influence technology could have had on Plato's
educational philosophy. There were no computers, World Wide Web, or
videoconferences available to Plato. There were only students and teachers
and text and dialogue. The Academy itself was not so much a place as it was
an idea. There were no rooms delegated as biology labs or reading rooms.
The Academy was an idea for education, however, that could not have transpired if there were no means to transfer information from teacher to student in a systemic way, or if intellectuals were unable to externalize their ideas as concepts that would become the subject of “class” discussions.

The alphabet was the means by which speech could be externalized, documented, and objectified by an author which itself greatly fueled the potential for intellectual discourse and reflective thought.\textsuperscript{118} The alphabet was also the basis for transmitting information/knowledge through time. Specifically, whereas speech fails (this is, of course, not true in a culture capable of recording) in enduring through time, written documents succeed, thus enabling study and research. The existence of the alphabet, a technology, afforded Plato the opportunity to imagine and document his own philosophy of education. In looking at how this fundamental technology, the alphabet, influenced the development of a range of standard educational activities like reading, writing, discussion and study, we will better understand the ways technologies promoted some and ruled out other educational practices and ideas.

The discussion of concepts is central to Plato's educational philosophy. To a contemporary audience, the term “concept” is familiar and transparent. In the 4\textsuperscript{th} century BC, however, Plato's centralization of the study of concepts

and forms was innovative thought. Plato's predecessors were having metaphysical discussions and clearly positing concepts in their discussions. However, a concept retains its strength of meaning for educational purposes when it is expressed with awareness that it has an objectivity and externality of its own. An oral culture does not engender such an objective stance to the ideas that one expresses in speech.¹¹⁹ That is, lacking the means to differentiate an idea in speech from one's self or for an idea to endure in time in an oral culture, "ideas" fail to take on an objective character. An alphabetic culture, however, does afford the tools necessary to objectify, document and retain ideas. By externalizing speech on papyrus by way of the alphabet, subjective opinions begin to take on an objective character, one that can be reflected on, criticized, and perfected. Consequently, by way of the alphabet, concepts and ideas became possible objects of study and discussion, thereby radically expanding the opportunities for education.

By externalizing and objectifying ideas, the alphabet allowed intellectuals, authors and readers, to psychologically separate themselves from words and to begin the process of distinguishing opinions, which are essentially subjective, from knowledge, which is rooted in something more objective. With this psychological distancing of ideas, Plato was able to

¹¹⁹ Rosalind Thomas, Literacy and Orality in Ancient Greece (Cambridge University Press, 1992) 33-34.
outline an entire educational system founded upon the power of concepts to discipline, educate, and empower individuals.

In addition to externalizing and objectifying ideas, the alphabet, because it is a logical, abstract system whose parts have only an arbitrary relationship to the meaning of words or ideas, also extended the abstractness of the alphabet as a tool for generating words and, therefore, ideas. Hence, while externalization and objectification offered the necessary psychological tools for an education through ideas, the logical and abstract nature of the alphabet, a system which can be organized and reorganized indefinitely, furnishes educational practice with the tools necessary for generating a language that has no bounds. Hence, expanding the range of “ideas” discussed or studied in an educational setting, one can easily imagine how the subjects of study moved quickly beyond the descriptive and into the theoretical.

Both the physical characteristic of the alphabet, i.e., the fact that it has to be written on something, and its rational and systemic nature increase its propensity to endure in time. The capacity of ideas to endure is essential for the progression of ideas over time. In the long term, this temporal endurance is important for us in not only constructing our history, but also in learning from the past. In the short-term, however, this durability through time of ideas allows teachers and students to expand upon ideas in ways that are impossible in an oral culture.
In addition to expanding the complexity and kind of ideas developed, the durability of ideas, permitted by the alphabet, the audience (or recipient) of the idea no longer requires a real-time relationship with the generator of the idea. Specifically, the "author" of the idea in an oral culture would deliver through speech his idea to a specific audience, which greatly delimits the distribution of that idea and, hence, diminishes its effect. Or the author would have had to entrust the delivery of his idea to a bard or muse who would necessarily decrease the accuracy by which the idea was delivered. By means of the alphabet ideas were translated with a high degree of accuracy by their original authors and transmitted to audiences other than those that have an immediate relationship with the author, and because of it, ideas took on an increasingly important role in society and education.120

As a tool for promoting the study and distribution of ideas, the alphabet, as an important technological innovation, began, along with papyrus, writing instruments, and all the other tools that we have come to know as essential to education, the institutionalization of education and united the philosophy of education with practice. There were, of course, other technological innovations that failed to take root or become systematized because there was no market, or they failed to integrate with other favored technologies, were

costly or inconvenient. Technological innovation happens this way. The attempt in this foray into the history of the technological and the impact that technological innovation had on Plato, for example, is not to show that new technologies develop magically and consequently open new doors for humankind. Rather, technological innovation is the product of both human invention and intention and successful only when it promotes or satisfies human interest. Importantly, most human interests, in the case of educational practice, require the technology to take shape.

The alphabet played a pivotal role in the development of the first formal schools and the formation of ideas about education and society. The educational tools developed in the following centuries would support the capacities unleashed by the alphabet for clear expression, objective ideas and reflection. Specifically, reading and writing tools were developed. Papyrus scrolls evolved into manuscripts that extended the rationalization of the expression of ideas that the alphabet began; specifically, the folio system that would later become the pagination system was ordered such that ideas could be accessed through citation.121

So it is, always, even when quickly glossing over how the folio system afforded the development of more complex addressing schemes that

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eventually led to pagination, it must be understood that these technical advances are causal only insofar as the cause is human-intended innovation. The historical effect is not so much a particular tool as product, but a tool which has facilitated educational practice and whose usefulness is subject to the

2) Availability of competing technologies which might serve the same purpose, and

3) Extent to which it actually achieves its intended purpose or satisfies a new one.

The Printing Press and the Publication of Information and Rousseau’s Adverse Reaction to Books

With the invention of the printing press in the late 1500’s, the dissemination of ideas initiated by the alphabet became a public opportunity. Many tools of education had been developed that radically improved the quality of reading and writing, but the printing press was the first educational technology to improve the dissemination and consumption channels of print information to a more equitable state.\(^\text{122}\) For the first time in

history, books were mass-produced and sold or distributed cheaply. The general public could then expect to participate in the consumption of ideas.

In fact, many school systems that developed from the 1500’s through the 1700’s, became radically more “public” by virtue of the printing press. The educational practices developed in these two centuries would remain intact and unquestioned for centuries.\(^\text{123}\) In writing *The Emile*, however, contrary to Plato’s newfound optimism and enthusiasm for educational practice because of the technologies, Rousseau’s educational philosophy was in many ways a reaction against the effects that technologies were having on education practice and philosophy.

When Rousseau says, “If, instead of glueing a child to books, I bury him in a workshop, his hands work for the profit of his mind; he becomes a philosopher and believes he is only a laborer,”\(^\text{124}\) he is suggesting that books, which over the preceding centuries had become the central means of educating, were detrimental to the educational process.\(^\text{125}\) How is it possible

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\(^\text{125}\) My own focus, because of my interest in the ways in which technological innovations and circumstances have shaped educational practice and ideals, which has been largely unrecognized in the field of philosophy and education, has been on the publications industry and the behavioral implications of “the book” and “print” on study. Many very good more general resources exist on the subject of Rousseau’s resistance to reading. For
that Rousseau's educational philosophy that is so like Plato's could reject the tools that were a mere extension of the alphabet that was central to Plato's educational philosophy? To understand Rousseau's response to books, one must understand the role that print played in early-modern educational reform between the Mid-1400's to the late 1600's.\textsuperscript{126} Beginning with Erasmus's text-based instruction techniques, the systemic reform of educational practice through printing promoted a radically more egalitarian system of education than ever before. Instructional materials could be manufactured and distributed economically, and the teacher's job became much easier. And because it was easier to systematize teacher training and make it available to more teachers, the teaching profession became more accessible as a result of the mass production of instructional materials and textbooks.

With greater accessibility to ideas through books and with the invention of the printing press, educational reform efforts shifted towards equitable practice. With more equitable distribution of educational opportunities, however, systematization and routinization in educational practices encouraged a passive student body; as books became not only central to the study process, they were also revered as information sources.

more explication, see Janie Vanpee, "Rousseau's Emile ou de l'education: A Resistance to Reading", Yale French Studies (No. 77, pp. 156-176).

Hence, discussion and interpretation, means by which students actively participate in the study process, were not routinely encouraged because the information presented in books was thought to be sufficient. A consequence of centralizing the content in print or books in the education process, was that the criteria for excellence were tied to that content. With the standardization of testing by making the criteria for knowledge explicit and objective, competition among students was encouraged.\textsuperscript{127}

Authorial tools for expressing one's self in writing improved to the degree that all students could expect to achieve the role of unpublished author. Ideas were mass-distributed through print. At the same time, ironically, the schools became over-regulated and tended to stifle originality and free thinking and study. In the opinion of many intellectuals, including Rousseau, the improvements in instruction undermined the study process.\textsuperscript{128} For Rousseau, for whom a participatory education is so essential to the process of learning and developing responsibly, the passivity associated with textbook learning and instructional materials adversely affected growth.

\textsuperscript{127} The twentieth century has seen the standardization effects of the textbook at the national level. The California Board of Education selects textbooks for its own system. Once California buys, other states follow its lead and its choices become American education fact.

\textsuperscript{128} Robert O. McClintock, "Toward a Place for Study in a World of Instruction", \textit{Teachers College Record}, Vol. 73: 2, December 1971: 161-205.
To better understand Rousseau's reaction to educational practice and books in general, one must also look to the state of publishing in 18th century France. Paris, the boiling pot of French politics, was an Information Society already in the 18th century. The government took great pains to censor all information on internal politics and to generate propaganda for swaying public opinion. Without a free and legitimate publishing industry, the French public created its own underground publication system, especially in Paris, the focal point of political discontent. Illegal books (*libelle* or *chronique scandaleuse*) accounted for numerous book sales in 18th century France.

Political commentaries disguised in poetry and fiction were distributed to the public through the underground system, which was comprised of politically conscious but working class men and women, many of whom worked for the noble class. Their publications were generally rooted in some truth, but were clothed in fictional names and biased proletarian propaganda. Authors discovered by bourgeoisie police were sentenced to lengthy jail sentences.

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129 Taken from a lecture given by Robert Darnton at the New York Public Library in the Spring of 1998 on the diffusion patterns of six poems published in the illegitimate, but prominent underground publications system in pre-revolution France. For a fuller exposition on the subject, see Robert Darnton, *The Forbidden Best-Sellers of Pre-Revolutionary France* (Robert Darnton, 1996).


Since explicit references in the underground publications which would make sense of news and public affairs were lacking, groups of people would convene in the salons to pool knowledge, discuss publications, and work to come to some sort of consensus on the accuracy of the news. This complicated, though fairly extensive, communications system required a significant amount of deciphering. It cannot be surprising that Rousseau's educational philosophy, which asks a student to actively engage in truth seeking, recommends disengagement from society. In this way, the communications system and communications technology of 18th century France were responsible for shaping Rousseau's educational ideals and philosophy.

In spite of having been widely read, Rousseau's recommendations for practice had little effect on the way education was actually administered and practiced. In part, the systematization that occurred as a result of the development of techniques of education and an increasingly public openness to education were too powerful to combat. Perhaps, more importantly, however, Rousseau's treatise was not intended to serve as a strategy for educational reform, but, rather, as an ideological tool for reflecting on the goals of education.\(^{132}\) In *The Emile*, Rousseau seems to exaggerate the degree to which books should be kept out of the educational process and the degree

to which the process itself should be outside of society; he himself chose to
write an educational book and remain within society. However, his
exaggeration and educational philosophy are indicative of the caution that he
reserved for the effects of the technology of his day.

Dewey's Faith in the Scientific Method

Systematization and the centrality of books continued to influence
educational practice for centuries. In late 19th and early 20th century America
when Dewey was developing an educational philosophy not unlike
Rousseau's, the text-based system not only showed no signs of decline, but it
had also allowed for the development of mass education. Although Dewey
reacted like Rousseau against passivity in education and study, the
recommendations he made for practice were radically different from
Rousseau's. In many ways, Dewey's optimism for the future of education was
inspired by the technologies being developed in his time. There was no
specific technology per se that Dewey thought would improve educational
practice. It was the scientific method itself that became the cornerstone of
Dewey's educational philosophy. This importance of the method was the
direct result of innovations in technology that made applicability of it
possible by every student. By virtue of the scientific method, students could
participate as individual truth seekers in all of education. The technologies themselves were not so much a necessary tool for study according to Dewey, though they were often useful, but the innovations clearly opened his mind and imagination to the possibility of analyzing, hypothesizing, and empirically testing all experience to serve personal growth through knowledge. In this way, technological development was essential to the unfolding of Dewey's educational philosophy.

Science is very near the core of everything that Dewey said regarding society, education, philosophy, or human beings. Typical of his overall approach to science is his statement that "Ultimately and philosophically, science is the organ of general social progress." The scientific method for Dewey was the only one compatible with the democratic way of life because it lent itself to public scrutiny and because it required intelligent participation in applying objective criteria. Even the humanities and social sciences were to be studied with this method.

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We have begun our discussion on the philosophy of education with an examination of Plato, Rousseau and Dewey, uniting the three philosophers in their views of how the human condition is elevated through education. By further examining the means by which technological innovation exerted influence on their conceptions of a philosophy of education and the recommendations each makes for the practice of education, the complexity of the relationship between philosophical ideals about education and the real technologies available for the practice of education has been revealed. As we move into a digital reform in education, it will be imperative that the difficulty of the relationship is kept in view and that we not disregard the lessons history teaches. If educational reform is to be done consciously, what institutional strategies, technological innovations and educational philosophies must predominate, and in what configurations? I do not claim to generate specific answers to these questions. Nor do I expect that any recommendations for practice would serve our institutional or reform needs. Rather, in this and the following discussion, I hope to persuade you to believe as I do that

1) Philosophical reflection is essential to the practice of education that aims to serve both individual and political ends. And
2) A consideration of the technological alternatives and innovations is important for our advancing the ideal in the real.
Chapter IV

DIGITAL DANTE: DIGITAL TECHNOLOGIES AFFORD THE TIMELESS AND PRODUCTIVE EXAMINATION OF A GREAT THINKER AND POET

The aim of the college, for the individual student, is to eliminate the need in his life for the college; the task is to help him become a self-educating man.

C. Wright Mills, *Power, Politics and People*, 1963

I go to school to youth to learn the future.

Robert Frost, *West Running Brook*, 1928

Digital Dante

In what follows, I will describe a range of experiences that I have had over the period of five years between 1993 and 1998 while designing and implementing the Digital Dante Project in educational settings. Through Dante and his vehicle the Digital Dante Project, we see how the insights of Plato, Rousseau and Dewey take on meaning in a contemporary education setting. The project is comprehensive. Specifically, the study refers to the experiences of a number of different institutions that either contributed to the development of Digital Dante or used it in practice. These institutions include Columbia University (a major research university), Columbia College (a
liberal arts college), Frederick Douglass Academy (a public K-12 school in Harlem) and The Collegiate School (a private K-12 school on the Upper West Side), and a plethora of other institutions connected to the project exclusively through the Web. In many cases the experiences are important because they are inter-institutional and exhibit the potential of Web-based projects to alter institutional reach and affiliation. In other instances, the experiences are important from an intra-institutional perspective and illustrate change in or alternatives to current institutional practice. In most cases, the distinctions are merely a matter of emphasis. The nature of the web is such that intra- and extra- are no longer discrete terms but matters of perspective. The fluid and amorphous character of the Web and the Web-based Digital Dante Project is difficult to concisely define, but this is also what makes it such a powerful tool for provoking educational reform towards a more culturally responsive and collaborative ideal.

While the Digital Dante Project is not reducible to the Digital Dante Web site, an understanding of the Digital Dante Web site will help further understanding of the Project and its incarnations in schools and educational reform activities. Consequently, I will briefly summarize the main components and significance of the Digital Dante project, as well as provide a brief biography of Dante Alighieri and a summary of the *Divine Comedy*. 
**Dante Alighieri, The Poet**

Dante Alighieri, 1265-1321, Italian poet, author of *The Divine Comedy*. A Florentine patrician, he fought on the side of the Guelphs but later supported the imperial party. In 1290, after the death of his exalted Beatrice (Beatrice Portinari, 1266-90), he plunged into the study of philosophy and Provençal poetry. Politically active in Florence from 1295, he was banished in 1302 and became a citizen of all Italy, dying in Ravenna.

*The Divine Comedy*, a vernacular poem in 100 cantos (more than 14,000 lines), was composed in exile. It is the tale of the poet's journey through Hell and Purgatory (guided by Vergil) and through Heaven (guided by Beatrice, to whom the poem is a memorial.) Written in a hendecasyllable form, *terza rima*, it is a magnificent synthesis of the medieval outlook, picturing a changeless universe ordered by God. Through it Dante established Tuscan as the literary language of Italy and gave rise to a vast literature.

His works also include *La vita nuova* (c.1292), a collection of prose and lyrics celebrating Beatrice and ideal love; treatises on language and politics; eclogues; and epistles.

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The Divine Comedy

The movie, “Seven”, poet laureate Pinsky’s translation and the human inclination to condemn have all helped to maintain the visibility of Dante’s *Inferno*. *The Inferno* is the first of three books that as a whole comprise *La Commedia*, Dante’s *Divine Comedy*. The “Divine” was not actually part of the original title, but was added later when the poem proved to take on such great importance in literary and cultural history. The sheer length of the poem (with commentary and notes) is daunting. *The Inferno*, *Purgatorio* (Purgatory) and *Paradiso* (Paradise) each are made up of thirty-three cantos or mini-chapters. There is an additional canto, which serves as introduction to the entire poem, and consequently introduces *The Inferno*. The poem itself is not that long. Each canto averages about 150 lines. As a whole, the poem is about 15,000 lines. However, nearly all translators of the poem annotate significant events or figures with their own notes. In general, these notes generate more text than the poem itself. Yet, most Dante scholars would agree, the notes are critical to understanding Dante because the material is

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136 There are hundreds of translations of Dante’s *Commedia*. Many of them are very good. Throughout my studies, I have come to rely on a collection of translations for different purposes. The Mandelbaum is poetic and correlates most realistically with the original. The Sinclair and Singleton have exceptional notes. The Longfellow is a bit out of date, but is useful for non-Italian speakers to compare with the Mandelbaum to gain a better understanding of the poem. The Pinsky version is entertaining. See the bibliography for full references to the translations.
historically based and he was such a complex thinker and dense writer. This is true particularly for a new reader of the poem.

Dante innovated upon poetic traditions with *The Comedy* by 1) choosing to write in the vernacular when other authors were using Latin, and 2) creating a new style called terza rima which required that the first and third lines of every tercet rhyme and that the second line of the tercet begin the next tercet's rhyme pattern. This latter innovation has made translating the poem extremely difficult. Few languages, and especially not English, facilitate these rhyme patterns.¹³⁷

When Dante began writing the poem, the politics of his country were chaotic. The brief biography above alludes to the warfare occurring between the Guelphs and the Ghibellines. This was only a small part of the uncertain and bellicose culture of Italy at the time Dante was writing, beginning near 1300. A central issue of the discontent and discussion was whether political

authority ought to reside with the papacy and the Catholic Church or Emperor and his aristocrats. Dante, himself, as we see in *The Comedy*, believed in the strict separation of powers: that the Emperor should govern with the secular sphere and the Pope in the spiritual sphere. Moreover, each individual is ultimately responsible for his own actions and the consequences they have on the good of society. These issues play themselves out in the plot of the poem where Dante narrates a commentary on corruption and beneficence in history (mythological and classical), politics, and the church.138

Dante the pilgrim is the protagonist of the story that begins *nel mezzo del cami di nostra vita*, that is, “midway upon the journey of our life”. This midway point is representative of the turning point in one’s life when one realizes that he can either go on living life passively or consciously choose its direction for goodness, fame or pleasure, for example. We find out later in the poem that Dante’s life’s love, Beatrice139, has arranged Dante’s upcoming pilgrimage through Hell, Purgatory and Paradise with the poet, Virgil, as his first of three guides. The apparent purpose of the journey is to bring Dante to

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139 Beatrice is clearly one of the most complex and studied figures in Dante’s *Comedy*. The woman and the figure held important influence over Dante’s writing and perhaps life. See Charles Williams, *The Figure of Beatrice: A Study in Dante* (New York, Octagon Books, 1972) for fuller explication.
a better understanding of the consequences of his actions according to a theological system of justice (Dante’s version was informed significantly by Aristotle). This is accomplished in large part by illustration of the placement of historical figures (including some living at the time Dante was writing) in various sections of Hell, Purgatory and Paradise.

It is a poem that has many complicated strains. There is the allegorical story of history and theology through the eyes of an encyclopedic mind. There is the psychological element to taking responsibility for one’s actions and consciously directing one’s life; in some ways, Dante’s journey illustrates a therapeutic method. There is the pedagogical story to be told through Dante the pilgrim’s eventual “mitre-ing over himself” vis-à-vis guidance by his teacher, Virgil, whose capacities will linger far behind those of his student’s.

The Digital Dante Web Site

In short, the Digital Dante site (http://www.ilt.columbia.edu/projects/dante/) is a Web-based study place for Dante studies and scholarship.

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140 See Etienne Gilson, *Dante and Philosophy*, translated by David Moore (Harper & Row, New York, 1963) for further explication on the philosophical ideas inherent in Dante’s works.
The site itself is comprised of over 60,000 static files, which include primarily text, image and audio files. A main component of the project is its section devoted to *The Divine Comedy* (see fig. 5).


Two English translations (Longfellow and Mandelbaum) and the original Italian version of *The Comedy* (in full) are available on the site. The online Library to the site contains full-text versions of collections of works that Dante read, wrote or might be useful in interpreting Dante’s works, e.g., Plato’s *Republic*, a work that Dante did not read, but greatly influenced Aristotle’s *Nicomachean Ethics*, an important influence on *The Divine Comedy* (see fig. 6). In addition, users may also read collections of articles written by world-renowned Dante scholars as well as by middle school, high school and college age students. Some of the library materials have been written specifically for Digital Dante and do not exist in hard-copy published form. Some of the articles have been submitted by users not affiliated with a particular educational institution, but rather, comprise an “amateur” audience whose interest in Dante is not so much central to their profession or schooling, but rather is a personal interest. Most of the works are in translation (English), but some have been submitted in Italian as well by Italians (dissertations have also been submitted for review, some in Italian from students in Europe). Many users read online. Others only print out materials to read at their leisure. Some of the resources are used only in part as research or study tools.

The site also hosts a collection of hundreds of images that are illustrative of events, people or places in The Comedy, influenced Dante's writing or are interpretive visual metaphors inspired by Dante's life and works. The images have proven to be an extremely popular component of the Digital Dante Project. They are used as enticing and entertaining objects of a Dante study. They have also proven to be important tools for teachers in bringing Dante to life for their students or for students as they interpret Dante
or create their own artistic renditions of a Danteseque concept (see fig. 7).

Although Dante is unique in having inspired so many art works and having utilized so many images in his development of *The Comedy*, images are not routinely incorporated into scholarly or academic studies of Dante. The Digital Dante Project was really the first experiment in giving a central role to images in the study and interpretation of Dante. In an effort to facilitate the academic use of the images, they have been scripted to open in individual floating windows on the Web. Hence, in the manner of an art historian or art history student, users may open the number and kind of images they choose freely and compare or contrast each at will.

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141 I was intrigued with the notion of hypertext and the integration of multimedia resources into textual studies as a mean to facilitate understanding of difficult works. A study George Landow’s work in hypertext began my years long “unpacking” of the various forms that text, narrative and argument can take in an electronic environment. See George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (The Johns Hopkins University Press, 1992) for a more detailed foray into the possible configurations of text in an electronic environment.
Fig. 7. Digital Dante: The Library. Ed. Jennifer Hogan. 1999. The Institute for Learning Technologies, Columbia University. 22 July 1999 http://www.ilt.columbia.edu/projects/dante/library/. This is a screen shot of Canto V of Dante's Inferno. The bold text represents the Italian version of the poem, and the notes are displayed in the bottom window frame. The images on the right are artistic renderings of the Paolo and Francesca scene in Canto V. The screen shot helps illustrate how teachers' tools are expanded in an online environment.

Like all images on the Web, these may be copied, pasted or saved for integration into personal documents.

The use of Digital Dante by educators in their classrooms, in their own professional development and by their students has been substantial enough that classroom materials including syllabi, guides for using Digital Dante as an educational tool and sample projects, comprise a section on Digital Dante (see fig. 8).
http://www.ilt.columbia.edu/projects/dante/classroom/. This screen shot represents a growing collection of resources developed for and by teachers who use Digital Dante for their own professional and curricular development.

My original intent in developing the project was to serve this primary use, though I could not have predicted the myriad of questions that educators would pose, projects they would take on or avenues for reform they would take. The email sent to the Dante expert of Digital Dante
(dante@ilt.columbia.edu), me, personally (listed as editor of the Project) or to the online discussion group, indicates that over two hundred teachers, including college, graduate, high school and middle school, use Digital Dante as a tool to support their teaching. They are from all over the world, and a smaller sub-set has begun to communicate regularly with one another around their intersecting interests in Dante. They comprise The Dante Teacher Network.

Other content materials on the Digital Dante site include biographical information on Dante; a chronology of his life; image and schematic maps of Hell, Purgatory and Paradise; a collection of other Web sites devoted to or informative of Dante studies; a Dante bibliography and links to sites where the resources can be found (or ordered); and a basic index to the site. The content resources on the site have evolved (and will continue to do so) to meet the needs of the population who use it.

Equally important as the content resources of the site are the tools for managing all this site information and for communicating with others who share an interest in furthering their Dante knowledge. The search tool allows users to search the entire Digital Dante Web site by keyword, thereby facilitating navigation through what could otherwise be an intimidating resource due to its sheer magnitude (see fig. 9).
The communications tools on Digital Dante include a basic email function to the "Dante expert", which is intended for questions related to the site or general inquiries about Dante. The email addresses and contact information of the members of the Steering Committee of Digital Dante (world renowned scholars as well as seasoned Dante teachers\textsuperscript{142}) are also available. The online discussion group of Digital Dante situates the most extensive communication

\textsuperscript{142} A partial representation of the Digital Dante Steering Committee includes Teodolinda Barolini (Chair of Columbia University's Department of Italian; author of \textit{Dante's Poets} and \textit{The UnDivine Comedy} [see bibliography]), Joan Ferrante (president emerita of the Dante Society of America and author of \textit{The Political Vision of Dante's Divine Comedy} [see bibliography]), Allen Mandelbaum (poet and translator of Dante's \textit{Divine Comedy}).
about a variety of subjects related to the teaching and study of Dante, and consists of a varied international community. The data on users of Digital Dante shows that most users login from the US or Italy, but there are consistently users from Germany, Switzerland, Poland, France and other countries as well. A separate discussion thread was set up to meet the demands of users who chose to write (speak) in Italian. Through the discussion groups, educators, scholars, students and general Web browsers have advanced or shared their knowledge of or interest in Dante studies. Some have done it actively by engaging in the discussion, others by reading others’ contributions.

The Digital Dante Web site is the culmination of the efforts of hundreds of individuals involved in Dante studies in their professions, studies, or personal interests. The project as it is today and what I expect it to be in the future is not at all what it was six years ago in 1992. Then, it was an idea for testing the capacities of multimedia to expand the audience of Dante enthusiasts. A brief discussion of how the project began, the hypotheses I expected it to test and how it transformed itself into something much greater will also serve to illuminate the unpredictable and enmeshing capacities of efforts when staged in a wide area network and multimedia setting, like on the Web.
I first began my doctoral studies at Teachers College (TC) in the Fall of 1991. I had previously secured an undergraduate philosophy degree from a small liberal arts college in upstate New York, which cultivated in me a passion for philosophy and learning. So much so, that upon graduation, I experimented with the idea of enrolling in a Ph.D. program in philosophy and took a couple course at a local university in Analytic philosophy (primarily the philosophy of language). I didn’t love the courses, but decided that it was the breed of philosophy, not philosophy in general that I didn’t like. So, the following year I enrolled in a Masters program in Continental philosophy, taking semester long courses in Heidegger, Plato, Aristotle, Merleau-Ponty, Levinas and Lyotard. I thoroughly enjoyed the studies but was naggingly frustrated with the notion that my use of the knowledge I was acquiring would be confined largely to the discussions I would have with other teachers and students in philosophy classrooms throughout my career. The following year, I enrolled in the Philosophy and Education program at TC with the expectation that my life’s work would be to serve the usefulness of philosophy and work towards the infiltration of philosophy (what I perceived to be reflective living) into everyday life. I have since come to realize that even purist academic philosophers’ reach can extend beyond local academic circles and that my own inclination towards the philosophy of education had perhaps more to do with my real interest in education. This philosophical
background has shaped all research, development and implementation efforts of the Digital Dante Project.

My first semester at TC, a number of fruitful events took place. I enrolled in a course on Plato’s Republic. There, I met my advisor and mentor, Robbie McClintock. It happened that McClintock held two administrative positions beyond his role as professor. At the time, McClintock was both Co-Director of the New Lab for Teaching and Learning (NLTL) of the Dalton School (a private K-12 school in Manhattan) and the Director of the Institute for Learning Technologies (ILT) of Teachers College. A few months into the semester, McClintock asked me if I wanted to assist the Associate Headmaster and Co-Director of the NLTL in doing research on classes in the 4th through the 12th grades that used new technologies in their curricula of instruction. It was my first opportunity to put my philosophical training to good use—or at least come to a better understanding of what that would mean. I jumped at the chance and began what was a two-year affiliation with the Dalton School. My responsibilities there ranged from documenting how the technologies were utilized in a variety of classes, hypothesizing about their impact (given what I knew of “traditional” classrooms) and assessing how supplementary email conferences, for example, were being used. The most powerful piece of information I took from my experience at Dalton is that students seemed to genuinely enjoy their schoolwork and “get lost in it” when using the software and tools developed for them. The technologies seemed to
afford a host of reform alternatives to schools that could make education more fun and challenging to both students and teachers. And the capacities of the technologies were as yet largely untapped.

With these beliefs crystallizing, I began to focus my energies on developing a project that would both develop out of an interest in a long-standing tradition in the philosophy of ideas and the application of it to educational reform. ILT served as the think tank/lab environment where I (and others like me) experimented with ideas. I kept trying to give my key to the lab back to McClintock so that other students might be able to use the networked facility, but he encouraged me to hold onto to it and use ILT as a place for study.¹⁴³ My own graduate education is a case study for how to cultivate reflective practice through free thought, self-directed study and access to powerful tools and challenging thinkers. But, that is a different study altogether. The important fact about ILT is that its mission and infrastructure is wide area network based. Hence, my own experimentation with the new technologies could and did inhabit the entire wired world. Consequently, the project I would soon begin to develop could test measures to both improve educational opportunities and to democratize access and participation.

In the Fall of 1992, I began to develop what is now the Digital Dante Project. The first incarnation was not a Web site, but a HyperCard stack. The Web would arrive in the form of the Mosaic browser in 1993. When it did, I was prepared with a plan to develop a multimedia translation of Dante's *Divine Comedy*. This would be my test project, gauging whether "multimedia" including sounds and images could engage non-traditional readers in a study of one of the world's most difficult works, and if this enriching study could also be entertaining without losing its integrity. I chose Dante's work for a few different reasons. Perhaps most important, I *like* the work and could imagine putting in the hours that I needed to gain the expertise to develop the project for a scholarly as well as a novice audience. Second, the work holds a central role in the canon of Western History and is esteemed by the most scholarly of the scholarly; it is, however, typically studied only in part in

144 While I am dissatisfied at this writing about the quality of debates on the Western canon and the meaning of such a thing in one's education, I am also the first to admit that the works of the most commonly agreed upon canon are excellent (if not exclusive) fodder for study in particular for the purpose of understanding one's self, history and humanity more fully. These seem to be ends necessary for a reflective democracy. So much has been written on the subject of the canon that is impoverished, and all seem to irritate most when *particular* works are named and etched in publication. Nonetheless, the subject is an important one, I think, at least as a stepping stone to discussing what does make for a quality education. Consequently, I do recommend any of the following works for provocative discussion on the subject of the canon and core works of a culture: James Atlas, *Battle of the Books: The Curriculum Debate in America* (W.W. Norton & Co. New York, 1992); Daniel Bell, *The Reforming of General Education: The Columbia College Experience In Its National Setting* (Columbia University Press, 1967); *The Idea and Practice of General
colleges (*The Inferno*) and rarely attempted in high schools or lower grades. It seemed to me that if the technologies could bring this work to life for a more general audience the benefit would be twofold: 1) more people enjoy the work, and 2) the technologies would prove their power for improving education. In addition, the complexity of the work (its psychological, philosophical, allegorical, religious and historical trajectories) would lend itself to an evolving and comprehensive project. The fact that the work is so vivid and inspires so many visual interpretations seemed like an obvious match for a multimedia setting as well. On a less technical or methodological note, I felt strongly that Dante’s utilization of his own highly iconographic, Medieval consciousness for the writing of a visual poem combined with its density of complex ideas is somehow emblematic of our own educational condition: that we are immersed in a world of textbooks and the written article trying to figure out how to integrate and manipulate Web-based tools, multimedia software and emerging technologies.\(^{145}\) Excited by the idea of

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\(^{145}\) This idea of creating more information-rich environments in a 3D or multimedia setting is not new. It is most fruitfully tied to the medieval tradition of organizing information concisely in conceptual or “virtual” memory theaters. It was a process that likely developed because of a need to recall and create memories lacking a retrieval system like public libraries. The interest in the subject has increased with the advent of the Web and the possibility of creating “memory spaces”, but Frances Yates and Mary Carruthers hold dominion over expertise in the area. For historical renderings of the art of memory see Mary Carruthers, *The Book of Memory: A Study of*
implementing a Daltonesque success story in a setting as broad as the world, I proceeded by creating an electronic copy of an English translation of Dante’s Divine Comedy\textsuperscript{146} and contacting Dante scholars to enlist their expertise in consulting for the development of the project.

Teodolinda Barolini, chair of the Department of Italian at Columbia who is also a world-renowned Dantista and current President of the Dante Society of America, allowed me to enroll in her seminar, Dante’s Comedy. She played the critical role in the scholarly development of the project by persuading other Dante scholars of the merit of the project including Allen

\begin{quotation}

\textsuperscript{146} The first electronic version was not the Longfellow that I later scanned and was the first English translation to go up on the Web site, but a Middle English translation that I found in an old bookstore. This first version is interesting from two perspectives. One, I mistakenly chose the first copyright free translation because it was copyright-free and I could put it on the Web. This particular version had little scholarly merit, which I would later discover when I was successful in enlisting scholarly advice. Second, the book had to be scanned by an optical character recognition program (OCR) in order for it be word-searchable online. This was something I felt strongly about. However, scanning programs were so archaic (in retrospect) in 1993 that the only way to turn the book into an electronic copy was to re-scan it. My family broke it up into sections and did this, only to discover later that it wasn’t particularly scholarly. In only a few short years, likely because of the success of the Web and the demand for electronic texts, OCR programs have advanced to such a degree that I am confident that the same text could be scanned with great precision.
\end{quotation}
Mandelbaum (poet and translator of *The Comedy*), Joan Ferrante (world-renowned Dante scholar and President Emerita of The Dante Society of America), Richard Lansing (Dante scholar and editor of the *Dante Encyclopedia*) and others. She also gave me my grounding in anything intellectual that I know about Dante or his works. It was in her yearlong course on Dante that I first met John Beall, then Dean of Faculty of the Collegiate School who was also a Teachers College student at the time. Beall had been teaching Dante for years at Collegiate in both the middle and high school. Over the course of the year, Beall and I developed a personal friendship and professional relationship that has aided the development of Digital Dante into a pedagogical, curricular and professional development tool that has informed new models for school reform.

Beall was excited at the prospect that the students in his Dante classes (8th and 10th and 11th grade students) could access the scholarly materials of Barolini, Ferrante and other Dante scholars through Digital Dante. Beall says,

Many documents or texts that stimulate the interest and understanding of secondary school students in Dante's poem and Dante's age are stored in research libraries to which my students have had little access. The Digital Dante Project enables my students and me to have access to digitally stored texts, documents, and artifacts that enable them to engage in research and exploration. Thus, instead of a research process scripted by a teacher, the students engage in a process of direct discovery for themselves. The Digital Dante Project has the effect of transforming a traditional "closed reserved" library into an
open resource of scholarly materials accessible to any student at any school with a modem and a computer.\textsuperscript{147}

Collegiate is one of the most competitive and reputable K-12 schools in New York City, and probably the world. By any comparison its resources are immense. The fact that one of its own faculty longs for a more expansive and open library resource for his students is a warning to all educators: a closed reserve cannot possibly meet the intellectual needs of students for specialized and diverse interests. By opening up the library to an infinite number and kind of resources, the Web actualizes opportunities for inquiry-driven and academic learning for all students.

Beall had hoped that the access to more scholarly and expansive resources through the Digital Dante Project would allow the students' interests to be met and cultivated in a way that his own expertise (which is vast and much greater than one could expect of most high school teachers) and Collegiate's library resources on Dante could not satisfactorily do. His students seemed to agree as well. One student in the class remarked:

\begin{quote}
We sit in the classroom for 45 minutes for 5 days a week usually, and we look at someone. However interesting they might be--it's so directed. Like in math class you go through the formulas. There just isn't much looking to the left of the right, it's just going straight ahead ... Digital Dante made the course a lot broader, because you're not following a book, and its obvious linear progression. And you're not just following. Following, however good a teacher is, usually is his way of going through the material. With Digital Dante you got to stop
\end{quote}

\textsuperscript{147}John Beall, letter to Jennifer Hogan in support of a Digital Dante proposal to the National Endowment for the Humanities, October 1998.
and smell the roses and check out the scenery, not even just Dante. But we looked into medieval armor -- or something completely bizarre -- which you're not expecting to find out about Dante. You're able to look at all these other great authors -- before him, and after him, the art of the period, the religion of the period, their clothes, their battles. And so the great thing about Digital Dante is that it was able to enlarge the course.148

Since 1994, Beall has been using the Digital Dante Project as a primary resource for his students in his Dante classes. In the spring of 1995, Beall and a colleague who teaches history designed a course for 8th grade students on the subject of both medieval history and literature. Digital Dante was the impetus for the course. It seemed to spark the imaginations and interests of these two teachers by affording them an enormous amount of new material to offer their students and in a format that enticed students—even in the process of arduous study.

The enjoyment factor is not a trivial point. We expected students in the first Dante class (first using Digital Dante) at Collegiate to use the vast resources. These extended well beyond the textual. However, the students all seemed to gravitate towards the image collections in Digital Dante. Probably they were entertaining. Dante’s imagery is at times gory, at other times surreal. The entertainment seemed quickly to lead to engagement, and some students used the images as a starting point for their academic papers on the

physical structure of Dante's Hell as compared to Virgil's depiction of the Underworld\textsuperscript{149}, for example. These creative papers are examples of the ways in which the technologies can augment the creative capacities of students and entice novice audiences into an engagement with extremely challenging works. One student remarked:

The topic I picked [for my paper] I picked because of \textit{Digital Dante}. I was really psyched that I picked that and that I had all this Digital Dante stuff to look through because I absolutely loved my topic! And I know it wasn't something I would have picked otherwise.\textsuperscript{150}

By all accounts the Collegiate implementation of Digital Dante was a success. Beall is optimistic about the potential of the Web's access to vast and good content materials to enrich his teaching and his students' study. His students' opportunities for and interest in creative interpretation and self-directed study increased dramatically. They seemed happy about this and engaged themselves in research on the Web. My original hypotheses, however, centered specifically on the assumption that new audiences could engage productively in the study of challenging works vis-à-vis wide area networks and multimedia. And in general, I hoped to show that humanities


\textsuperscript{150} Collegiate Student, interview with Institute for Learning Technologies Evaluator, Marianne Bakia, Spring 1995.
and the great works are still productive tools for educating towards a more reflective and democratic citizenry. The Collegiate experiment was illuminating and promising, but Dante had already been taught at Collegiate (very well, by all standards), and the students were already persuaded of the value of the humanities in their high school study.

Consequently, the following summer I began outlining a Dante course that would take place in a typical urban public school setting which had no tradition in Dante studies or the Western Core in general. Through a previous project, ILT had formal relationships with a number of public K-12 schools in New York City. At the time, the manager for professional development at ILT, Djvonne David, recommended that Frederick Douglass Academy (FDA)

151 There are many great historical works which make this claim including those already mentioned like the Harvard Report on General Education and Daniel Bell's look at Columbia College (see bibliography). Few contemporary critics seem to hold this view who are not also reactionaries against the technologies or traditionalists. One little book, however, had an important impact on my thinking. It does hold both a classicist understanding of the role of the humanities in a civic education and yet also understands and propounds the subtle ways in which electronic technologies, in particular writing, help perpetuate this end. The book is Richard Lanham's, The Electronic Word: Democracy, Technology, and the Arts (The University of Chicago Press. Chicago, 1993), and is worth reading for this explication.

152 Both an initial entrance survey queried the Collegiate students with the questions "Is Dante relevant to your life?" and "Is a study of the Classics, including Dante's works, an important part of your high school experience?". It was a 5 point scale that ranged between "strongly agree" and "strongly disagree", and showed that a majority of Dante students at Collegiate strongly agreed that, in fact, the classics are an important part of high school experience.
might be a good school to work with. They had an energetic technology coordinator\textsuperscript{153}, Joan Hazzard, and an open-minded faculty. After a series of discussions with the acting principal at FDA, the administration concurred that a Dante class supplemented by wide area network access to and utilization of Digital Dante would be beneficial to both FDA and educational research. We agreed that the class should be a full semester-long, accredited course and that we would organize the class in such a way that the course could be taught with or without ILT's support in the future. Consequently, in designing the course, we set some primary goals:

1) To compensate for the fact that students in the course had little exposure to the Classics,

2) To provide students with the necessary support materials for their first research project in High School,

3) To get the students comfortable and proficient in using the new technologies,

\textsuperscript{153} Her full-time position was not actually that of a technology coordinator, but an English teacher. Over the years she saw promise in the technology, taught herself some skills and shared her knowledge and experiences with others. As such, she became the functional though not formal technology coordinator. This pattern seems to have been a common one to many schools. The notion that a technology coordinator role constitutes its own funded position in schools is unique to this decade, perhaps even the past few years.
4) To engage them in a semester-long study of Dante’s *Divine Comedy*, and
5) To work with an English teacher at FDA and offer her the professional development education necessary in Dante studies, and
6) To provide the teacher with the skills necessary to use the technology for curricular development and her own long-term professional development so that she could teach the course when ILT support ended.

Sandra Loyd-Blackman, an English teacher who had been teaching at FDA since its opening five years before, volunteered to take on the role of FDA teacher who would undergo her own education in Dante studies and the new technologies. Because Loyd-Blackman had never taught Dante before and proclaimed that she had a lot to learn about his works before she would feel confident teaching a course on the *Divine Comedy*, we decided that her role would largely be a passive one in this first class. I felt that given I had already acquired such in-depth knowledge of Dante and his works (in comparison to what I perceived to be an average high school teacher’s knowledge), the study would be more persuasive if a more representative individual taught the course. Jennifer Kane, then the administrative assistant at ILT, agreed to teach the course. She had recently arrived to ILT after having
taught in Boston's city schools and had just begun a Masters program at TC. She thought the Dante experience was one that would further her interests in education and give her invaluable experience that she could take with her anywhere. Kane had done extensive study in Shakespeare, but none in Dante, though she had a definite interest.

By December 1995, everything was set for the class. The Dante class would be offered as an accredited English class the following semester. We scheduled the class for two full periods two day a week, rather than in one forty-five minute slot five days a week. My previous experience in classes using the Web had been that students require more time and flexibility moving between research, in class discussion and study and project work. Also, because FDA had no classrooms with Web access, the class would take place at the nearby public library, Countee Cullen, and it is only a few blocks away from FDA. The library had four computers with a T1 connection to the Internet (afforded by ILT). Ms. Kane and I worked to design the course assuring that the class was structured to meet the research objectives and long-term sustainability at FDA. I would continue to assist Kane in course development and would work with the students in software and Web development when necessary. Kane would serve as primary instructor to the class. Loyd-Blackman would attend the Dante classes and undertake her own professional development through it. David and ILT would assist in ensuring
that the administrative and technological requirements of FDA, the Board of Education and ILT were met for the course.

Personnel were in place. By word of mouth, a number of students expressed an interest in the course. The technological infrastructure had been accounted for. All that was left was for Kane and me to develop the course curricula and Kane to gain the expertise necessary to teach the course. Really, we were not much further along than any other teacher at square one in designing a course. And the task was not insignificant. David Denby’s, Great Books: My Adventures with Homer, Rousseau, Woolf, and Other Indestructible Writers of the Western World, would come out the following year in which he would assert the following about his own reading\textsuperscript{154} of Dante’s Inferno:

The emotions appropriate to the poem were not available to me. They were connected to the beliefs by which those emotions had once been generated. I could not rise. My reading of Dante was a failure, and of the most direct sort: I didn't enjoy it.\textsuperscript{155}

A teacher’s greatest fear is that the works she chooses for her class will not resonate with her students. They will get bored and lose all enthusiasm for

\textsuperscript{154} Denby wrote the book about his own experience with the Great Books as a student in Columbia College’s Literature Humanities course. In general, many of the Great Books were successfully entertaining and engaging according to Denby, but Dante’s was not one of them. See David Denby, Great Books: My Adventures with Homer, Rousseau, Woolf, and Other Indestructible Writers of the Western World (New York: Simon and Schuster, 1996).

learning. The sterility and brittleness of the great works is almost assured when teachers lack the knowledge necessary to adequately bring them to life, contextualize them or respond to students’ unpredictable questions. The intimidation factor of Dante is pretty daunting to most teachers. It is not regularly taught at all in high schools. When it is, it is usually glossed over. But Beall’s and Barolini’s courses on Dante had a long enough history and substantial enough following that Denby-like discouraging attitudes failed to deter us in our course development.

The students that eventually took the Dante class were in some cases chosen because either Loyd-Blackman or Hazzard felt that they would be enthusiastic, and it would benefit them. None of the students was chosen because they did exceptionally academically. Rather, the students had individually expressed an interest in the class (we would later find that this was due to the fact that the computer component of the class was appealing

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156 The standard NYC Western Literature textbook for high school students devotes a full 22 of 1300 pages to Dante’s *Inferno* (only the first part of the full *Comedy*). Three of the 100 cantos are represented only partially and in translation. Canned questions are provided at the end of each chapter for students and a few of Gustave Dore’s illustrations are placed alongside the excerpts as decorative illustrations.

157 In fact, all of the students said that the technology component of the course interested them in it. Very few named the main subject area, Dante, with their reasons for taking the course. Of those that did, it was primarily for the purpose of making themselves more attractive or marketable to prospective colleges. Fortunately, their interest in the content of the course seemed to change dramatically over time, though it was the technologies that first interested them.
to the students) and they were open-minded. A couple students were recommended because, as students with learning difficulties, their teachers thought that a course which relied upon non-traditional media for course (sounds and images primarily), these students might also do better than with a purely text-based study. This did prove to be the case. In fact, Loyd-Blackman later commented that one of the students who had been diagnosed with a mild learning disability (unbeknownst to Kane or me) improved so dramatically throughout the course of the class that one could hardly imagine she was the same person. She became confident and vocal in her expressions and engaged herself in improving herself through study. As fairly representative and unexceptional students, we expected (later confirmed) that they had very little experience using the Web, much less Web publishing, doing individual research or reading a work as complex as Dante’s Comedy. Consequently, we organized the course in such a way that students would cumulatively and incrementally engage in activities that challenged and furthered their technical and research skills. Intellectual skills were honed and cultivated and then utilized in either the development of some multimedia project or to make public statements to each other or on the Web. Technological skills were always developed in a larger context for the purpose of expressing something about Dante or an issue generated out of the class. As much as possible, we tried to organize lessons that would do this
simultaneously. For example, one assignment required that each student write a letter to a local politician telling where in Dante's schematic of the universe he would place the politician. The students were to inform the politician that they were members of this FDA Dante class, and they also had to justify their condemnation or praise by citing some action or statement that rationalized their judgments. The students used the Web to do most of their research. In many cases, the students found email addresses for the politicians, and emailed them their letters. As much as possible, analogies between the students' familiar setting and Dante's schematic were made in their reading. Often times, this was not possible or advantageous, but in general, the students seemed to appreciate the way in which contemporary issues resonated with Dante's 600 year-old insights.

Judging the students by their engagement and capacity with the poem during the course, one could hardly imagine that their entrance survey responses to questions like "Is Dante relevant to your life?" and "Are the Classics, like Dante's works, an important part of your high school experience?" were consistently negative (unlike their Collegiate counterparts). Fortunately, their exit surveys showed that in response to the same questions, they were all in affirmative agreement. So how valuable was this study to the FDA Dante students? And what does it mean in the context of the previous discussion with respect to the trend towards an instrumental philosophy of education? The FDA Dante course was a single, controlled
experiment. As such, the responses to these questions based on it can be at best only general and indicative, not conclusive. However, a schematic of the course informed by the previous discussion on the attributes of a teleological and instrumental philosophy of education will help lay out the alternatives for course development and institutional missions in the context of digital reform opportunities.

My own expectation and intention in designing the course was that it be informed by the historical tradition of great educational philosophers like Plato, Rousseau and Dewey and what I saw to be their definitive attributes. Was it also instrumental? FDA administrators were supportive of the project for a couple important reasons. First, it would be an opportunity for the students to learn valuable computer skills like using the Web, doing Web development and generally gaining confidence with the use of the computer. Second, it could be a spotlight project for them and be used for grant writing and to attract students. FDA administrators expected that the Dante students would gain competency with the new technologies and that good press would follow. Both things happened. In addition, the students’ desire to learn computer skills proved to be their primary and most powerful enticement to the class. Neither FDA’s nor the students’ desires were consciously or explicitly attended to in the development of the course. Rather, the purpose of the course or its telos was more general: to cultivate in the Dante students a capacity to
engage in, interpret and analogize from a very dense and challenging work of literature.

In the process of the course, some students, like the one that Loyd-Blackman described with a learning disability, were obviously transformed. She became more confident in her capacity to express herself and share her ideas and in her ability to solve problems by doing her own research. All, according to Loyd-Blackman significantly improved their research skills and confidence in coping with an intimidating work. By the end of the course, students were throwing around Dante’s name as though he were a live figure. Their stance was not that of reverence for Dante like many students and scholars but a much more collegial one. They felt Dante speaking to them about issues in their world, not just about 13th and 14th century Italy. Their willingness to and confidence in interpreting and applying Dante’s work were impressive and will serve them in their future studies. I witnessed so many impressive student transformations in the course of the Dante class that it is difficult to name them all. One important transformation that occurred across the board was the students’ change from timid speakers who could not or would not use the text or the ideas in it to impassioned and thoughtful interlocutors. Their project work and course assignments on the Web usually required that they work in groups and come to some sort of group rationale or consensus. They would usually have to give a public group presentation and follow-up with an individual paper. The computer seemed to facilitate
the group activity and the students tended to rotate who took responsibility for controlling the mouse typing, for example. Their capacity to interact effectively with one another improved dramatically over time and very quickly their discussions became impassioned and assertive. They seemed to devote attention to information on the computer screen. Read it. Discuss it.

Argue about it. I often sat and listened to their discussions when they worked at Columbia and was bemused by their insights, for instance when the Purgatory group decided that Ross Perot was guilty of “envy”\textsuperscript{158} according to Dante’s scheme. Unfortunately, those who only view the final projects will never know about the discussions leading up to them or how their capacities to argue and reason, cultivated in the process of developing final projects, are the most impressive and “grade-worthy” matters. These are things that only an instructor, who engages his students in a series of participatory and discursive exercises, heavily reliant upon human interaction, can witness or cultivate.

The students’ engagement was considered to be a basic criterion for leading them to a general understanding of Dante’s work, its importance and implication. The design of the course attended to this group of students’ particular needs and background. The lessons utilizing discussions of the

\textsuperscript{158} Digital Dante: Students’ Work, ed. Jennifer Hogan, Institute for Learning Technologies, Columbia University, 23 July 1999
empowerment zone in NYC and local politicians were tools for creating conceptual bridges between the ideal polity and corrupt public figures in Dante's text. The student-centered approach proved to be highly effective. It also seemed to be an essential component of activating the intellects of the students to take action on a political or social issue. The students were extremely enthusiastic in the assignments that required they write letters to politicians, position papers, and create their own interpretations of Hell, Purgatory and Paradise (see fig. 10). The teacher's role and primary focus was to ensure that in each of these the project showed not only creativity, but reasoned responses informed by or in reaction to the work that was the subject of their study. As such, the course cultivated the students' reflective and active intellect.
HELL: CIRCLE 1: LIMBO

THE VIRTUOUS PAGANS

They were born without the light of Christ's revelation, and, therefore, they cannot come into the light of God, but they are not tormented. Their only pain is that they have no hope.

Mayor Rudolph Giuliani

Mr. Mayor, you may have cut crime rates and you may have helped New York City regain a wonderful Times Square area. But you are going down. Spend the afterlife in the first circle of the Limbo. FOREVER. You have no patriotism to the people of New York. You don't care about who or what you hurt, you just care about getting results so that your record looks good. Well, in my book, you aren't doing so well. Ever since you became the mayor, you have been planning to disband some of New York's public hospitals and develop them into private hospitals and cut funding going toward hospitals. In almost every other state on the Earth, diplomats receive what's known as diplomatic immunity. Not here. Giuliani wants to be selfish. I think you deserve a long time in Hell. Not because you are a bad person but because you think about your own needs too much. Enjoy life in Limbo.

For more information on Rudy Giuliani =>
An article from The New York Times on-line
An Article from The New York Times
Commentary on Giuliani

Fig. 10. Digital Dante: FDA Student Projects. Ed. Jennifer Hogan. 1999. The Institute for Learning Technologies, Columbia University. 22 July 1999 http://www.ilt.columbia.edu/projects/dante_old/fda_class/inferno/limb.html. This screen shot represents the FDA Inferno Group's placement of Rudy Giuliani in their own metaphorical Hell. They present the work as their own opinion, but offer rational justification, as well as links to other Web sites for viewers to make their own judgments about Giuliani.

Kane became incredibly adept and admirably creative in her ability to create lessons which pulled the students into their Dante studies and encouraged them to use their own personal knowledge as a springboard to
their own public commentaries. In the Introduction of this dissertation, the lesson in which students discussed Dante's personal and social nemesis and then their own is but one example. In class and out of class, students were invigorated by Dante's insights, colorful language and ideas. Kane's own education in Dante studies and teaching was fueled in part by her self-directed study of the comprehensive Digital Dante Web site and the Mandelbaum edition of *The Comedy*. In addition, however, Kane met a few times with Beall and shared ideas about curricula and lessons for the course. Kane also took advantage of the opportunity to communicate with Dante scholars around the world and other Dante teachers, thereby utilizing the Web to further her own development as a teacher.

Skillful teaching in any discipline entails a twofold responsibility: 1) a mastery of the subject material, and 2) adeptness with the skills of pedagogy. Kane's experience using the Web as a facilitator for both her own professional development in different content areas and as a skilled teacher is promising as a means to integrate what have historically been exclusive expertise's of the predominant methods of teacher education. The different hiring patterns on the part of public schools and private schools help illuminate the different methods of teacher education. Specifically, particularly with respect to high 159 Loyd-Blackman observed that in the hallways of FDA students in the Dante class would talk colloquially about their own Francesca-like sin of lust, for example. And these references were shared not only with Dante class participants, but with other students as well.
school teachers, public schools have tended to hire individuals who received training from teachers colleges and private schools have tended to hire individuals who received specialist degrees, e.g., a Masters degree in English Literature. On the one hand, a methodological education in the general skills and requirements of teaching (a practical endeavor) is validated. On the other, an education in a specific content area is sought out. Oddly, rarely the twain do meet. Yet, in particular in the high schools, where the content requirements by national, state, and institutional administrations are likely to vary, it is imperative that teachers be ready to teach to specific content when they begin teaching. Also, because students’ interests and capacities to engage in different kinds of content is somewhat unpredictable, teachers should expect to alter the courses they teach over time in order to maintain a student-centered approach to education. As such, it would seem that an important part of their training would afford them the skill to acquire content expertise over time as part of their own on-going development as a teacher. This form of professional training has not traditionally been a regular part of teacher education practice. However, given the Web and the kinds of interchange between teachers and scholars made possible by it as was shown by Kane’s Digital Dante example, there is no good reason why this could not become a

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160 See John W. Beall, “Strategic Leadership in Independent Schools: The Recruitment, Compensation and Development of Teachers (Staff Development)” (Diss., Teachers College, Columbia University, 1997).
regular part of teacher education. Kane is also a good example of how a methodological education (how do I go about teaching Dante?) can be successfully integrated with an education in specific content. This requires, of course, that academics and teachers work together (through conversation via email, possibly, or explicit instruction) in the common goal of improving the quality of education, including instruction and study, at the K-12 level.

I have no expectation that the general practices of researchers or academics would or should encourage every Tom, Dick and Harry who has an idea for a course to email Joe-Researcher and expect in reply a syllabus for the course and their own personal tutor. Yet, small and incremental changes in the way in which higher education faculty interact with K-12 instructors would go a very long way to improve the quality of education in our K-12 schools.¹⁶¹ For example, Kane was able to teach the entire Divine Comedy for her first time to a group of high school students who lacked experience in the three main requirements of her course: reading Classic literature, researching, and using the technology. The students’ final projects (http://www.ilt.columbia.edu/projects/dante_old/fda_class/) are not your traditional academic arguments (see fig. 11).

¹⁶¹ Probably also, if this sort of focus on improving the quality of teaching in particular subject areas occurred with their colleagues and less experienced faculty, undergraduate and graduate school education could improve immensely as well.
Yet the creativity exhibited explicitly in the final projects and implicitly by the fact that the students routinely spent entire weekends for months at the Columbia facilities developing their projects are powerful indications of the enthusiasm these students held for their subject matter. In fact, in response to the question, "Would you take another Dante course in the future?" as part of
the exit survey, all students responded in the affirmative. For a group of
students who were not convinced at the beginning of the course that a study
in Dante was at all purposeful to their education, this fact is somewhat
remarkable. Kane's success as a Dante teacher must be highlighted. Did she
require the focused attention of a single Dante teacher or scholar? No. She
posed a few thoughtful questions to a variety of Dante teachers and scholars
in the process of preparing her course and again as the course progressed.

I would like to be careful not to imply that the scholarly or academic
relationship with K-12 teachers in the process of professional development is
one of martyrdom on the part of the higher education community. That is, K-
12 teachers are not the only group to benefit from this relationship. Professor
Ferrante remarked after having responded to the email queries from an 8th
grader at Collegiate regarding a Medieval warfare document that such
sophistication and understanding in the subject is unusual even for a
graduate student. By furthering this student's interest in the subject of Dante
by responding to his email queries, she actively helped to ensure that the
discipline to which she has devoted an enormous amount of her own life
stays alive and with integrity. She also helped to prepare this young man
with a strong foundation in Dante before he enters college. If Ferrante's
practice became routine practice for most college or university professors, one
could also expect that the preparedness of undergraduates for college study
would increase.
As part of an online project I was developing for the Core Curriculum of Columbia College, I had the good fortune of attending a Columbia College Literature Humanities preceptor meeting in the Spring of 1998. The Literature Humanities (and Contemporary Civilization) instructor staff (this includes about 70 members, comprised of both tenured faculty and graduate students) attend weekly meetings to discuss a subject in the Core class, i.e., one of the about forty figures ranging chronologically from Homer to Virginia Woolf or Jane Austen. The meetings are pedagogical in nature and attempt to improve the teaching of the subject as opposed to generating an expert knowledge of the content. They are highly impassioned, a great idea that I highly recommend and goes a long way in making Columbia’s Core exemplary. At this particular meeting, instructors were debating whether or not to keep Jane Austen in the Literature Humanities (Lit Hum) course. It seemed clear that Austen is an important literary figure. However, given the limited number of important figures and the limited time in the semester, Austen was suggested as a figure who could be cut in order to improve the quality of the course. The instructors decided (for this year) not to cut Austen from Lit Hum. There was also the issue of which of Austen’s works ought to be included in the Core. Traditionally, *Pride and Prejudice* was the work of choice. It was agreed that it was her best work. However, it was also posed that perhaps *Mansfield Park* would allow instructors to raise issues of race and gender equity, arguably sensitive and important topics for contemporary students, in a way that *Pride
and Prejudice does not facilitate. After some heated and extensive discussion, the instructors agreed that Pride and Prejudice is both the more important and representative work and it is also the work that is most often taught in high schools. In addition, it was so often taught so poorly in high schools that the instructors saw it as their responsibility to right the wrongs done in high school and continue to teach Pride and Prejudice. At the meeting, through this discussion, I became angry at the system that forces great teachers, like those at Columbia College, to think of their work as an un-doing of what has been done before. If a system, like the one that allowed Jennifer Kane to work with other Dante teachers as well as Dante scholars in preparation for her own Dante class, were set in motion, instructors in higher education could focus their energies on furthering the education of their students. They would also be more free to choose which subjects they want to or should teach according to educational ideals rather than practical constraints, like the fact that their incoming students suffer from a poor understanding of Pride and Prejudice.

In addition to improving the overall quality of general education and furthering the academic integrity and growth of the disciplines, the flexibility in communication between K-12 and higher education afforded by the Web allows academics and scholars to share their passion for specialized subjects with others. Manuele Gragnolati, then a graduate student in the Department of Italian at Columbia supported the Digital Dante implementations in the Collegiate School and FDA in 1995 and 1996 by responding to the email that
the students posted to the “Dante expert” (dante@ilt.columbia.edu) on the Web site. Gragnolati also came in to the FDA class as guest speaker and spoke on “Dante and the body”. The students immensely enjoyed his lesson and asked that he come back to speak again. Gragnolati’s response to participating in the project was tremendously favorable and he has continued to support the project by developing an annotated bibliography for Dante studies amongst a number of other consultation roles. Gragnolati sums up the value of his experience in the following quote:

What I loved about Digital Dante...it was giving sense to what I was doing...The ability to communicate with someone, to share it with somebody—giving my same passion—that is what is wonderful about Digital Dante. Dialogue with students—that is my favorite part! Because I am so passionate about Dante, I know that I could make that alive to a student—and that is important!162

In particular in graduate school, where opportunities to communicate with others about one’s subject of passion are rare because colleagues and instructors are so busy in their own work and research, the opportunities that the Web offers specialists to share their knowledge and discourse about it are invaluable.

The Digital Dante Project has gone on to support hundreds of teachers in their teaching of Dante. Loyd-Blackman continues to teach Dante at FDA. In ‘98–’99 she’s offering a yearlong course on “Art and Architecture in the Time of Dante”. Student assignments include using digital cameras to

162 Manuele Gragnolati, personal interview, Spring 1996.
document Medieval influence on architecture in Harlem. Loyd-Blackman herself took a self-designed course on medieval architecture through a distance education program. Kane moved to Virginia where she took a position at a private school. She continues to teach Dante, but her school is not fully networked. Consequently, she uses Digital Dante primarily as a means to further her own education and encourages her students to use it as a research tool. Their final class projects were not technological in a contemporary sense, but were mostly paper-mache sculpture and acrylic and oil paint renditions of Dante’s universe (see fig. 12). However, digital images of the students’ projects with descriptive captions went up on the Digital Dante site in the classroom section.

These serve to inform other teachers how they might teach Dante to their students. In creating their projects, the students were also aware of the Web presence they would take. As such, they were conscious of the publicness of their projects and worked especially carefully on them. One teacher in Florida, Patty Kmiecik, designed a lesson using Digital Dante in which her students curated their own sections of Hell, Purgatory and Paradise. The list of teachers who have used Digital Dante to further their curricular options and professional development is extensive. Their ideas are unusually creative. All were united and aided in their efforts by the Web. The number of
students who use Digital Dante in pursuit of their studies is equally impressive. Many are formally registered in academic programs ranging from middle and high school to the college and graduate level. Others are "informal" students—lawyers and doctors, computer science programmers and businessmen, who are resurrecting their study of Dante after many years or are beginning anew out of a leisurely interest. All share a common interest in Dante—and access to the Web.

The Digital Dante Project is a single example that helps illuminate how wide area networks and digital technologies can improve the educational experiences of students and teachers in all ranks of institutions. It is a project that required (and still requires) the financial and intellectual support of a number of individuals and institutions, including a major research university and teachers college, a specialized department in the graduate school, a liberal arts college and K-12 institutions. All of these efforts and expertise were united for the purpose of the Digital Dante Project through a single research and development entity, ILT, that supported the development of the project as a research and development experiment. The Digital Dante Project, as described, is a micro example of how the capacities of the Web, multimedia and emerging technologies can improve the quality of K-12 and higher education students and faculty. The consequences of the Digital Dante project were such that each entity worked to cultivate in each group the capacities for and practice of reflective and active intellects in the utilization of information.
Hundreds of sites like Digital Dante presently exist around a variety of different subject areas and disciplines. The content on the sites is abundant, and the tools for communicating with others and analyzing and interpreting the materials are great.

In order to use these sites to systemically improve the condition of education across the board a couple things will have to happen. They are as follows:

First, educators and students will have to come to terms with the fact that a good education is not necessitated by interaction with great Web sites. If access to information succeeded in generating knowledge, those of us who spend all day long using the Web would acquire the intellect of Ph.D.’s in every subject. I know this is not the case and suggest the same to every developer of distance education courses. The cultivation of responsible intellects requires a significant amount of human interaction in addition to personal struggle. The first couple chapters of this dissertation on philosophies of education informing practice will serve to help answer questions about the ideal practices of education and also help illuminate the complexity of education.

Second, attempts to improve the condition of education must take on a systemic nature. Single research and development experiments and ad hoc Web projects have limited reach. Mechanisms to ensure collaboration among K-12 teachers and academics, students and scholars must be institutionalized.
Development efforts across the curricula must begin not on ad hoc interests of graduate students, but at an institutionally supported and sustained level.

Technological innovation and infrastructure development must take priority for the purpose of improving the quality of education in all schools, public and private, elementary, secondary and higher education. In the following chapter, I will attempt to elucidate the ways in which systemic improvement in educational practice vis-à-vis technological innovation can occur.
Chapter V

THE USURPATION OF AN INDUSTRIAL WITH A DIGITAL METAPHOR: TRANSFORMING OUR EDUCATIONAL INSTITUTIONS TO MEET OUR CAPACITIES IN A WIDE AREA NETWORKED AND MULTIMEDIA ENVIRON IN THE NAME OF RESPONSIBLE DEMOCRACY

Many remarkable discoveries and inventions were made [in the nineteenth century]. Most memorable among these was the discovery...that women and children could work for 25 hours a day...without many of them dying or becoming excessively deformed. This was known as the Industrial Revelation.

W. Sellar and R. Yeatman, 1066 and All That, 1931

Change is one thing, progress is another. “Change” is scientific, “progress” is ethical; change is indisputable, whereas progress is a matter of controversy.

Bertrand Russell, Unpopular Essays, 1950

Man is still the most extraordinary computer of all.

John F. Kennedy, speech, May 21, 1963

The institutionalization of polarized educational philosophies poses an imminent threat to democracy. Ironically, the very democratization of education is forcing us to make choices in the kinds of educational philosophies to which we ascribe. It is because education is so accessible to
individuals that an exclusive commitment to one educational philosophy or the other is sure to have systemic consequences. And as wide area network technologies become vehicles for the delivery of education, the systematization becomes more extensive and, consequently, more difficult to change. The imminent radical democratization of access to education due to Web-based instruction requires us to seriously reflect on the adoption of a particular educational philosophy over another.

To sum up the previous discussion of instrumental and teleological educational philosophies, it can be said that instrumental educational philosophies are best characterized by the practices of schools developed in response to the social need for individuals skilled in areas of specialization. In many cases, the areas of specialization were byproducts of technological innovation. In all cases, increasing areas of specialization and the adoption of an instrumentalist method increase opportunities for students to exercise their personal freedom. Instrumentalist educational institutions first proliferated in the US in the 19th century concurrent with the development of a variety of new fields of study with advances made in science and technology. Teleological educational philosophies of education, on the other hand, have had a much longer history in formal educational settings, though their reach in society has tended to be much smaller and more focused than their instrumental counterparts. Requiring a significant amount of pedagogical attention and expertise, teleological educational systems have
been difficult to scale *en masse*. Increasing access to education in the 19th century naturally diminished the strong teleological hold on education: both the difficulty in scaling and the increasing demand for specialized and technical knowledge worked against a systematization of a teleological educational philosophy in modern America.

There may, in fact, be no choice to make about educational philosophies. It could well be that increasingly instrumentalist practice is following a natural progression in history, affording individuals greater freedom in their education. The eroding of a teleological presence in education may well be the consequence of an increasingly 1) individualistic and 2) technological society. On the first point, it should be noted that individual freedom is, on the face of it, increased in instrumentalist education by virtue of its opportunities for more varied program choices and a larger role in shaping and initiating education programs. Arguably, however, these apparent freedoms are meaningless if the terminal consequences of the program are such that individuals become *enslaved* to their areas of specialization because their focus was too narrow. Worse yet, individuals educated for specific proficiencies may be enslaved to states of political ignorance and futility by their lack of understanding of the nature and the inherent responsibilities of a democracy.

The possible consequences of an increasing or exclusive implementation of an instrumentalist educational philosophy are severe
enough to warrant a reconsideration of our philosophical alternatives in educational practice and to question the inevitability of instrumentalism. Through further exploration of the way in which the technologies of the 19th century, which seemed to foster instrumentalism in education, resemble or differ from the technologies of today, we will better understand what choices lie before us and what the possible consequences are. In so doing, we will be better positioned to make a conscious choice about the appropriate philosophies of education for the development of a responsible, productive and reasoning polity, essential for democracy.

The History of Chosen Philosophies of Education

Teleological and instrumental philosophies of education have served very different social purposes. Teleological philosophies of education have been implemented historically in settings in which education for a liberal thinking and general skills is the primary purpose. In general, teleological philosophies of education held their tightest hold on higher education when only a fraction of society was served by it. At these times in history, the economies were such that the demand for well-rounded intellectuals was small, but warranted the formation of academic institutions.

Instrumental philosophies of education have been adopted, on the other hand, in settings in which the goals of the education process have been specific, initiated largely out of students' interests, or pragmatic, in response
to a demand in society for a new knowledge set or skilled workers. The two philosophies emerged historically in what seemed to be natural responses to the evolution of society, specifically with respect to the demands placed upon the workforce. The teleological scenario fits well with an economy in which most members of society do not require formal education; the work demands are not so great, and the technologies are not so sophisticated. Yet, a fraction of the population must be prepared to speak broadly on all human issues and legislate for them. Teleological educational institutions served these individuals. The latter scenario conjures up an image of a situation where the demands placed upon all members of society is such that training is required for nearly all positions; this follows from the development and ubiquity of sophisticated and complex technologies.

When this country was founded, there were no institutions of higher education waiting for new immigrants to enroll. When our country's founders built the first American colleges, they could have emulated a number of different models ranging from the professional schools in Europe which that an apprentice model, to the monastic schools, which existed primarily for the purpose of reproducing manuscripts.\(^{163}\) The model chosen,\(^ {163}\) See David Nicholas, *The Evolution of the Medieval World: Society, Government and Thought in Europe, 312-1500* (Longman Publishing, New York, 1992) for a fuller explication of the social, cultural and technological developments of this period.
however, was that of our forefathers in England who regarded education as the means to socialization, good manners, and proficiency with the language.

For two full centuries beginning with the formation of Harvard College in the 1600’s a teleological philosophy dominated higher education in the form of the liberal arts college and provided the basis for the public school system in the mid nineteenth century. An instrumental philosophy of education began to formally infiltrate higher education with the birth of the land grant colleges or “ag schools” as they were more commonly known as in the 1840s.

Since the founding of our country, agriculture monopolized more than ninety per cent of the US gross national product. By the 1840s, the technological complexity of the agricultural industry required the development of highly technical and specialized schools in order to meet the social demands in sustaining the economy. The formation of ag schools in the mid 1800s was the first formal affront to the role of higher education as a means to socialization primarily and forecasted the declining influence of the liberal arts colleges.

Liberal arts colleges held their ground in both numbers and their role as the pinnacle of higher education for decades after the ag school’s inception. However, as society became more technologically complex with the invention

of a mass rail system and electronic forms of communication, new schools were created to meet the demands of a changing and more technologically sophisticated economy. For example, the training of physicians transformed itself from an apprentice program to one of the most rigorous and esteemed professions. Its metamorphoses coincided with the advances in science and technology that multiplied the technical skills and specialist terms required of a physician. Medical schools were but a small part of the changing landscape in higher education in the 1800s. Altogether new kinds of schools, degrees and programs were introduced in response to entirely new fields of knowledge. The catapults for the massive changes in higher education were primarily advances in science and technology. The changes in higher education were largely byproducts of a much more invasive change in the culture and ultimately economy in the US in the 19th century.

Agriculture had seen its heyday in the 18th century. The farming “industry” that had dominated the US economy for several hundred years dwindled from 93% in 1820 to only 20% by 1880. Shortly after the Civil War, in 1869, farm goods accounted for nearly 40 percent of US gross domestic product. By the end of World War I, the farmers’ share of national output had

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fallen to 14 percent. Today, it is 1.4 percent.166 With the shift from agriculture to industry and from farm to city, whole new businesses appeared. Today only 3.4 Americans work in agriculture, 2.8 percent of the labor force, and even that tiny percentage continues to fall.167 The growth of a manufacturing economy usurped the power held by agriculture and farming and diminished its hold on the US economy.

Higher education in the 1800s was born out of a need to educate individuals for capacity with new forms of technology and an increasingly complex nation. The "nation state" itself became a term used only after the invention of a mass rail and communication system168, which seemed to unify states in a way previously impossible.169 These technological advances (or inventions, if one prefers less progressive terminology) afforded individuals the opportunity to travel long distances from home to attend college. Higher

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167 Ibid.

168 Much has been written about this period in American history. My explanations are general because my focus is more on the specific institutional developments rather than cultural and technological chance. For an excellent look at how the technologies helped shaped a culture of nationalism, see Benedict Anderson, Imagined Communities: Reflections on the Origin and Spread of Nationalism (London: Verso, 1983).

education became more and more competitive internally, and most institutions opted to differentiate themselves from their competitors through increased specialization.\textsuperscript{170} This kind of specialization traversed all disciplines including the arts and humanities. Not surprisingly, however, as science and technology were the incubators for new knowledge in the 19\textsuperscript{th} and 20\textsuperscript{th} centuries, the new fields of knowledge were overwhelmingly scientific and technical in nature. Consequently, science and technical schools held fashion and number in their favor in the early 20\textsuperscript{th} century. And the world wars only increased the importance the scientific and technical innovation held for our country and consequently on higher education.

Some hold that it was in this period in education history in the US, between 1850 and 1950, that education truly became democratic. The lofty goals of educating for a cultured and socialized citizenry held by members of the liberal arts colleges were pertinent or useful to only the few who could afford to take a leisurely approach to education. For those who looked to education for the acquisition of practical and productive skills, the arena had opened widely. And higher education, for the first time in history, could make very real contributions to the solving of social dilemmas.

Liberal arts colleges, once the sole and for a long time the most eminent, category of institutions in higher education, now represent only a small portion of all of higher education. The teleological philosophy of education has all but surrendered its influence on higher education. Secondary schools have always taken the lead from higher education and usurpation of a comprehensive and general liberal arts education for a more practical and specialized one is no exception.

Our society has become increasingly technological and has demanded of its citizens adeptness with some fundamental communications tools to function in the workforce. Vocational and technical educational programs help satisfy the need for capable workers in industry. As the technologies become more ubiquitous via wide area networks and more sophisticated, the development of more technical and instrumentalist methods of education seems like a natural response in educational reform. We are faced with an increasingly important question: If a more instrumental method of education means that more people can become more productive in society through education and that they will be more prepared for "work", then is this not the smarter choice in a democracy?

The intuitive response to the question of whether an increasingly discrete, technical and instrumental method in education is superior may well be a resounding "yes". Most universities and colleges are increasing financial and intellectual resources to science and technology programs, decreasing
them to the arts and humanities. These same colleges and universities are planning for (if not already implementing) degree programs online in which students would access only the materials they need to complete the requirements of the courses and personal interaction and discussion with other students are ancillary to the course.

We are most definitely in a state of rapid technological development in the US. If this development is a mere extension of the kind of development that occurred in the mid 1800s, which resulted in a major shift from an agricultural to a manufacturing economy, then a mere expansion of the instrumentalist and technical methods of education initiated in this period may well be appropriate for our time today. However, there is evidence that implies that the technologies of this generation differ radically from those of the previous Industrial generation, and as such require a different response in educational reform.

An Industrial Economy and the Demands on Education

Industrial is the term that best captures the economy and culture of nineteenth and early twentieth century US. It was a time characterized by manufacturing plants, power tools, and assembly line work. The most important changes brought about by the Industrial Revolution were 1) the invention of machines to do the work of hand tools; 2) the use of steam, and later other kinds of power; and 3) the adoption of the factory system and
mass production. Before the Industrial Revolution people had no such products, and were forced to use their hands for many of the routine tasks like getting water, darning a sock, or heating a house, that we take for granted today.

Mass transportation systems afforded individuals greater opportunities for travel and re-positioning one's self in a new environment for career and environmental reasons. Improved communications systems made the move away from home a more comfortable one. In addition, consumer goods could be much more easily transported, reducing the need for self-sufficiency in localities. The city began to emerge as an important location for business and the sale of goods, yet almost no products would actually be grown there. The nature of new industry was largely product oriented. Some sectors were geared towards producing staple goods more efficiently. Large farm machinery served this end, for example. Other sectors developed entirely new industries and capitalized on the potentials of the new technologies and the scientific and technical knowledge acquired in their development.


The automobile industry is an important example of a product-line business that thrived throughout the Industrial Age which could both not have been possible without the technological and scientific advances of the age and capitalized on the unique advantages of a manufacturing economy and the technologies of the age. The auto itself was powered by invention of the engine. The assembly line process did two important things: 1) allowed workers to specialize in the use of specific tools that extended human capacities for building and manual labor, and 2) by segmenting workers' responsibilities, the process of production quickly became a mass endeavor.

To succeed in this environment, workers needed primarily to manage proficiently with particular tools and processes. The specific functions of particular tools enabled workers to focus in detail on segments of the production process. The specificity also discouraged workers from taking too broad a perspective on the product as a whole. The education necessary for manual, managerial or research and development roles within the Industrial Age followed the same pattern: specialized and technical.

What is interesting, too, especially as one begins to make comparisons to a digital economy or Information Age, is that in an Industrial economy, the worker has a well-defined relationship with the end product of his or her creation process. That is, the worker in a manufacturing plant acquires the knowledge to use a new and complex power tool that automatically puts widgets in cars. The process is the same (or reasonably so) every time he
positions the widget, and the object itself has little or no mark of the worker's individual intelligence. Rather, most of the work in an Industrial economy is rote, and innovation occurs with the development of new tools, but not in the implementation of the new tools.\textsuperscript{173} An Industrial economy forges a relationship between workers and their products that ends with the creation of the product. The knowledge that the worker uses to create the products is transferable to the development of other products, but is largely constrained to the details of a concrete or finite end.

The Industrial Revolution refers to the general effect of machinery upon humanity. Our entire way of life, as citizens, workers, and consumers reflects the influence of the Industrial Revolution. Our schools and educational programs began to reflect—in a cumulative process of reinforcement—the attributes valued by one age including the increasing focus on discrete and specialized knowledge and more technical and applied ends than ever before in education. More schools had opened their doors than ever before in the period of the Industrial Age. There was an increasing shift way from general liberal arts colleges and a shift towards more scientific, technical and specialized knowledge production. The pinnacle of the

scientific and technically focused institute in higher education is the research university where financial, organizational and intellectual resources are focused on the production of new knowledge and teaching students is a secondary role at best.

Digital Technologies and the Transformation of Supply and Demand in Education

It is not my intention to go into the complexities of every labor job and detail how our economy is clearly moving from the industrial to the digital.174 Rather, by examining the differences between the industrial and the digital in general terms, and relying upon the transition as a metaphor, we will better situate ourselves and our educational institutions for the changes made possible by a digital information system.

It is important to understand that what is now understood broadly as the Industrial Age came to be only after a series of technological, institutional and economic conditions were put in place, slowly replacing a way of life wholly tied to agriculture. The Industrial Revolution created wealth in new

174 There are many great historical works on the subject of economic and cultural change in the US in this period. The works that look philosophically at the subtle differences between the previously held technologies and those that look more like informational and computer technologies are much fewer. For an insightful look at the subtleties of a computer culture, see Patrick Boyde, Turing's Man: Western Culture In the Computer Age (The University of North Carolina Press, 1984).
ways. The Industrial Age began with the invention of machines, which could extend and improve upon the capacities of any one individual. The mechanization of the American labor force in conjunction with the process of mass production characterized the Industrial Age and situated the economic power of the US in mills and factories. The telephone and telegraph facilitated the opportunities for human communication, but the inventions supporting mass product development, including steel, automobiles and other textiles typified the Industrial workplace. For the past few decades, automobile manufacturers and gas companies have dominated the top ten companies in the US.

The Information Age is quickly and forcefully replacing the Industrial Era, which tied our consumer and employee base to the development of products.175 The industries thriving are those that specialize in information technologies. The number of public offerings has reached an all time high, and the Federal Communications Commission (FCC) credits this to information technologies exclusively.

The Information Age promotes a different kind of relationship between workers and employers and clients, consumers and knowledge workers than the Industrial Age did. Every worker in the Information Age is

a knowledge worker. Every employee in an information economy is responsible for managing information, acquiring, organizing and interpreting, the information. The product is a knowledge product and in its malleability 1) means that the knowledge never actually leaves the worker, and 2) requires that he customize it to the client or consumers needs. This second point accents the important relationship that workers have with their clients and the important role that knowledge plays in affording the worker the capacity to act for the client. Knowledge and action are integrally related in an Information economy.

I use the term Information Age to connote what distinguishes this era from the previous era. I hesitate to use the term because the distinct nature of human beings is such that we are most human when communicating, producing and consuming information. While our work may not have allowed us to cultivate or utilize this capacity, it is my own opinion that ours has been an information age as long as it has been a human age. What distinguishes this current age is precisely the way in which information has become accessible to all members of society in their work, education and leisure activities. The malleability of information is a consequence of what I would deem the digital in contrast to industrial. Furthermore, the digital characteristic is what liberates individuals from the focus on product

development to the responsibility of problem-solving through knowledge production. Consequently, both conceptually and actively the activities of doing and thinking are united.

Before the foray into the meaning of a digital information age begins, it is important first to consider what is meant by the technologies of information and the role that they play in general society and in our schools, the primary hubs for education. Information is projected, implied and contained within every object, personal or public. The Louvre, the Eiffel Tower, Chartres Cathedral all are objects that connote enough information for entire dissertations to be written on them. As important objects of our culture, each is often studied or referred to in history, art and architecture and cultural studies courses. Very few teachers plan to take students to the respective locations of the great museum, monument or church. Some would argue that the original artifact is the ideal place to study an object. I would disagree. Though such pilgrimages or visits can be important components of the study process, they are incomplete insofar as exact simulations actually give the student-scholar the advantages of being able to measure or analyze components of the original, which would be impossible in real time and space, for example. The point, of course, is moot to a large extent because the facts of education are such that educators, scholars and experts rely upon
information about artifacts of our culture, not the artifacts themselves, all the
time to teach and study.

The discussion that follows is based upon the expectation that the bulk
of information that is shared amongst members of society, in particular in the
processes of education, is

1) secondary to the extent that it is not the original object, and
2) available for discussion as information because of some information
technology.

The alphabet (in conjunction with all the other tools like papyrus and
ink that gave it potency to concretize ideas and disseminate and produce
information), the printing press and the World Wide Web, all are means to
making the information essential to study and teaching available. The
technical characteristics of digital information technologies themselves are
perhaps less important than their general characteristics and their use as a
metaphor for imagining the implications and general characteristics of this
"information age". "Digital" is itself a term which was invoked to do two
things primarily:

1) Distinguish itself from an analogue method, and
2) Promote its organizing principle for information, digits.
Analogue technologies imply that the information about an object in electronic form is a close representation of its original referent (it has an analogous relationship), be it electronic or genuine artifact. An original referent is the marker for the quality of the information as replicated via analogue technologies. The printing press was clearly an improvement upon an earlier process of duplication by individual scribes who copied manuscripts (usually copies from another copy themselves) by hand. Print machines systematized the duplication of copies of manuscripts and decreased the possibility of human error. The margin of error was greatly reduced in the production of copies by the printing press. However, the machines varied, and inevitably types or fonts would erode with time and imperfections in the printed manuscript arose and were mass distributed. Therefore, even the printing press left the margin of error considerable. Consequently, the printing press enabled more members of the population to "consume" information, yet, also assured that more members of the population would be privy to errors when they occurred. The printing press is something of an archaic example, but is a particularly emblematic one. Dozens of other contemporary analogue technologies exhibit the same phenomenon. For example, in analogue video production, the term used for the cumulative inexactitude in successive duplication is "generational decay". Second generation copies will always corrode in comparison to the original. En masse, the imperfections escalate and quantify.
In many ways, the printing press as an example of an analogue technology represents the age-old conundrum of democracy: How to develop both tools for promoting equity as well as excellence? In this case, how to actualize opportunities for access to excellent information resources in mass quantity? If we really are embarking on a digital information culture and economy, the ways in which we organize and share information are critical to our capitalizing on its potentiality in general and to our surpassing traditional expectations of exclusivity between doing and thinking. In order to reach our potential for both democratizing the general culture in this revolution as well as the educational systems we create for our budding citizens, we must work to attain both equitable access to information and excellence in the quality of information available.

Tools of Information Production, Consumption and Distribution and Our Progressive Capacities for Democracy

Insofar as information technologies are tools essential to the process of cultivating the capacity for reflective and active citizenry in our youth in formal processes of education, it will be useful to look at the tools for information production, consumption and distribution throughout history. In approximating the ways in which the dominant tools for information production impacted on both the excellent quality and equitable access to information, central to the process of education, we will better understand
our alternative and optimal strategies for utilization of the emerging digital
technologies.

Recognizing that the tools that allow for the consumption, production
and distribution of information are essential to, but not equal to, the
educational process of turning that information into knowledge, the
following historical analyses of the tools of the "economy of information" in
education is only part of the story. However, by unpacking the technical
capacities of the tools for facilitating the production, consumption and
distribution of information, we will better understand the educational
tendencies and possibilities of these technologies.

In what follows, I have organized the dominant and most influential
technologies used for information production, consumption and distribution
in formal educational settings (see table 1). Roughly, the term "production"
should connote the capacity of entire systems and individuals to produce and

177 While my use of these economic terms that follows is perhaps unusual in
its application to specific technologies and their relationship to such
qualitative terms as "equity" and "excellence", the notion of understanding
educational institutions as information production centers is not. In some
instances, the categories are meant to be reductionistic. In others, like my, the
categories are merely meant to provide a schema by which to better
understand the institution as a whole and unpack complexities. For a more
comprehensive look at what it means to be an information production center,
see the following: Michael Gibbons, The New Production of Knowledge: The
Dynamics of Research and Science in Contemporary Societies (Sage, London,
1994); Fritz Machlup, Knowledge: Its Creation, Distribution, and Economic
Significance (Vol. I and II). (Princeton University Press, 1982); Fritz Machlup,
The Production and Distribution of Knowledge in the United States (Princeton
author "information objects" (these have been predominately text documents throughout the history of schooling). Students are required to produce an information object as a test of their capacities. Individual authors contribute information objects they produce to their fields of study. Disciplines rely upon the availability and expertise exhibited in some canonical information objects. Information "consumption" refers to the methods by which students and communities of scholars receive or consume information in pursuit of knowledge in their studies. "Distribution" refers to the means by which information is distributed by instructors and the discipline as a whole to its specific students and society in general. This distribution then suffices as a means for documenting and disseminating its disciplinary achievements publicly. The variable "excellence" is used to assess the quality of information insofar as it represents an original information artifact fully and accurately. The variable "equity" is used to assess the availability of the information to all members of society. The first is a largely qualitative assessment, the second quantitative.
Table 1
An Analysis of the Means of Information Production, Consumption and Distribution for Educational Purposes from 800 bc – Present

<table>
<thead>
<tr>
<th>Innovative Technology and Educational Institution</th>
<th>Production</th>
<th>Consumption</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral -&gt; Alphabet Academy Lyceum</td>
<td>c800 BC-- &gt;c400 BC</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>-&gt;Manuscript Trad. Middle Ages Colleges</td>
<td>c400 BC-- &gt;c1500 AD</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>-&gt;Printing Press K-College</td>
<td>c1500-- &gt;c1990</td>
<td>X Q</td>
<td>Q</td>
</tr>
<tr>
<td>-&gt;Digital Tech K-General Public</td>
<td>c1990--&gt;</td>
<td>X Q</td>
<td>X Q</td>
</tr>
</tbody>
</table>

X=Excellence
Q=Equity

Excellence in the production of knowledge (information) is achieved when an author has the tools available to him to express his idea with the greatest amount of precision and clarity.

Excellence in the consumption of knowledge (information) is determined by the consumer's ability to access the knowledge product he chooses in a convenient way, with the expectation that it is a reliable presentation of the author's idea, and is well within the context of its discipline.

Excellence in distribution means that speed and relevance are achieved. Whereas production and consumption evaluations were made in relationship to the micro pedagogical relationship, i.e., "Producer" is primarily concerned with the researcher or author's ability to produce the knowledge that is essential to the study process. Production is primarily a process of writing (and publishing) historically, but can begin to be understood as a process of documenting ideas with more multimedia tools. Clearly, artisans of the Middle Ages were powerful producers of information; however, I am primarily concerned with looking at the tools of production from within formal educational institutions, and images were not.
The potential of digital technics to alter methods of production, consumption and distribution of knowledge (information) are unprecedented. In some ways, the ease by which various kinds of information objects are integrated in a digital information system is its most powerful and innovative attribute. In a digital system, diverse media (sound clips, image and video files as well as text) can be addressed and called up within a singular system defined by energy attributes not material properties. The integration of non-traditional study tools, e.g., sound, video, into traditionally exclusively textual arenas has introduced a wider range of participants in the knowledge production game,¹⁷⁸ more avenues for distribution, and a more diverse population of consumers. The Internet is our most powerful example of the possibilities of a digital information system.

**History of the Internet**

The "fishnet" information system, which would later evolve into the World Wide Web, developed in response to a plea by the Department of Defense to maintain a means of communication after a nuclear attack.¹⁷⁹ The

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¹⁷⁸ Here, no slang is intended. "Language game" was the term coined by Wittgenstein in his "Blue Book" to connote the arena in which members of society share thoughts and cultivate new meaning. In a digital arena, the "language game" becomes more integrated and democratic than Wittgenstein could have ever imagined.

Department shelved the idea, which was then co-opted in 1969 by four major universities (Stanford, UCLA, UCSB, U of Utah), and email quickly became its most important function. In two short decades, the Web and digital information systems have promised unprecedented changes in the way individuals acquire an education and the way educational institutions define and structure themselves. These effects have as yet been largely unintended and changes within educational institutions have transpired vis-à-vis ad hoc measures intended to satisfy student-body requests. In times past, it could be argued that the knowledge production centers or educational institutions were not so critical to the society at-large because they served only small segments of the population, e.g., agrarian, feudal, industrial. Today, however, most members of society expect degrees from institutions of higher education as preparation for their careers or as means to changing careers later in life.

Furthermore, society mandates that all youth undergo an education in order to prepare them for skilled and reflective participation in civil society. As such, an unintentional approach to the reform of educational institutions through digital technologies will have detrimental effects systemically. I have more questions than I do answers in response to the question what such a plan for institutional reform needs to consider. However, it is clear that flawed dichotomies, like those between doing and thinking, which were more promising as practical responses to social and technical constraints rather
than actual representations of the human condition, need to be revisited in the wake of reform. Furthermore, by unpacking the essential processes and aims of the education process and democratic society rather than the inherited rituals of actualized institutions, and the ways in which digital technologies can extend these, we will improve upon rather than continue our practice towards a reflective and productive citizenry.

The technical capacities of the digital technologies are such that both excellence and equity in information production, consumption and distribution can be improved by their adoption. Importantly, the improvements can be made in parallel, thereby giving cause to believe that a democratic infrastructure for educational practice could be achieved. The development of the infrastructure and the transformation of the essential processes of education that might capitalize on these innovations in information production, consumption and distribution depend on the intentions and actions of its constituencies—students, teachers and administrators.

Institutionally, radical distinctions between doers and thinkers and exclusive dichotomies in educational philosophies for liberal arts students and more practical folks do not seem to benefit today's society or economy. Philosophically, the integration of the teleological and instrumental is a necessary component of an educational process that serves the democratic ideal of a reflective and active citizenry. No longer slave to the limitations of
previous technologies which inhibited the integration of doing and thinking and the instrumental and teleological, it makes sense to work to reform our educational institutions. In promoting an innovative structure, we might choose to take the best of what age-old educational philosophies have to offer and capitalize on the new capacities of digital technologies.

Digital Technologies and the Opportunity for the Reflective Practitioner

Institutional differentiation between liberal and specialized, general and vocational has been enacted according to teleological and instrumental philosophies respectively. These distinctions no longer apply because, as by-products of the inadequacy of previous technologies to integrate a democratic ideal with institutional practice, the polarities can be alleviated by the possibilities afforded by digital technologies. This is not to say that all educational institutions should be designed as integrated arenas that all look the same. Rather, institutions will differentiate themselves according to interests or specialties perhaps, but not according to exclusive or polar ends

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180 This term is one that is taken from Donald A. Schon, The Reflective Practitioner: How Professionals Think In Action (Basic Books, Inc., 1983). It is an important work that focuses on the ways in which professionals think in action and acquire new knowledge by acting reflectively. The notion of a reflective thinker is particularly interesting when one begins to think about how teleological and instrumental philosophies of education can and should be joined productively.
that fail to address the societal needs for active and reflective individuals in every discipline.

**Digital Dante Lessons**

The Digital Dante Project is an examination of an institutional experiment that illustrates the kind of changes that might help us achieve such inter-institutional reform. It is not meant to serve as an explicit recommendation for systemic or actual reform, but rather as an example to fuel sustained and reflective reform efforts. With the particulars of such an integrated educational experience illustrated, we can begin to understand what the value of such an institutional model is for achieving a more democratic society and how we go about achieving it.

Some will look to the Digital Dante Project (DDP) and take from it specific recommendations for practice. This is the very mistake that is made again and again with texts whose primary purpose is philosophical. This treatise is meant not to posit specific recommendations for educational policy or practice, but a set of possible courses of action for consideration as means to furthering democracy through education. That is not to say that the DDP is a trivial experiment. The DDP is remarkable for a whole host of reasons, many of which were explored in the previous chapter. Through the DDP,

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educators from public and private, K-12 and higher education, amateur and scholarly residences collaborate through it 1) to further their own knowledge in Dante studies, 2) to broaden their perspectives about Dante studies, and 3) to enrich their students' study experience. Collaborative curricular and professional development is not unique to a wide area network (WAN) environment, of course. Organizations like the National Endowment for the Humanities and the National Science Foundation have for years sponsored summer sessions and teachers-scholars fellows to support professional development in content specific domains, uniting scholars in the field with accomplished and ambitious K-12 teachers. The DDP improves upon the opportunities for professional and curricular development in a few important ways:

1) Opportunities for gaining specialized content for pedagogical purposes is not a competitive process on the Web, but is possible for all who have access,

2) Impulsive interests become opportunities for knowledge acquisition. Teachers no longer need to be "teacher-scholars" to participate in a discourse with scholars, and
3) Around the clock, unconstrained access to intellectual and communications resources make professional and curricular development daily fodder for teachers and scholars.

Thus, the DDP illustrates how WAN access and a commitment to its utilization for the improvement of teaching and learning allows us to radically re-think traditional architectural divisions between K-12 and higher education, and public and private institutions. Thus, rather than relying upon competitive strategies like vouchers and corporate-driven K-12 institutions, there is hope that a collaborative learning environment with open access to quality intellectual resources will 1) afford excellent educational opportunities and 2) make access to excellent teachers a public promise, as a minimum standard.

WAN in and of itself cannot improve or reform education. Rather the DDP helps illustrate how an open communications system provides opportunities for 1) communication amongst scholarly, pedagogical and student interlocutors, 2) shared access to content resources, and 3) a new set of tools and media resources to facilitate study. With a WAN and open access to intellectual and content resources in place, the culture of education has begun to change. To some it has meant that access to intellectual resources and accreditation is a student’s right when and how he deems most convenient. To others, in the case of the DDP example, it has meant a re-
assertion of a teacher's responsibility to stand as expert in some way, affording students and teachers alike access to the resources necessary to acquire new and excellent knowledge everyday.

The effects of a WAN system of communications and access to content resources on the practice of education are as yet only hypothetical. WAN bears significance only if the access to the system is wide. That is, access to it must be open to all members of the educational community. Currently, the digital divide is threatening the meaningfulness of a World-Wide Web because only small fractions of minority and lower socio-economic classes have access to it. Even fewer people have access to the Web with the high bandwidth necessary for sustained study with multimedia objects.

Problematically, if the mode of operations is to afford access only to those who express an interest and have a specific use for the network, then the divide will only be exacerbated. One can only be proactive and knowledgeable about the use of a WAN if one has had the opportunity to explore it. Typically, that kind of freedom and access to knowledge and resources has been out of the reach of our public institutions. However, those who are motivated by a central belief that a WAN is fundamental to the improvement of education and access to quality resources is a minimum

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standard to which all education institutions must be held *must* make wiring and infrastructure developments a main component of an educational reform agenda. With an infrastructure in place for unconstrained communications and sharing of resources, the "public" in public education will lose its malnourished connotation and private institutions can invigorate their public relevance. For those who hold that there is a necessary relationship between the flourishing of a democracy and a public education (which also entails a private education system that makes contribution to the public good), the Web and digital technologies make an important contribution to the achievement of this public good.

A philosophical stance must be taken not only as a precondition for adopting an infrastructure strategy, but also as a basis for the systemic reform in the practice of education towards a more public endeavor. That is, the ways in which teachers conduct themselves and unite in their common mission of educating for the cultivation of responsible citizens, and the way in which curriculum is developed with both a cultural and intellectual end, will be central issues in educational reform. The changes made in everyday pedagogical practice and curricular development will ultimately be the most important and the most difficult to accomplish. Even for those who have ascribed historically to a teleological philosophy of education, maintaining a political purpose as the end of education, the practice of it historically has
been limited to a fraction of individuals. WANs and digital technologies inevitably usurp the artificial constraints between public artifacts and education and provoke educators to accept the responsibilities that access to unlimited resources bears upon their own teaching and study and their students' learning environments. The kind of communication amongst scholars, amateur audiences, and other pedagogues described in the DDP, however, will be difficult for most teachers to sustain. In particular, in these early years of reform, the energy required in constructing new best practices and withstanding the pull of tradition will be enormous. Yet, it is this time of initial output of inventive energy that is crucial for laying the groundwork for reform to come. It is in these early stages that consideration of all possible alternatives is required, and passive and unreflective behavior must be challenged.

Most of us advocates of the fuller integration of new and emerging technologies in education have long ago abandoned the promise that the technologies will make the teachers' or students' work easier. Rather, the general belief is that the technologies may make our lives better. And, in the field of education, we will need to make important choices: Does better mean that students have freer and more convenient access to materials so they may direct their own access to the content and self-study materials that constitute their education? Or does it mean that educators and students have greater freedom in the kinds and quality of resources they have access to, and that
merely begins the first step in the process education? Or does it mean something new or some combination of both? If a combination, then how do we invigorate and reform the practice of education? The opportunities before us, require us to re-think the processes we have adopted heretofore and investigate what role inherited technologies have played in rigidifying both the practice of and our general expectations about education. Implicit philosophies of education must be examined and made explicit, and then used to inform the process of reform through technological innovation and procedural reform. The process must be a discursive one: practice will inform innovation and innovation will allow us to imagine changes in practice. In this early stage in reform, all methods of practice and all philosophies of education are under investigation. No method, insofar as it owes its roots/foundation to a technological constraint or a biased philosophy informed by a technological innovation, is free from suspicion. What this means essentially, is that no method or philosophy of education ought to be adopted without investigation and exploration of alternatives in a digital environment.

This treatise may have persuaded some to believe that a teleological philosophy of education is now possible and ought to be ascribed to. My intent, however, is not so much to persuade readers to accept one educational philosophy or the other. Rather, I suspect that an educational system that attempts to educate for a responsible and free civic needs to see more of a
blend in philosophies than what has been offered historically, affording more equally opportunities for freedom and value-laden curricula. I urge readers to consider the necessary relationship that education and technology have had and continue to have with one another. Without technology for its implementation, education is an impossible, private ideal. Without ideals, the technologies of education serve no generative end.

Perhaps the most important message to be taken from the DDP is the means by which education becomes fodder for exploratory research and development. The most important knowledge acquired in the experimentation with the DDP in the experimental period between 1993-1998 is

1) How much there is yet to be learned about education.
2) On what shaky ground sit most of our intuitions about educational practices. And
3) The ways in which educational institutions work with one another.

What the DDP most succinctly illustrates is that we have as yet only begun to tap the ways in which educational practice and educational institutions can be improved and innovated upon. It is clear that we have only begun to tap the ways in which digital technologies expand the kinds of action students
can take in the study process and educators can take in constructing and implementing their own professional and curricular development plans.

Through DDP some long-held assumptions about education have been forcefully questioned:

1) Educators work best in isolation in teaching their students and planning curricular lessons.
2) Educators learn all they need to know to teach in graduate school.
3) K-12 and higher education are radically separate institutions, and collaboration is impossible.
4) There is content too sophisticated for K-12 students which belongs in the realm of the expert. And
5) Content is discipline specific.

And so on. The DDP has agitated all of these aforementioned assumptions implicit in education. The DDP has given us cause to question the legitimacy of the term "K-12" itself. What meaning does K-12 have in an environment where interest more than age unites individuals in the pursuit of study? The historical analyses in chapters 2 and 3 illustrate how united technology and education are to each another. In an era when all education practice is up for grabs, our technological alternatives and methods for practice are greater than ever before, what actions should be taken? Before making choices about the kind of philosophy of education to adopt, we must begin to explore what our alternatives in practice are and what kinds of consequences will result
from them. Our forward stance must be one that makes research and development in education a foremost priority.

The Shape of Research and Development

New interest in research and development (r&d) in education has grown out of the growth in the field of new media. MIT's Media Lab is a prime example of the kinds of r&d initiatives surfacing in both institutes of higher learning and in some for-profit sectors. These initiatives will make important contributions to the development of sophisticated technologies for education and will help foster sustained interest in improving education through technological innovation and through competition in the development of "successful" and "marketable" products. These initiatives, however, do not represent the kind of r&d I refer to when I talk about exploring alternatives in education with new and emerging technologies. Rather, the r&d that I imagine and believe is so crucial for improving education assumes a couple of important things:

1) Education is a service endeavor, not a product development center. Therefore, r&d in education and technology must take as its central focus the ways in which the service of education is improved via the technologies, not the development of the tools
of production (though these may play a role in improving the service of education), and

2) Innovative tools and practices have short life spans. The investigation into new tools and practices must be inherent in all r&d, and a biased commitment to a particular tool, vendor or practice will inevitably diminish the excellence in results. Consequently, revenue generation cannot be a primary goal of innovation in education.

This kind of r&d has been the mainstay of research universities in the US for years. The notion of allocating large sums of money for the purpose of general research, however, while not new to our system of higher education has garnered little momentum in the field of pedagogy.

The notion of funding education institutions for the purpose of acquiring knowledge and innovating upon practice first acquired systemic relevance with the surfacing of the World Wars.\textsuperscript{183} The wars brought about the need to develop a capable armed force with sophisticated weaponry and

\textsuperscript{183} The range of materials on this particular subject is vast. For an extremely comprehensive and factual account, see Roger Geiger, \textit{To Advance Knowledge: The Growth of American Research Universities, 1900-1940} (Oxford University Press, 1986). For an eloquent statement on the cultural shift, see Vannevar Bush, "As We May Think", \textit{The Atlantic Monthly}, July 1945 (Low Rotunda, Columbia University, 13 April 1998).
cures for diseases acquired and brought from abroad. Uniting in their common goal of solving these very real problems brought about by war, US government, industry and research universities formed an alliance.

Our government knew what it needed, but it lacked the intelligence or the facilities to respond. Industry was a likely candidate for the production and manufacturing of warfare equipment and medical supplies, but lacked the experience in inventive design. Rather, following the pattern of the automobile industry, industry in the late 1800's and early 1900's in the US excelled at mass production; however, its creative thinking tended to be restricted to the initial stages in structuring production. The American research university, however, focused its financial and intellectual resources on the production of new knowledge. Unlike the liberal arts colleges, where the cultivation of general skills and well-roundedness in students were the foci of the institution, research universities served as incubators for talented and specialized researchers. In these, teaching took second place to the production of new knowledge through intensive research. Johns Hopkins

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184 See Lawrence Veysey, The Emergence of the American University (Chicago University Press, 1965).
opened its doors as the first American Research University exclusively for graduate students.185

The world wars afforded government, industry and higher education (primarily research universities) the opportunity to crystallize a relationship in which government became a funding source and initiator of projects that required both new knowledge and an implementation scheme or broad application of that knowledge in the production of some “thing”. Universities took on the role of knowledge center, and industry took on the role of producer and disseminator of the knowledge solutions.

Since WWII, the funding relationship between government, industry and research universities has looked something like this: A problem is identified, then government allocates monies to research universities (they often compete amongst one another) to solve problem. Research universities then work with industry to develop functional solutions to problems by translating the new knowledge into a procedure or tool. Industry partners then mass distribute the solution by marketing and selling the solution for a profit.186

185 The undergraduate college would open years later when it was thought to be a new revenue source and a means to securing students for the graduate school.

For at least a few decades, this relationship seemed to work well. Research universities strengthened the defense system, and added significantly to the general improvement of culture by its the development of new knowledge (NASA, for example). They were able to secure some important basic funding from governmental agencies for the general purpose of research. Research universities, though not set up to profit financially like industry, were positioning themselves as important knowledge production centers and incubators for innovation.

With the end of the Cold War and fewer threats on national security, the governmental enthusiasm for university research has decreased significantly. Since the late 60’s, research universities have seen fewer and fewer federal dollars and the continued decline seems certain. I cannot causally relate current university interest in the development of revenue-generating new media tools and centers to anything specific. Yet, the institutional capacity for r&d and the need for securing revenue do seem to have created some fertile ground for its development. This development of for-profit new media initiatives within the university does radically change

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the initial alliance between government, industry and higher education in the
formation of a national innovation system (NIS).

The NIS in the early 20th century was the result of some fairly well-defined social needs and core competencies of each participant. Industry and higher education retained radically distinct identities, and their roles in the process of innovation were clear. Industry developed products and higher education provided the intelligence. In an era like today the production of new knowledge in new media is facilitated by use of the tools in new media. Consequently, the processes of invention and production in new media are nearly indistinct. In addition, the new media product is typically an information technology product, e.g., a web site, a patentable computer program. Therefore, the transition from invention and production process to saleable product is much more direct than ever before. With the Web as a facile means of mass distribution, the transition is even more fluid. Thus, industry and higher education are competitors in the field of new media innovation.

Ironically, by adopting a radically instrumentalist philosophy of education, educators have all but conceded that education is a simple matter of delivering content in an efficient way to its students. Consequently, industry's crossing over to educational domains is legitimated. If education is reduced to a process of distribution, who better than an organization practiced in mass distribution to champion it?! The most severe danger in
focusing R&D in new media and education to the development of saleable products, however, is that the plight of working to better understand the central questions about education and the role technology plays in implementing the best practice of these, is lost.

We know so much about specific kinds of education. The proliferation and success of so many different kinds of educational institutions makes that abundantly clear. Information and knowledge have proven to be our most precious natural resources. Yet, we know so little about what kinds of practices and institutions serve specific and timeless needs. We can no longer afford to proceed in an ad hoc unreflective manner as we innovate on educational practice with multimedia and new technologies. In particular, we risk taking ourselves further from some basic tenets about education:

There is some necessary and productive relationship between education and a responsible civic, and

Education for a responsible citizenry requires both intellectual skills and a moral education in the meaning of freedom and justice.

And these seem to be important tenets that we, as a nation dependent upon each individual citizen's commitment to some important democratic ideals and the intelligence to implement them in action, cannot afford to cavalierly disregard.
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APPENDIX A: SUMMARY OF THE REPUBLIC, THE EMILE, AND DEMOCRACY AND EDUCATION

Book: The Republic
Author: Plato (427 BC – 347 BC)
Origin: Greece
Date Written: ca. 387 BC

Translation Used:

Re: The Republic

Plato’s Republic is the best known of his dialogues and is generally considered the greatest. The Republic is a statement on the nature of both an ideal city-state and an individual soul (psyche). The Republic unfolds in dialogue form with the positing and negating in the discourse of various hypotheses about the nature of the ideal city-state and human condition.

As the main protagonist representing Plato’s ideas, Socrates never didactically asserts definitive descriptions of the good society or individual. Rather, he leads the primary interlocutors (who are largely symbolic of commonly held philosophical positions), beginning with Glaucon and Adaimantus, into discussions aiming to define supposed key terms or concepts of an ideal city-state. Rather than conclude with a
positive assertion of his own definition, Socrates strategically negates the logic or appeal of the alternative positions held by his interlocutors.

The discourse begins when Adimantus and Glaucon challenge Socrates to prove the superiority of the just man to the unjust man. His interlocutors posit their beliefs:

Justice is "paying one's debts" (Cephalus);

Justice is "helping friends and harming enemies" (Polemarchus - Cephalus' son);

Justice is "whatever is to the advantage of the stronger" (in other words whatever the strong person can get away with - he defines his own justice) - this is forcefully argued by the sophist Thrasymachus.

In illustrating scenarios in which each of these definitions of justice proves inplausible, Socrates is left to conclude his own definition of justice (diakosune) in The Republic which is more metaphorical than it is proper justice, in that proper justice is always directed toward another rather than toward oneself. The conclusion is neither causal nor necessary, nor proven for that matter. Whether or not we choose to agree with Plato's assertions that poetry is dangerous to youth in that it may interfere with proper moral development or that people can be categorized into classes (gold being the highest, silver and bronze following), we should be cautious not
to overlook Plato's important contributions towards the philosophy of education because of his politics. Many of Socrates arguments and Plato's ideas are plausible and still prove to hold the interests of many readers today.

Specifically, Plato's *Republic* is much more than a description of what an ideal city-state or just person are. The *Republic* is a mechanism for unpacking the complexities of the city-state with respect to its dependence upon the justness of the individuals who constitute it- and vice versa. The good and just city-state can endure or evolve only if its members assume the responsibility of acting with good judgment, which itself requires the proper balance between reason and appetite in one soul. Education is the important means by which individuals come to act according to good judgment rather than brute force or fleeting desires and is the means by which the goodness and justness of future city-states are assured.

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Book: *The Emile or On Education*
Author: Jean-Jacques Rousseau (1712-1778)
Origin: French
Date Written: ca. 1762

Translation Used:

Re: *The Emile*
*The Emile* contains many of Rousseau’s most far-reaching ideas, traversing far beyond the domains of his political writings. In *The Emile*, we find a thorough discussion on how an individual can find a place for himself within society, which according to Rousseau is inevitably corrupt.

*The Emile* describes the development of a typical individual, Emile, under the tutelage of Jean-Jacques (Rousseau, himself). The manuscript is divided into five books. Their chronology illustrates the important developmental periods of the individual: Books I and II refer roughly to the periods between birth and 12 years of age; Book III, 12-15; Book IV, 15-20; and Book V, 20-25. Rousseau does consistently stress the importance of doing things (which refers to the teachers’ doing things” for the proper development of their students) in particular times and in a particular order, though this order has more to do with fulfilling particular capacities of an individual (Emile) as he holds the role of friend, lover and citizen, for example, rather than any strict adherence to developmental stages.

“Fundamental to the whole work is Rousseau’s belief that humans have an intact nature which, if allowed proper scope for development, will allow them to be useful, happy and good, for themselves and for others. It is man’s interference with the normal course of nature that makes people corrupt, miserable and damaging to themselves and to others. He announces in the very first sentence: ‘Everything is good as it
leaves the hands of the Author of things; everything degenerates in the
hands of man'…

The goal of a good education, of a life scheme that will enable a person
to remain in possession of his proper powers and to express them fully in
all aspects of his life, is to keep faith with the integrity of nature. The
disposition proper to individual nature is _amour de soi_, an innate concern
to preserve one's own existence and to have a fruitful life…”188

_The Emile_ is important as both a treatise on the cumulative
development of an individual and an alternative “student-centered”
approach to educating for the competency (both intellectual and moral) of
an individual within an imperfect society. Education is the means by
which individuals develop the competencies necessary to deflect the
power that corrupt society might have on responsible and healthy growth
as well as the means to combat corruption in society and work towards
the development of a more just and civil state.

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Book: _Democracy and Education: An Introduction to the Philosophy of
Education_
Author: John Dewey (1859-1952)
Origin: American
Date Written: ca. 1916

Re: Democracy and Education: An Introduction to the Philosophy of Education

In this pivotal work, Dewey describes how progressive educational ideals best fit the needs of a democratic society-in its reality and ideal. Education plays the central role of preparing students-citizens not only for the role of adapting to democratic society, but improving it. In order to prepare students for their social roles, the classroom must be viewed as a social environment where learning is achieved through doing. As such, the educational process will achieve its mission of cultivating both the active and intellectual capacities of its citizens. For Dewey, more explicitly than most philosophers, the individual has a responsibility to be both thoughtful and reflective in society as well as actively involved in promoting its growth towards a more ideal democracy.
APENDIX B: COLLEGIATE DIGITAL DANTE EVALUATION

An informal evaluation by Marianne Bakia in collaboration Jennifer Hogan

I. INTRODUCTION

The Digital Dante project is a long-term effort to develop and prototype a versatile on-line, academic resource suitable for study in the humanities. Specifically, Digital Dante demonstrates the plausibility of a digitally created, multimedia world — analogous to the world that Dante creates in text — bolstered by the communication tools available in a networked digital environment. Digital Dante has become both a stand-alone, academic resource for scholars and a curricular resource for teachers in both K12 and higher education. Constructed to blur the boundaries between students and scholars, Digital Dante gives the student access to scholarly resources and places the scholar in contact with diverse students via electronic bulletin boards and email. As part of its design and intention, Digital Dante is also a portal through which users have access to the wealth of relevant resources available elsewhere on the World Wide Web.

As an academic resource, Digital Dante has much to offer: two English translations of Dante's Commedia, one by Allen Mandelbaum, one by Henry W. Longfellow; the original poem in Italian; illustrations by Dore and drawings by Botticelli, scholarly articles about the poem; access to the Dartmouth Dante database, various web resources on Italy, other Italian works, and to works tangential to understanding the comedy are all available to anyone with an Internet connection and web browser. The Digital Dante site has its own search engine, allowing readers to search the text of the poem, as well as a number of scholarly texts. Student work is also beginning to be included. Access to experts via email further adds to the type and quality of resources available.

The developers of the Digital Dante project wanted to create a model for curricula that bridges the traditional chasm between K-12 schools and higher education. As a result, the Institute for Learning Technologies joined the Collegiate School, an all-boys private school located on the upper West Side of Manhattan, to explore how Digital Dante, and the various networked technologies that it employs, might enhance an otherwise traditional high school humanities course, and how its use would be affected by the real-world financial and administrative constraints facing many schools today. The teacher did not include Digital Dante in his lectures, nor did the students spend most of their regular class time at the computer. In fact, few alterations were made in the traditional "English" curriculum: the teacher lectured for 4
of the 5 days a week that the class met, and the students were brought to the library for the remaining one class period a week to do research for their final papers. Although Columbia donated Internet access to the school, the project did not rely on additional institutional support. School staff, while eager to learn, had little experience with computers. Digital Dante was introduced as an additional resource in the school library. Neither the teacher nor the library staff received any specialized training.

Circumstances such as these are faced by many schools today. At the center of this trial use of Digital Dante were questions about usability within such school structures. Which materials and functions would they find most useful? Was the site effectively designed? Were relatively unsophisticated computers and connections sufficient to take advantage of networked resources? John Beall, Dean of Faculty and English teacher (then Chair of the English Department) at Collegiate, set the following curricular goals for the use of technology in this particular project:

• to introduce students to email, the WWW, and the resources accessible by using the Internet, thus providing students with research methodologies likely to be useful in future academic pursuits;

• to augment the material available in the school library through an open access, digital "reserve" of resources — with particular interest in providing access to obscure scholarly articles and the ability to pose questions to scholars at Columbia; and

• to use multimedia capabilities (primarily still images, although an audio reading of the Comedy will be available in the future) on the web to pedagogical advantage.

This first classroom-based implementation of the Digital Dante project also took important steps toward establishing a model for involving advanced scholars in a K12 curriculum. A graduate student at Columbia was hired to field queries from students sent via email to the Digital Dante site. (This access was in fact one of two favorite features noted by students in the course.)

This "working paper" details the lessons learned from the first year of the Digital Dante-Collegiate project. Although surveys and interviews were employed as part of the research methodology, the aim is not a rigorous evaluation study but to reflect on the process of introducing prepared, networked resources into one particular secondary school course. (See Appendix B for a detailed description of the evaluation methodologies used for gathering data for this paper.) This paper is organized to highlight both what happened at Collegiate and what a model for an integrated, networked
Humanities curriculum might be. Section II: "About the Dante Project at Collegiate," offers a detailed discussion of the implementation of the project and begins to flesh out what advantages teachers might expect from using Digital Dante in their classes.

Since this first implementation in a school environment, Digital Dante has been redesigned in response to the needs and desires of the teacher, students, and scholars who used it. When possible, the participant feedback that prompted these changes will be highlighted. The third section, "Findings," evaluates the type and scale of effects for participating students, instructors, and administrators. The fourth section, "Models for Future Practice," offers hypotheses about which scholastic environments might maximize the advantages offered by networked multimedia. The final section, "Conclusions," summarizes these points and offers a broader look to the future. We hope this paper will contribute to an understanding of the process by which teachers increase their ability to integrate into their classrooms the remarkable resources that digital technologies make available.
II. About the Dante Project at Collegiate

The oldest school in Manhattan, Collegiate has deeply rooted traditions, including a strong commitment to providing a classical humanist education. Like many schools of its kind, it introduces change with caution. In the absence of many compelling examples of the ways new media can enhance classical humanistic activities, the school has not built a robust electronic information infrastructure. Therefore, despite the affluence that might be associated with an elite private school, Collegiate's technological resources are somewhat typical.

The computers used during this project were of the type commonly found in schools across the country. Students accessed to the Internet on 6 terminals located centrally in the Collegiate library. These computers were MS Windows based with 28.8 modem and were the students' only opportunity for connecting to the Internet from school. In addition to the research days scheduled during class time, students had access to the networked terminals in the library throughout the school day. The students thus had simultaneous access to traditional resources and the networked Digital Dante site.

Because of the ubiquitous access to resources theoretically made possible by networked technologies, it was hoped that students would have an "open reserve," one where they could have access to advanced scholarly resources not otherwise available to high school students as well as ready access to course materials wherever they might be. Students had access to contributions from the most advanced Dante scholars, Dantisti, as well as papers from other secondary school students through their use of Digital Dante. Materials related to the course, including works by the teacher and the course syllabus, were made available at the site. Says Beall about the importance of an open reserve:

"The problem with the traditional form of a 'closed reserve' -- where teachers compile a certain number of research materials and secondary sources, store them in a library as a central place for students to check them out on a limited basis -- is that students are in competition with each other for finite information resources. They can only use those resources at restricted times, and they may not be able to use the resources when they want to. The advantages of a digital library, which essentially is what the Digital Dante gives one the opportunity to construct, is that anyone with a computer a modem can gain..."
access to the materials at a time, and they are not in competition with their peers because the materials are stored digitally and can be retrieved by multiple users.

In addition to expanding the number of resources and the times these resources are available, this web-based project afforded the opportunity to incorporate various media on a single platform. Beall felt confident that multimedia resources could play an important role in his teaching of the Comedy. Says Beall,

I think a second objective, which probably was a little bit premature in the early stages is to make use of the capacity of storing multiple types of information, that is to say, audio and visual information, that could enable one to do everything from a side show to ... at the click of a button ... present the sound of the poem in Italian. Since I'm teaching the work in translation, to have the sound of someone reading the poem in Italian in the middle of teaching the poem in translation is a great benefit.

While the advantages of this integration seem clear, financial constraints have prohibited the addition of audio files to the project at this time.

Once a week, in-class "research periods" were set aside in the library for students to research their final papers. The thirteen boys who participated in the English class that incorporated Digital Dante did not have exceptional experience with new media. Prior to the introduction of Digital Dante, students were primarily novices with regard to networked telecommunications, with the exception of one student in the course who was a web-developer and technology-based entrepreneur. Most (75%) did not have access to email or the Web at home. To make sure students could effectively integrate digital resources, students were introduced to the web during the first research day. At this time, students were taught how to log onto the computers and previewed to the Digital Dante site. The resources available through the Digital Dante project (e.g. search engine, translations, the library) were explained. For the remaining library days (about 5), students were encouraged to make full use of all of these resources -- the regular print materials and the computers. The research periods were unstructured. Students could roam the library freely or sit at one of the available computer terminals for access to Digital Dante and the web. Librarians and a technical support person were available to assist students with their information searches.
III. Findings

During this first implementation of Digital Dante, researchers sought to build a foundation of knowledge that would inform and direct future implementations of Digital Dante. Questions were broad and far-reaching. Would the introduction of networked technologies to the school require substantial external support? How could students' initial reactions to the web be characterized? Would students find the design of Digital Dante intuitive? Was Digital Dante an effective research tool? The most notable findings are described below in each of the three subsections to follow: A. Access, Exposure and Training, B. Technical Support, and C. Pedagogical Implications.

A. Access, Exposure, and Training

The Digital Dante-Collegiate project provided students hands-on experience using technologies that, as the teacher noted, "Are likely to increasingly become a part of the college experience in the very near future." In this regard, the location of the computers appears to have served the needs of the project. While about 75% of the students agreed or agreed strongly that they had "ample opportunity to use Digital Dante," 25% of the students did not agree. As one student explained during an interview, "Some days I found there was more access and some days it was really hard to get on."

Students generally had little or no exposure to networked technologies prior to their involvement in this project. As such, the first objective of the project was to provide them with exposure to and training on the web through their use of the Digital Dante web project. As described in the previous section, the first "research" day was spent introducing students to the technology. As one student noted, the orientation helped him "feel a bit more comfortable." He added, "Just the fact that I went there, and I know that I can do it again, and I can explore, and it's not going to kill me or blow up my computer (which in my mind seemed like a definite possibility when I went on there) is a big step." However, project facilitators may have overestimated the expertise students had using computers and accessing the web. Two of three students suggested in interviews that a more comprehensive introduction would have been helpful. In future implementations, project heads should take time to assess the experience of students prior to the commencement of the project to determine how much training students will require.
B. Technical Support

Just as this was the first introduction of Digital Dante in a classroom setting, this project represents the first curriculum at Collegiate to take advantage of Web-based resources. Given these circumstances, there were surprisingly few technical glitches to be overcome. Library staff assumed the brunt of technical support, and they were able to tackle most of the common difficulties that arose. They embraced the Internet as the informational resource that it is, and thus, the networked computers assumed a natural role in the library, and the librarians were able to affect greater change in the classroom as well. In addition, some of the more technologically experienced students were able to “pitch in” when needs arose, fostering a sense of collegiality and a common sense of purpose among staff and students.

C. Pedagogical Implications

Of the 13 students who participated in this project, few had the "a-ha" experience. Most students did not report that the use of Digital Dante was an effective use of their time. (The median response to the question, "Using Digital Dante was a productive use of my time" was 2.) The effect for at least a few students was that academic study became more meaningful and rewarding. Those who became most engaged were also those who found ample resources on the topic that interested them, either at the Digital Dante sire and/or on the web. Other students found it difficult to find information on their particular topics, and these students were less inclined to find Digital Dante useful for their study. The Digital Dante developers expect that with a curriculum specifically developed to exploit the site's resources, and those of the web more generally, more students will respond with this kind of enthusiasm.

It may also be that many students had not been encouraged to immerse themselves in a wealth of information and to formulate questions relevant to the material and their personal interests during their prior scholastic experiences. If this were the case, these students would not have the skills necessary to develop focused scholarly questions or to integrate various resources into a coherent project. Such students might be more accustomed to being walked through the research process, rather than being left on their own to engage in research. Future curriculum developed around Digital Dante might help students reflect on the academic research process.

The nature of the Web often allows for inquiries that cross traditional boundaries. With the additional resources afforded through Digital Dante
and the web, and with about 20% less lecture time, students had the time to browse a greater amount of material than is ordinarily possible. The students had opportunities to explore the "focal content" from a variety of perspectives. Two of three students in interviews suggested that this wider access to information influenced the choice of topics for their paper and increased their motivation. Says one student, "The topic I picked [for my paper] I picked because of Digital Dante. ... I was really psyched that I picked that and that I had all this Digital Dante stuff to look through because I absolutely loved my topic, and I know it wasn't something I would have picked otherwise." Another student agrees, "It was really helpful for my topic which was Dante and the role of language and how technologies affected distribution. ... I used the web almost entirely for the project." In interview, one student elaborated on these benefits by comparing this course to more traditional classes:

[W]e sit in the classroom for 45 minutes for 5 days a week usually, and we look at someone, however interesting they might be. It's so directed: like in math class you go through the formulas, there just isn't much looking to the left or the right, it's just going straight ahead ... . Digital Dante made the course a lot broader, because you're not following a book and it's obvious linear progression and you're not just following — following however good a teacher is usually — his way of going through the material. ... With Digital Dante you got to stop and smell the roses and check out the scenario, not even just Dante, but we looked into medieval armor — or something completely bizarre — which you’re not expecting to find out about Dante — you’re able to look at all these other great authors — before him, and after him, the art of the period, the religion of the period. Their clothes. Their battles, and so the great thing about Digital Dante is that it was able to enlarge the course.

This interdisciplinary approach enable by Digital Dante made course material more interesting, more memorable, and more meaningful to students because it contextualized content. This necessarily creates a greater opportunity for student enthusiasm for learning and the project at hand.

The use of new media technologies in the class stimulated discussion among students and teacher about the teaching and learning process. The
teacher pointed out that students had a thorough enough introduction to the web to discuss its pedagogical implications:

[W]e had a really fine debate essentially in class for a full period about whether or not Digital Dante was enhancing or detracting from the process of their learning. And I think that question led to a whole range of opinions expressed about modern technologies, traditional humanistic values, and education. So I think that the exposure to the technology thus far gives room and space and encouragement to ask questions about the best way in which learning occurs.

In classes less open to innovation, discussion of the nature of learning may be rare; the use of non-traditional resources appears to occasion the reflection about much that is ordinarily taken for granted by teachers and students alike.
IV. Implications for Future Practice

Teachers face a tradeoff when they integrate network technologies into their curriculum. A teacher who uses the web as a primary content provider has less control over the material that students are able to review and the order of content presentation. Hence, the interests of the individual students are more likely to direct the study. Teachers who successfully integrate Digital Dante are likely to be comfortable with interdisciplinary study, collaborative work with their peers (as no one teacher can be an expert on everything), and be willing to manage a decentralized curriculum.

Beall used Digital Dante with eighth graders shortly after he finished his work with eleventh graders. During this second experiment, he also found that the web increased the potential for interdisciplinary work and collaboration. Beall explains:

We worked together -- two English teachers and a history teacher who were teaching all of the eighth graders. We had agreed to treat the major project due in the spring as a joint research project. Students did research in the history of Dante's time and applied that knowledge. ... [For instance] one student worked on guilds and wrote a short story based on the research.

More traditional scholars might argue that there are valuable lessons to be learned by the student who must aggressively seek out rare information from a variety of sources --that a site such as Digital Dante makes research too easy. To this Beall responds:

While you can argue there is a lot to be gained by having a student ferret out the material at the New York Public Library, I would be willing to trade that for having that kind of material only accessible to advance scholars accessible to secondary school students. The easy access can lead to their spending more time grappling with the interpretive issues and the issues of why this poet is important to Dante ... and then have a scholarly source where that point is discussed. There you have the opportunity for secondary students to be part of a community of scholars in ways that aren’t normally our concept of what secondary students do but I think it’s something they are perfectly capable of doing.

Given some of the advantages cited earlier, and the limited numbers of students who embraced the Web-based activities, new models for curricular
use must be found to make it more likely for most students to maximize the benefits of projects like Digital Dante. Says Hogan, "Fundamental curricular and organizational innovation needs to occur for WAN curriculum to be fully exploited." Changes in the school administration and environment are likely to be a necessary step. Literature on educational technology often includes suggestions for changes in the administration of schools — longer class sessions, more collaboration between teachers, and interdisciplinary curriculum — that make technology even more effective. The Digital Dante-Collegiate experience reinforced the importance of these reforms. In the following passage, Beall shares his thoughts on the effects of technology on traditional practice based on his experience with the technology thus far:

I think ready access to the hardware is one important step a school can take. Something I have given some thought about because at Collegiate we are about to switch our schedules so that instead of meeting 5 days a week for 40 minutes, we’re meeting 4 days a week, one of which is an elongated period. ... Larger blocks of time are really needed [when using the technology] because the time required to start up and shut down the systems can be a fairly significant piece of a 40-minute period. That might leave only 20 minutes of real time, and that might not be enough for the kind of creative thinking and searching that his technology may make more a part of the students' learning environment. It certainly can change the entire structure of the relationship between student and teacher, where the teacher becomes much more of a research guide or learning facilitator rather than a lecturer. I think that rethinking the entire structure of curricula, pedagogy of teaching and structure of classroom would probably improve the ability to use projects like this.

Beall also suggests that the curriculum should be project centered and that students should have an opportunity to present their work at the end of the term. "I think the one thing that I’m convinced is that students need a week at the end to present there own projects, ... and that students work be in the forefront of demonstrating their learning."

Involving scholars from the Italian Department, and providing resources from institutions of higher education, offer much to the K12 environment. First, resources developed by higher education have an increased opportunity to reach students who might not otherwise have access
to them. The deployment of these advanced resources in the K12 schools improves the quality of materials available to students overall. Finally, students who have access to scholars and their work have an opportunity to engage a community that is normally closed to them. Beall shares the students' enthusiasm for this access when he notes, "Access to individuals at Columbia was the most exciting aspect of the project." And Beall elaborates, say:

I think that secondary school students are capable of posing very sophisticated questions. That can bridge the university and the schools into a learning community together in a way that I think that would be very excited for both communities. My students in eighth grade, I asked them to grade books they had read, and the book that by far got the highest grade was Dante's inferno. Students can respond to a great classic on a variety of levels.

Involvement in this community at early ages is likely to improve student contributions to the community over time because of a student's sustained exposure, thereby benefiting both the student and the academic community.
V. Conclusion

The Collegiate project provided much valuable information about the effectiveness of Digital Dante as an educational resource for high schools. Developers were able to identify the most popular features of the site as well as areas for further development. Email and the search engine proved most popular; students desired greater opportunity to interact with peers, and the teacher sought expansion of the multimedia resources. The results of this project, although preliminary, are encouraging. Students gained technical skills that they are not likely to have gained at school otherwise. And even with limited exposure to networked resources, several students reported feeling a sense of autonomy and empowerment. These students explored content they said they would not have investigated otherwise. While some students clearly found benefit in their use of the advanced technologies for the purposes of their class research requirements, by the end of this project it became apparent to observers and participants that the use of the Internet could offer even greater advantage in "adjusted" school environments.

Collaboration between scholars and teachers is critical to the successful continuation of efforts like Digital Dante. The Collegiate teacher encouraged academics to get involved:

Great teachers love important questions by students even if they've been posed 100 times before, they can be posed in a fresh way, and sometimes they haven't been posed before. Any scholar who is interested in his or her scholarship resulting in generating excitement and provocative thinking in younger students of that great literature would respond with support for this kind of project.

Scholars can support projects like Digital Dante in numerous ways. Of course they can appear in school classrooms themselves, either in person or by videoconference. But they can also support the project by waiving copyrights so that scholarly material can be added to the site and by involving their graduate students, providing valuable teaching experiences for doctoral students and valuable expertise for the classrooms. In addition to its obvious benefits, demonstrating impact of advanced scholarly work at the K-12 level can help academics secure research support from granting agencies. Universities, professors, schools, teachers and students all stand to benefit from increased collaboration.
APPENDIX a:

Evaluation Design

Evaluators employed several methods of data collection, including survey, interview, and observation. A pre- and post- survey was distributed to all students. Survey questions were designed to assess students' attitudes about classical studies in general, about their technical experience, and about their perceptions of the effectiveness of Digital Dante. Several questions from the pre-survey were repeated on the post-survey in order to gauge change in attitude on a range of topics. Questionnaires and interviews were constructed to reflect the course objectives, which were to:

- introduce students to networked, digital resources
- expand student access to academic resources
- incorporate multimedia resources
- identify features of a networked digital curriculum most appropriate to environments with standard computer technologies.

At the end of the course, three students and the teacher were interviewed to gain richer understanding of their experiences with Digital Dante. Site visits and participant observation were used in gathering data about the process of implementation during the time Digital Dante was used as a class resource.