



technology, children, schools and families

The schooled society and beyond: the modernizing role of formal education as an institution

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Abstract

Formal education - schooling from kindergarten well into adulthood at colleges and universities and other higher education institutions - transforms modern society in ways that were unimaginable at the beginning of the 20th century. This educational revolution has generated a new type of society: *the schooled society, wherein not only all children and youth attend long periods of formal schooling and adult status is mostly determined by academic outcomes, but also a society where all institutions are increasingly influenced by the ideas, values, and norms originating out of education as a social institution.* Seen this way, formal education is a dominating social institution that, with increasing dynamic legitimacy, has expanded and intensified over the past 150 years to the point where along with effects on individuals, formal education generates new ideas about people, new privileged human capacities, new ideas about knowledge and its generation, new expanded social and occupational positions. The educational revolution produces what might be called a "*schooled consciousness*" promoting a culture of universalistic values, human empowerment, scientific knowledge, and rationality, not only at the individual level, or even at the level of aggregated individuals, but at an institutional level. Described here are two major consequences of the schooled society on knowledge and its acquisition: 1) the unprecedented growth of a knowledge conglomerate in universities, and 2) the change towards ever-greater value placed on academic intelligence in human society. Two future scenarios are projected from research on the expansion of education, and policy implications from the more likely scenario are described.

Keywords: school, society, knowledge, education

Initially described is the overarching trend of the rise of a schooled society that will determine much of the future of education for some time to come. Following this, two major consequences of the schooled society on knowledge and its acquisition are discussed. The first consequence is the unprecedented growth of a knowledge conglomerate in universities, and the second consequence is the change towards ever-greater value being placed on academic intelligence in human society. The final section

provides some thoughts on the BCH questions vis-à-vis the two consequences of a schooled society described here.¹

I. The Rise of the Schooled Society

A quiet revolution has been afoot over the past 150 years that is under-appreciated and often completely overlooked, yet it profoundly influences our lives, shapes who we are, how we think and work, and what we value most. Formal education - schooling from kindergarten well into adulthood at colleges and universities and other higher education institutions - transforms modern society in ways that were unimaginable at the beginning of the 20th century. The idea of a *schooled society* is precisely this: *a society in which not only all children and youth attend long periods of formal schooling and adult status is mostly determined by academic outcomes, but also one where all institutions are increasingly influenced by the ideas, values, and norms originating out of education as a social institution.*

In a very short time, human society all over the world went from providing only limited schooling for the masses while saving advanced education opportunities for small numbers of elite students, to schooling all children and youth. The standard of how much schooling it takes for one to be considered an educated person has steadily risen with every new generation. This is obvious from our own families' educational history where completing secondary education for our grandparents was a major personal accomplishment, while most of our generation assumed that college was a very desirable, if not totally necessary, goal, much like many of our children see post-graduate training as a normal and not a particularly unique education aspiration.

At the most basic level it is very apparent that schooling has steadily pushed its way into lives all over the globe. Just fifty years ago one half of all Americans either had no schooling or had attended only primary school, while in just three short generations we have progressed to the point where almost every American adult has at least graduated from high school and over one half of American adults have gone on to colleges and universities. During the same period whole populations in poorer nations went from having no access to any schooling to widespread primary and secondary education. Currently 80% of all humans aged 15 or over are able to both read and write a short statement about their life (UNESCO, 2003).² This fact would have been hard to imagine just fifty years ago, and most likely it would have been plainly unthinkable one hundred years ago.

The triumph of the ideas behind the educational revolution transformed the world in just 100 years from a place where the vast majority of humans received little or no formal education, to one where it is deemed a worldwide crisis if full education for all is not achieved soon (UNESCO, 2003). And in just the last 20 years the public rhetoric shifted from one of *education for all* as a positive, if distant, potential to one of *education for all* as an absolutely essential world goal.

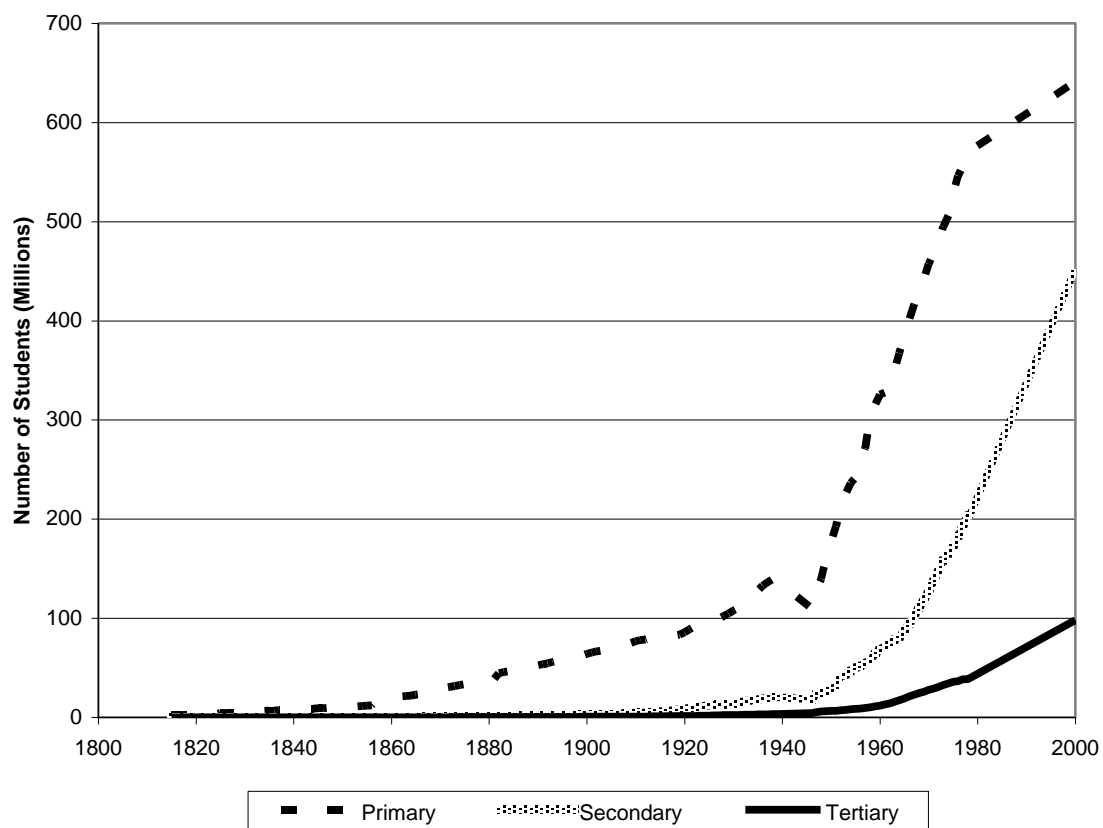
Yet, the education revolution is not only about bringing just basic education to all; many nations, wealthy and less so, are in the midst of an unparalleled growth of higher education for all. Following these trends out over the next fifty years, one can easily imagine a world where most people live and work in what can truly be called a *schooled society*.

¹ Parts of this essay are to be published in Baker, D. (2009). "Privatization, Mass Higher Education, and the Super Research University: Symbiotic or Zero-sum Trends?" *Die Hochschule* (German Journal on Higher Education).

² Most people who are still illiterate are living in very poor nations and seven out of ten are women (UNESCO, 2003).

The demographical dimensions of the schooled society are well known and have been documented in great detail. In most high-income nations, such as the UK, US, Japan, France, Germany and so forth, mass education has steadily expanded up the life course over the past 100 years. By the turn of the 21st century the dimensions of education in the world are immense in terms of its recent growth, its claim to people’s time and effort, and its impact on their lives. What is most salient about the education revolution is both its relative newness to the human society and the speed by which it grown. As shown in Figure 1, which plots the total worldwide number of students enrolled in primary, secondary, and tertiary (ie higher education) schooling over the past 200 years worldwide, a short time anthropologically-speaking. And, once started the rate of growth for each level of schooling rapidly becomes significant and sustained. Note also that over the first few decades of the 20th century growth in primary enrollment takes off and by 1940 bursts into a logarithmic climb, and as primary schooling reaches large numbers of children 20 years later, enrollment in secondary schooling turns sharply up in the 1960s. New advanced sectors of education are spurred on by the growth of the subsequent sector. Demographically, going to school and attending for a considerable number of years is a new and massive change in behavior of children and youth, and supporting this endeavour is a new role for their families and communities.

Figure 1: Number of Students in Elementary, Secondary, and Higher Education Worldwide (Source: Schofer and Meyer 2005)



Since the early 1970s the third wave of the education revolution has unfolded as enrollment in higher education has grown substantially. For example, only about 500,000 students were enrolled in higher education institutions worldwide at the beginning of the 20th century, representing a tiny fraction of 1% of college-age people, but by 2000, the number of tertiary students had grown to approximately one hundred million people, a number that represents about 20% of the relevant age cohort worldwide, and most of this growth occurred after 1960 (UNESCO 2004). In higher-

income nations, it is now common for more than half of all youth to receive some post-secondary schooling, with numbers surpassing 80% in a few countries (UNESCO, 2004). But, the expansion is not limited to the wealthy, industrialized societies; countries like Algeria, Kazakhstan, and Myanmar each now possess about as many post-secondary students as could be found *in the entire world* at the start of the century (Schofer and Meyer, 2005).

Providing widespread educational opportunity for nations' populations is not only widely thought to be desirable, it is now approaching the status of a basic human right like nutrition, health care, and civil rights. Following the post-WWII trend of greater involvement of multilateral agency involvement in assisting nations' economic development, representatives from major agencies such as the United Nations, UNICEF, the World Bank, UNESCO in alliance with governments of most nations, and international non-governmental organizations (INGOs) such as Oxfam and Action Aid gathered together at an international conference in Jomtien Thailand in 1990. Not only did they once again declare that education is a basic human right, but they set forth a plan of action to make education universal worldwide - the Jomtien Declaration. This process was updated and intensified in 2000 at a similar international conference on *Education for All* in Dakar, Senegal. In each case the attendees of the conferences affirmed the need to have all children have access to quality education within a relatively short time frame for not only the good of nations, but also for the good of the worldwide society. And ambitious and clear steps to meet these goals are widely dispersed throughout the developing world. But the schooled society is far more than just the mechanical expansion of formal education up the life course for ever greater proportions of humans. As an institution, formal education has come to be one of only a few dominating modern society, and this social development in the course of human society worldwide holds a number of central implications for the future.

How to Think about the Education Revolution?

In light of this sweeping educational revolution, there is an interesting paradox about schooling in modern society. On the one hand, we attribute many powers to schools: teaching children to read, to understand mathematics and science, to practice and enjoying the arts, to memorize the historical development of a nation, and now even to know about the development of human society across time and place: these are all routinely thought of as what schools do to transform children into functioning adults. But on the other hand, schooling is frequently portrayed as failing modern society in fundamental ways, leaving the educational revolution under-appreciated, and the wide dimensions of the schooled society have gone mostly unnoticed. There is much discussion and hand-wringing over the problems with schools; great things are expected from them, but they seem never fully to deliver. Here is one example of the dire concerns many have about the quality of modern schools; this one was made by the founder of Microsoft, Bill Gates, at the National Education Summit on American Secondary Schools held on February 26, 2005:

America's high schools are obsolete. By obsolete, I don't just mean that our high schools are broken, flawed, and under-funded – though a case could be made for every one of those points. By obsolete, I mean that our high schools – even when they're working exactly as designed – cannot teach our kids what they need to know today. Training the workforce of tomorrow with the high schools of today is like trying to teach kids about today's computers on a 50-year-old mainframe. It's the wrong tool for the times. Until we design them to meet the needs of the 21st century, we will keep limiting – even ruining – the lives of millions of Americans every year.

Why this paradox of such high expectations for schooling yet such concerns about its supposed perpetual failure? First, most people do not recognize the power by which

mass schooling transforms society. Second, many people, even professional educators and scholars of education, become overly fixated on specific parts of what schooling is supposed to do for society at the exclusion of perceiving its formable total impact. Third, formal education is so ubiquitous in modern life that people rarely appreciate the dynamic way schooling has intensified over recent history and in so doing incorporated itself even deeper into our lives. Fourth, most people limit their view of schools, colleges, and universities as “helping” institutions that only socialize (some say even oppress) and train our children to join society.

But contrary to these perceptions, in point of fact, schooling from kindergarten through higher education continues to be one of the major success stories of our times; far from a failure, it has transformed who we are, how we think about ourselves, and what we can do. Interestingly, this fact often goes unappreciated by most in modern society, including professional educators and many social scientists.

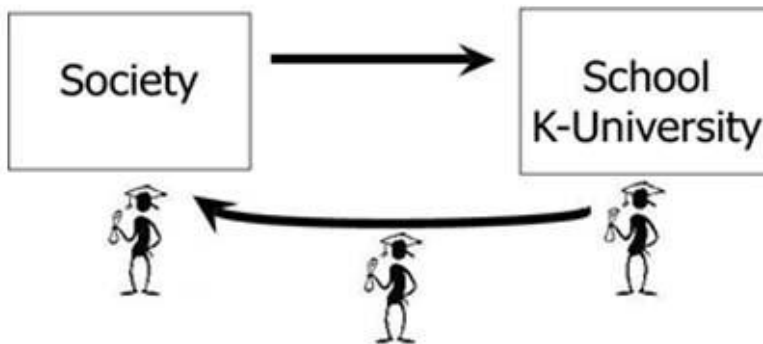
But over the past few decades, a group of social scientists—mostly sociologists—have developed a new way to think about the effects of education on modern society that opens up a much wider appreciation of how education transforms everyday lives. Armed with a new perspective known as *neo-institutionalism*, these researchers are undertaking exciting new studies outlining the contours of the transforming activity of sending all children to increasingly longer periods of schooling (eg Baker and LeTendra, 2005; Meyer, 1977) The overarching conclusion from these studies presents a vivid picture of how profound the effects of educating all people has been on modern society, and points to the path that the schooled society will likely take in the future.

To appreciate this new perspective, first consider the traditional notion of formal education’s role in society. On an institutional level formal education is considered to be only a supportive and secondary institution that follows in form and content wherever society takes it. Probably the most popular image is that of education following (too slowly as Mr. Gates and others would have it) the changing demands of work in particular, and changing societal complexity in general. Seen this way, schooling is an institution primarily limited to the training of individuals for jobs and the socializing of individuals for a particular society. The traditional notion is that formal education reproduces society, changing only as society changes at the hands of various external forces. This image is depicted in the top panel of Figure 2, where schooling only socializes students through teaching curricula and credentials them for adult positions, while the institutional unidirectional influence flows from society to schooling.

Figure 2: Two Models of Education's Relationship with Society

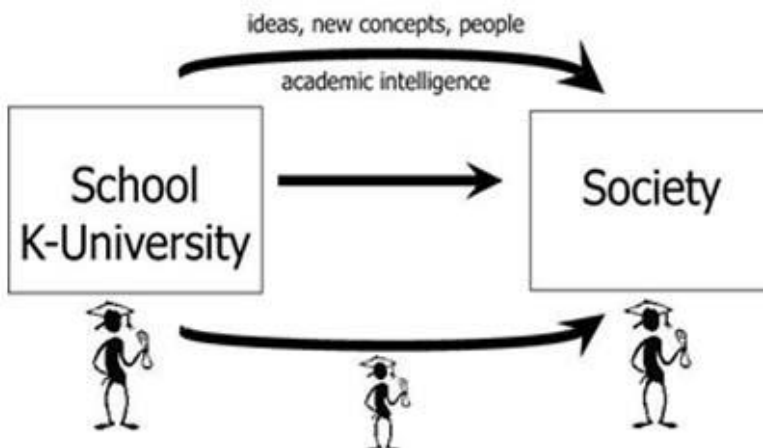
Panel A.

Traditional Perspective



Panel B.

Constructionist-Institutional Perspective



A neo-institutional analysis turns this traditional notion on its head by arguing that an accounting of the full impact of the education revolution finds that there is much evidence to show that society has come to be more of a reflection of the institution of education rather the other way around. This new image of education and society is one in which formal education is a successful primary institution, so successful in fact, that over the past 50 years it has come to dominate many other institutions such as the family and child rearing, the workplace and ideas of human capabilities, politics and citizenry, and even highly personalized domains like the definitions of success and failure in life (Baker, forthcoming, a).

The lower panel in Figure 2 depicts this perspective with education as a primary institution in the construction of society. While education continues to educate and credential individuals for roles in society, the institutional influence flows from schooling to society. Over the course of Western society, in large part because of the rise of the Western university, as education came to play a larger role in creating central ideas and

beliefs of modern society, it won significant legitimacy to educate individuals. In turn, educational achievement became central to individuals' social status. This dynamic legitimacy has expanded and intensified over the course of the education revolution to the point where, along with effects on individuals, formal education generates new ideas about people, new privileged human capacities, new ideologies about knowledge and its generation, new social, including occupational, positions, and so forth (Meyer, 1977; Young, 2008). The educational revolution produces what might be called a "*schooled consciousness*" promoting a culture of universalistic values, human empowerment, scientific knowledge, and rationality, not only at the individual level, or even at the level of aggregated individuals, but at an institutional level.

This perspective makes the strong case that schooling, as it has been practiced over the past 150 years, is far more than a preparatory exercise for youth, merely following where the technological and social demands of society take it. Rather, the educational revolution has constructed, for better or worse, most of the dominant ideas, beliefs, and human capabilities that underpin human society as we know it at the beginning of the 21st century. This is how best to think about formal education and its possible future impact on society.

It should be cautioned however, that because of the widely Pollyannaish expectations about schooling noted above, discussion about a schooled society is frequently misinterpreted to mean that all things good result from more schooling and its greater role in the definitions of contemporary culture. On the contrary, there are a number of arguments that start with the assumption that schooling is mostly oppressive (see Young, 2008) for a review and important critique of this line of thinking about schooling). And of course, from schooling used in fascist to apartheid societies over the 20th century, there are a number of well-known extreme examples of educational oppression.

Interestingly though, most schooling-as-oppressive-always arguments presume a traditional perspective of schooling as described above: to the degree that a society is oppressive so is its schooling as it "prepares" people for the oppressive social order. In other words, schooling reproduces and even validates existing social inequalities. But the social reproduction argument misses the point that schooling as a social institution constructs society. Seen this way, schooling, if it were truly as oppressive as some argue, would have to be the root of oppression. Some have tried to make this case of course (see Bowles and Gintis, 1976, for the US and Willis, 1981 for the UK), but by in large these have failed to account for the actual historical record of schooling and social class in most industrial nations (Baker, 1999). And as many studies of worldwide, mass schooling and the western style university show, formal education curricula, even in oppressive societies, constructs and spreads an explicit version of human social justice, democratic values, and human universalism that runs counter to most of the extreme forms of social oppression (eg Fiala, 2006). Hence there are many well-known incidents of suppression of intellectuals and draconian control over schooling to limit its liberating influence in many politically oppressive nations (see for one example from Germany Baker, Kolher and Stock, 2007).

Nevertheless, it should be pointed out that the schooled society powerfully creates social pressure to conform to its logic and punishments for those who do not or cannot conform. Like all social orders that increasingly come to be dominated by a few key institutions, the schooled society shapes normative restrictions. Anyone who is close to an educationally failed child, or was one himself, knows the pain and frustration of not doing well in school. In the schooled society, a youth's image of their future becomes dim when performance in school, for whatever reason, is not successful. And this is far more than just in the technical issue of grades and test-scores: failure in school reflects upon the whole of the individual and remarkably even spills over negatively onto his or

her supporting family. So too as the schooled society intensifies, non-academic types of skills and ideas about human capacities become less privileged and less developed.

The Future of the Schooled Society

There are two scenarios about how the schooled society will proceed that predict diametrically opposed futures. Mostly along the lines of the traditional image of education and society, the first scenario is by far the most popular one among pundits, casual observers, and often educators alike, but it is far less likely to occur than the second scenario. Therefore, after a brief description of each, the educational implications of only the more likely second scenario are discussed.

Scenario 1 The Over-education Scenario:

This future scenario predicts that:

The education revolution has now reached its highest point and will wind down over the next three decades into a stasis of relatively little upward expansion of education and a reduction of education's supremacy over social positioning. Spending upwards of 12-16 plus years in school reaches natural limits of the life course and foregone wages. Most of the educational expansion of the last forty years is a process of educational inflation, where new degrees are required for the same jobs. This has resulted in over-educated populations that are economically and socially inefficient and perhaps even dangerous to social cohesion, as individuals who are over-educated will develop unrealistic expectations for jobs and status in adult life that will not materialize.

Also, inflated schooling "dumbs-down" education in order to accommodate the influx of large segments of the population flooding into higher reaches of formal education that are not qualified, not motivated, nor very academically talented. Other than relatively basic skills of numeracy and literacy, schooling does not add much that is usable, or not otherwise trainable on the job. Runaway credentialism emerges when an educationally hollow status competition takes over the expansion of formal education.

With just subtle variations, the over-education scenario has been predicted as our imminent educational future virtually ever since the schooled society took off in the 1960s. Under book titles such as *The Diploma Disease*, *The Great Training Robbery* and *The Credential Society* many predicted that over-education would be a major social problem and educational expansion would evidentially grind to a halt (Dore, 1976, Berg, 1971, 2003; Collins, 1976; also see Bowles and Ginitis, 1976. This was a particularly common forecast in the UK and in nations where a colonial past left a British type of education system (Dore was an influential British observer of education and national development) and in the more aggressively expanding American system (Bowles, Ginitis, Berg, and Collins are American scholars) as higher education enrollment rates started to climb - surely the education revolution was going to die at the university's gate.

The usual policy implications of the over-education scenario is to somehow save education from itself by imposing tighter linkages between formal schooling and jobs, revive vocational education, maintain greater control over testing and admission standards to university, and belief in what was once called "manpower planning" of a centrally guided education and jobs system.

Scenario 2 Continued Educational Expansion and Intensification of the Schooled Society:

This future scenario predicts that:

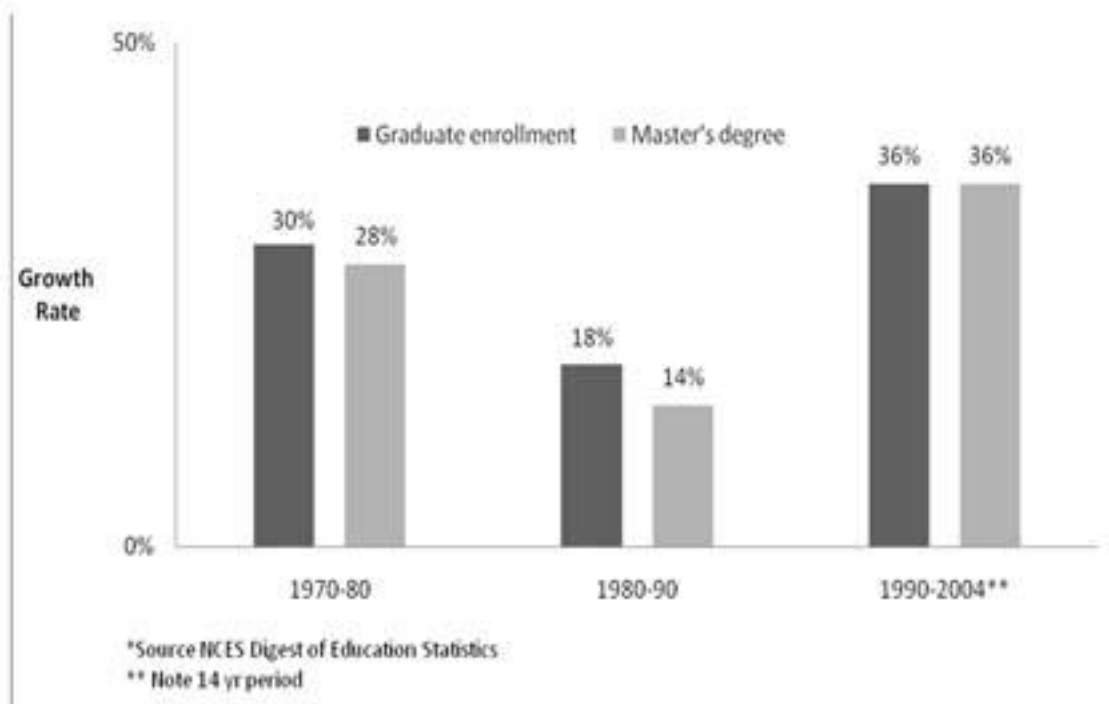
Early, and persistent, predictions of an approaching over-education future were wrong - in fact, they were spectacularly wrong. So much so, that growth of the schooled society into the future and its continued construction of much of our culture is very likely.

The evidence that Scenario 2 is more likely to occur in the future than Scenario 1, in that for each predicted part of the over-education scenario much the opposite has occurred. Briefly, there are five sub-predictions that never materialized, and what did happen in each case is more in line with an expanded and intensified schooled society. The evidence below is mostly from the US, but it should be noted too that for a number of historical reasons, the political economy of American schooling has tended to herald each new wave of the education revolution and its ensuing spread worldwide, often even changing long standing educational traditions in the UK and other nations of Western Europe (Baker and LeTendre, 2005).

Failed Prediction 1: Natural limitations on the amount of the life course people will spend in formal education will eventually retard educational expansion as the main engine of the schooled society.

People continue to seem quite willing to gain ever-greater amounts of education, even foregoing wages. Life course limits are pushed aside by the spread of the logic of "life-long education." What were once advanced degrees for a very small population are increasingly expanding to meet demand by larger segments of populations propelled by mass education at lower levels. For example, as shown in Figure 3, both enrollment in all graduate programmes and completion of master degrees (ie post the usual 4-year baccalaureate) have increased by substantial amounts since the 1970 in the US. Furthermore, from just 1970 to 2004 the growth rates among Americans completing a masters and Ph.D. degree is 140% and 50% respectively. And similarly, professional degrees, such as law, medicine, dentistry, have increased by over 100% over the same period. And while this trend is occurring in the U.S., it will most likely rapidly spread through many national systems of higher education.

Figure 3. Growth Trends in University-Graduate Study in the U.S. 1970-2004



Failed Prediction 2: Educational expansion will have to be limited in the future as more people reach advanced degrees and the end of the structure of formal schooling as we know it.

There are recent new patterns of educational expansion occurring in the US as more people seek multiple university degrees. For example, the US Department of Education followed a nationally representative sample of 1992-93 B.A. completers over the following ten years. Four out of ten enrolled in some graduate study during the decade, and one fourth of those enrolled in multiple graduate degrees of which half were for two or more masters in different disciplines (US Department of Education, 2005). Among B.A. degree-holders from private research universities, where most of the spectacular success of American research universities has been (see below), over one half of B.A. completers enrolled in graduate programmes and over a fourth of these enrolled in more than one degree programme at some time during the ten year span. Similarly, large numbers of B.A. holders envision themselves as completing a graduate degree or even two sometime in their future; and, the US study reports that at the time of the B.A. completion a full 85% expected to undertake graduate training over the ensuing decade. Of course this did not happen (yet) for about one-half of these individuals, but the implications are clear—graduate training at university is becoming more normative with each decade, and the growth of graduate degrees and multiple graduate degrees is an outgrowth of this. And of course there has been a worldwide expansion of adult access to additional formal education and this will likely continue into the future.

Failed Prediction 3: There will not be much job up-grading as more of the labor force enters with more education, thus leading to an educationally hollow and unsustainable credentialism.

There is an emerging research literature indicating that the schooled society has had a profound impact on many dimensions of the workplace and job content technology, including how it is incorporated into work. Largely on the pages of the *Quarterly Journal of Economics* over the past decade and one half, economists of labor and national

development have developed an insightful set of empirical findings about the relationship among education of workers, technology, and the organization of the work inside firms. Over and over these studies report that education influences the world of work more than the other way around. What once was the standard assumption that as each generation attains more formal education there is little true job upgrading has been buried by these recent studies.

Failed Prediction 4: *Over-education leads to future social unrest and great dissatisfaction with schooling in general.*

There is no evidence that this most dramatic of predictions of the over-education scenario ever happened in any part of the world as mass schooling and higher education rolls on. And there is some systematic analysis that verifies this. A representative example is the comprehensive study by Val Burris who finds in a 1983 analysis of a large nationally-representative sample of working Americans no substantial differences between people who are over-educated for their jobs and those who are not across their stated job satisfaction, political radicalism, political alienation, unionism, and allegiance to an achievement ideology.

Failed Prediction 5: *Educational Expansion "dumbs-down" education, making it less relevant to changing human capacities in the future.*

This is a common prediction that is hard to test, but there is emerging evidence to suggest if anything, mass education has made schooling far more demanding on a cognitive level than was the case at the beginning of the last century. For details see Consequence II below.

II. Two Consequences of the Schooled Society for the Future of Knowledge, Creativity and Communication

If scenario 2 is the more likely to occur in the future, what are some of the main educational consequences and policy implications? Two are described here, one for higher education, and the other for all levels of education starting from the very beginning of schooling.

A. The Future of Knowledge Production: The Super Research University's Knowledge Conglomerate

The advent of the *super research university* (hereafter, super RU) and its *knowledge production conglomerate*, primarily in the US, over the past several decades is a stunning development of the schooled society with major implication for the future of society (Mohrman, Ma and Baker, 2007). An intensification of a number of unique qualities of the Western university has resulted in a small, but growing, number of institutions with the capacity to produce unprecedented levels of science, technology, and knowledge about human society. Sometimes identified as "world-class research universities," these institutions are, for better or worse, leading the establishment of an emerging model of the university that is rapidly becoming the accepted standard by which institutions will undertake graduate training and research. For better or worse, the ideas driving the super RU are rapidly forming into a pervasive normative model for the university throughout higher education worldwide with major implications for knowledge, science and technology production into the future.

So too, the rising super RU model, emulated by so many universities supported by the schooled society, has set the foundation for the much discussed knowledge society, and its variations such as Richard Florida's creative class and Robert Reich's symbolic analysts. In a dynamic interplay between knowledge production and the expansion of

knowledge domains, the university has played a key role. It is the main arbitrator of knowledge, not just in the form of science and technology, but also in terms of business, social science, and traditional humanities (Frank and Gabler, 2006). The knowledge conglomerate has also worked to expand the range of occupations assumed to require a university degree. This is counter to the much touted claim in the early 1990s that universities' knowledge production system, Mode 1 science as it was known (eg Gibbons et al, 1994), would become outdated and give way to a mostly a non-university based new system, called Mode 2 knowledge production. But the original prediction about the decline of knowledge production at universities did not happen; while non-universities organizations got into the knowledge production process, the super RU has actually increased the university's share of an expanding knowledge production conglomerate (Geiger, 2004).

For example, here is how some leading neo-institutional analysts of the university and its role in the schooled society describe this institution power of the university:

The university - while inefficient at preparing people for specialized roles, in comparison to direct role-training arrangements - is extremely well positioned to support precisely such generalized notions. Students learn - and society itself learns - that all the specialized and professionalized roles of contemporary society are fundamentally based on universal scientific knowledge and rationality, and that with schooling, ordinary persons can be transformed to possess the relevant competencies (Meyer et al, 2007, p203)

Briefly listed, the growing literature on these super RUs identifies a set of defining characteristics that most observers agree upon (eg Geiger, 1993; Mohrman, Ma and Baker, 2007; Baker, forthcoming, b) including: *Research Intensive; Transcending global mission; New Knowledge for the Good Society; Decline of the Traditional and the Rise of the new Professoriate; Recruitment of Academic Core in National and International Markets; Greater Internal Complexity; Denser Networks of Universities and Steeper Competition Worldwide; Extreme Costs and Mixture of Funding.*

By and large, the rise of the super RU stems from the American higher education experience with mass education and a norm of universal access. The muscular approach to knowledge generation stems from a broad consensus in the US (and everywhere else too) around the idea that university research is crucial to economic global competitiveness (Geiger and Sa, 2008). Over the past several decades, three major transforming trends in higher education are unfolding that are widely discussed, yet only rarely in relationship to one another. In fact, for many higher education observers, these three trends represent opposites within formal education, that on the surface seem to create more conflict than harmony within the university. One trend, often divisively debated, is the rapid growth of the private sector of higher education across most nations. The second trend, often considered pedestrian, is the unprecedented expansion and massification of higher education in not only wealthy nations such as the United States and those in Western Europe, but in almost all nations as well. The final trend, often celebrated, is the rise and flourishing of super RUs; mostly in the US, but increasingly now as a model aspired to by many research universities throughout the world. What is not often appreciated about these three trends is that at their root they are related, even symbiotic, to the point that each likely would not be happening if it were not for the other.

An appreciation of the underlying relationship among these three seemingly separate major transforming forces in higher education develops a fuller picture of the institutional dynamism behind the growing legitimation of the university and its role in shaping the schooled society now and into the future. Frequently these three trends are assumed to be in some kind of zero-sum competition with each other, but this

underestimates the institutional power of the educational revolution and the role of the university in its development. Also such an underestimate can lead to a policy environment in which universities and ministries of education around the world actually inhibit the development of mass higher education, private institutions, and efforts to reach for the full capacity of research universities to generate new knowledge and train the next generation of scientists and scholars.

These three trends are bound together in the case of American experience with higher education. This has always been so, but recently the dynamism among these trends has intensified to an unprecedented level with clear implications for the future. Often this intensification of private funds within American RUs is seen as a decline in the strength of universities as an institution, but in fact the very opposite case - that private funds reflect the growing overall strength of the university - can be made.

Focusing on the American case to predict the future of knowledge production in universities worldwide is not meant to imply that all nations must follow this pattern, nor is it intended to be a statement about political or cultural hegemony. Rather, it is justified by the fact that, for better or worse, the US has been the world leader in the institutional changes represented by mass education and the coming of the schooled society. This is also not to say that how the American school system is operationalized in practice is necessarily the world leader (on a number of criteria, it is not), rather what comparative research on education change clearly shows is that over the past few decades there is increasing worldwide isomorphism among national school and higher education systems, and many of the ideas, goals, values and beliefs behind this process originally stem from the American experience with formal education, particularly since the 1960s (eg Baker and LeTendre, 2005).

How then to think about these three phenomena together?

Geiger traces the dimensions of science and technology development in US universities over the past half century and his cogent analysis of basic research production shows precisely the enhancing of the societal mission of the university (Geiger, 1993, 2004). Historically the rise of the "knowledge production conglomerate" in American research universities consists of a robust funding situation plus existing trends in the organization of university research and scholarship aimed at interdisciplinarity, the proliferation of research institutes, and 'raising the bar' in faculty hiring that are at the heart of the super RU model. This aggressive approach to knowledge generation that ensues from this feeds into the idea that university-based, or university-influenced, research is crucial to economic global competitiveness. It is a short jump from this image of the role of the university to society-wide consensus that the university is a leading institution for the good of society. This very image of the American university, as it transforms itself into a super RU, is widely evident in the American culture.

This is often missed as many observers of RUs assume that privatization and public funds are in a zero-sum relationship. And indeed a superficial reading of trends can lead one to this conclusion. It is true that the American federal government's share in funding research (once the source of most university-based research) declined dramatically over the last twenty years from almost one half to just over a fourth of the nation's total expenditures on R&D. And what gained proportionally during the same time were privatized sources, which now fund 70% of all American R&D. Furthermore, the funding for basic research, which is predominately carried out in universities, grew only from about 14 to 18%.

What goes unappreciated though is that both public *and* private funds have flowed into American universities as a consequence of this broad societal consensus around mass higher education, and therefore university-based research has increased proportionally (Geiger, 2004). Overall growth of all American R&D from 1980 to 2000 kept pace with

the rapid growth of science and technology that the world has seen since the 17th century. Combined university-based and non-university-based R&D (basic research and expensive technology development) spending from 1980 to 2000 more than doubled in constant dollars from about \$115 to \$248 billion. And importantly, within this rapidly expanding R&D climate, the university has held its share at about one-half of all basic research. While federal (ie public) support to American universities has declined, it has been replaced from *private economic sources*, so that overall academic funding as a share of GDP grew by 50% in just twenty years, to an amazing \$28.2 billion in 2000.

Also, the rise of the model of the super RU (private and public) and expanding access to higher education are both large-scale trends that reflect underlying models of education and its role in society that in turn are transforming higher education. To see this argument, it is useful to consider the context from which the super RU model originated. As pointed out, the US has the highest number of universities with the characteristics described above. These are universities that produce considerable amounts of new knowledge across many fields (eg out of the top 10 universities worldwide with the highest citation rates per faculty size rates, 8 are US institutions, and of those 5 are private). And many other American universities are above the world average in citations. Similarly, out of those universities worldwide that can generate the enormous level of research funding, by far most are American, as shown in Table 1.

Table 1: Top Ten Universities in Citations/Faculty Size

Rank	World Total	Rank	Citations Score
1	7	California Institute of Technology	100
2	1	Harvard University	55
3	6	Stanford University	55
4	4	Massachusetts Institute of Technology	54
5	32	University of Texas at Austin	53
6	44	University of California, San Diego	42
7	8	University of California, Berkeley	39
8	92	Erasmus University Rotterdam Netherlands	38
9	18	Ecole Normale Supérieure, France	37
10	10	Princeton University	34

Source: The Times Higher Education Supplement, October 6, 2006

But the usual take on the American case - private money, low central control, and high tolerance for between-institution inequality (in part a function of inequalities produced by mixing private and public funding sources) - *is not* the root cause of why so much of the super RU model stems from the American experience. In other words, the super RU is not just the product of the historically unique private section of American higher education. It is not just that the super RU model is an expensive one to pursue, requiring a wealthy society. Nor that private money is now a substantial source of funding in the U.S. Nor even that many super RUs are privately controlled. While these factors certainly have enhanced the development of the super RU model, they are not at its root cause. *Instead, the cause is found in the way in which American society has generated widespread societal support for higher education, institutionally led by the research university, which includes private universities and private support for significant parts of public universities.* In other words, formal education in the US has been an early leader in the movement towards universal access to higher education and all that such an idea includes (Trow, 2005). Instead of assuming that mass access to higher education, the super RU model, and the role of private funds are mutually exclusive, zero-sum forces, what the American case illustrates is that in reality these three trends

have significantly supported one another in the past and will continue to do so into the foreseeable future.

It is true that this fundamental symbiotic relationship is not the product of some central plan, instead it grew out of a unique set of historical conditions. The effects of which have become more obvious as the model for the American super RU becomes attractive to many other nations leading higher education there to mimic certain aspects - including faculty working conditions, competitive-based governmental support for research, a large private sector basis - as well as the idea of substantial private funds within the system. But what is frequently overlooked in these efforts is the exceptional societal support the US has been able to generate for education in general and higher education in specific—both public and private.

American society has achieved this for essentially two reasons: first, through a widely comprehensive system of public (and to a lesser degree private) secondary education graduating youth with the aspirations and expectations for more education, and second through a relatively open and comprehensive higher education system made up of both public and private universities and many small private colleges. This has led to the belief in American society that the university, and particularly the super research university, is not an elitist or esoteric enterprise; instead, it is perceived to a remarkable degree as a democratic and useful institution. The fact that so many Americans attend some institution of higher education and have deep connections to these institutions in all of their many types, translates into wide societal support (ie public *and* private monies) for the costs of super research universities, even if only a small proportion of Americans will attend, or has attended, one of these highly selective institutions. As with the expansion of mass and comprehensive (ie non-stratified) elementary and secondary education, the US has over the last century led the way in mass higher education with the idea that more and more types of people can develop as individuals (and not just as workers) through extended formal education (about 60 to 70% of American youth with a secondary school degree enroll in some type of higher education). At the same time, what the research university is thought to do for American society further legitimates the expansion of education for all. Also, private universities and private aspects of public universities have played a direct role in mass education.

The tremendous level of private support for higher education in the US is not only a reflection of rising tuition, it is also a reflection of the way that higher education in general, and universities in particular, are thought about in the US. The lack of a state controlled exclusive set of universities and other institutions of higher education in the US has led to robust and broad private support of individual institutions, and also of the entire sector to a degree. Certainly rising tuitions and private shares of funding is a trend to be concerned about and in some ways is a product of falling public funds for higher education. But the idea of societal support is broader than just the shifting split between public and private funds. In the US overall, the pie continues to grow for higher education.

The 19th century American land-grant model of the research university laid the groundwork for the future of American higher education, and in many ways perhaps also the future of higher education globally. Here are all of the forerunners to the new ideas that now drive the super research university in terms of the symbiotic relationship between university and society, and joining together several strands of ideas into one institution for the first time. Scientific knowledge, rational social progress, human empowerment, and universalistic values become embedded within the authority of the university, and this authority, based on an intensification of these ideas in the postmodern world, drives the current support of the super RU model in the U.S. (see also Meyer et al, 2007). Also, every land-grant university, even though they are public, incorporates significant private funds, from tuition to research collaborations with private ventures, to huge alumni giving of private gifts (money), to lucrative deals trading

universities' logo for revenue from private sports apparel firms. This is not to pass moral judgment on the American super RU and its privatization; there are clearly positive and negative implications of the model, and thoughtful critics on both sides. Rather, the point of the American case is that one way to think about the growing private higher education sector worldwide is that it is partially driven by the rise of societal support for the super RU from mass education and now mass higher education. And that in turn, once private support for higher education begins to flow and becomes normative, it feeds into the overall growing institutional power of higher education.

The main policy implication for the future of the UK system is not necessarily to copy the details of the American system - in fact, attempts to do so in other nations have not worked very well. Instead the message to take away from here is to focus on factors that increase overall societal support for the knowledge production function of universities. And given the logic of the schooled society, the best way to do so is educationally, not through public relations campaigns and other trivial methods. In other words, opening up access to higher education and lowering early barriers to secondary education leading to higher education generates societal support. If universities remain mostly elitist, this will limit their ability to generate the considerable financial resources needed to compete as super RUs, or world-class knowledge producers in the future. The old model that elite institutions will train the elite knowledge producers and this can be sustained by special public funding is rapidly breaking down.

B. The Future of Knowledge Acquisition: The Rise of Academic Intelligence and the Cognitive Revolution

Formal education is the only institution in modern society that on a consistent basis has the legitimate power to organize all accepted types of knowledge into acceptable format and determine valid truth claims, and specify who and when people have access to learn these new fields (Young 2008). And if this power were not enough, for the first time in human history formal education defines and almost single-handedly focuses society on one particular capability that all normally developing humans must have.

Mass schooling has produced and widely distributed a uniquely new definition of intelligence, and in a relatively short time made it universally accepted as not only useful, but essential to being a fully developed individual ready to participate in modern society. As never before, schooling through its everyday activities has created a new model completely based on cognitive skills about what is important for effective human development and performance. What might be best described as "*academic intelligence*" is perhaps, among all of the significant impact of the schooled society, the cardinal institutional product of mass education. Academic intelligence can be defined as: *those cognitive skills needed to do abstract reasoning, problem-solving, higher order thinking, multiple perspective taking, and effortful thinking.*

All forms of formal education increasingly narrow human capabilities towards cognitive performance. With the development and flourishing of academic intelligence, such skills as mental problem-solving, effortful reasoning, abstraction and higher-order thinking, and the active use of intelligence take center stage while pushing off more traditional academic skills such as recitation, disputation, memorization, formalistic debate, formulae application, accuracy, and authoritative text reading and exegesis. Cognitivism has become the overarching epistemological theme of modern education, and as the schooled society deepens there is evidence that cognitivism continues to intensify in its importance.

Exactly when academic intelligence emerged as the main objective of mass schooling is hard to pinpoint, but there is good evidence that it has intensified over the last half century, and in so doing it pushed aside other older objectives of formal education.

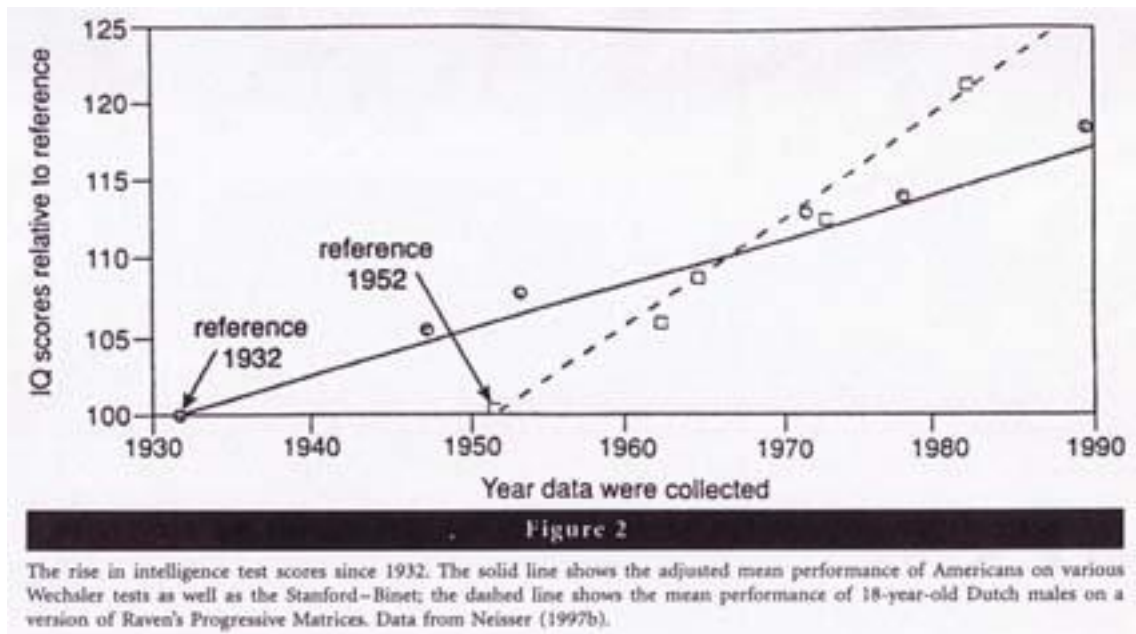
Academic intelligence retains some vestiges of both old classical education and the spirit of vocational training, but it emerges out of a type of dialectic process between these former goals of education, and as such is a synthesis that is quite different from a simple compromise or watering-down of the two. Academic intelligence is what children throughout the world must learn to be a "fully-developed human." Note the change in terminology of the objective of schooling from the older phrase "well-educated" with its implications of mastery of content versus the ontological implications of the contemporary phrase "fully-developed." In so doing on a mass basis, the educational revolution has made much of the traditional epistemological foundation of schooling - classical intellectualism and vocationalism - obsolete.

A good example of the trend towards academic intelligence is not only what is presented in schooling, but also what becomes defined as the way to generate new knowledge in society is the one hundred year evolution of mathematics curricula. A recent study (Baker et al, forthcoming, c), undertook a cognitive assessment of primary school mathematics textbooks (as a proxy of the curricula in the localized US system) over the 20th century. Two of the major trends found illustrate the point here. First, contrary to the notion that mass education "dumbs down" curricula, the mathematics in textbooks has, particularly since the 1960s, included more advanced material at earlier grades. And two, most germane to the argument here, the textbook material from the 1960s onward increased all types of problems that require the kinds of skills that make up academic intelligence. As the cognitive demand of the curricula increases, all students are required to try to think mathematically and reason about the subject in ways that students early in the century were never asked to. The model of young student learning mathematics in the 1940s and 1950s was that of the careful, accurate and tireless calculator, and by the late 1960s on the model was as a "little" mathematician.

A second illustration of the consequence of increased focus on academic intelligence in the schooled society is the case of increasing IQ across generations of adults. Populations of humans living in what are now the wealthier of nations have gotten considerably "smarter" over the course of the 20th century and continue to do so (Flynn, 1987). This once little-known phenomenon, called the *Flynn Effect*, is appreciated by aficionados of the study of intelligence, although pop-sociology has recently spread this fact to a wider audience. When psychometricians compare performance on tests of IQ (intelligence quotient) over the last century they find that the average person in a generation scores higher than the average person in the preceding generation. In fact, the whole distribution of scores has shifted upwards over the past 80 years with each succeeding generation.

As shown on the Figure 4, when raw scores are compared over history a growing average IQ trend is evident to an amazing degree; compared to the average person in 1900, the average person now scores two full standard deviations above this at 130. Successive generations have been gaining about 15 IQ points over the preceding generation; while 15 IQ points may not seem like a lot, it represents going from mere average intelligence to superior intelligence, and of course people with superior intelligence (120 plus) in the preceding generation are matched by people in the succeeding generation with exceptional scores (135 plus).

Figure 4. Rise in IQ, Wechsler Tests and Stanford-Binet, 1932-1992



There are two other qualities of the trend of growing IQ, both of which may be a function of the educational revolution. First, all the evidence uncovered so far indicates that the *Flynn Effect* has occurred only in nations that have been economically developed and had early and sustained mass education for some time, such as Japan, Western European countries, and the US and Canada (Flynn, 1987). And second, the part of IQ that has had the most dramatic historical increases is what is informally called "fluid IQ."

When psychometricians think about intelligence, they often clump IQ abilities into two large sets of capabilities. One set, known as fluid IQ, is made up of our ability to solve novel problems through planning approaches to complex tasks (executive functioning), keep important facts in mind as we solve problems (working memory), process information in an effective way (inhibitory control), shift our mind's attention to parts of problems in an effective manner (attention shifting), and understand spatial relationships. For example, if you were shown a set of complex abstract figures that you had never seen before and told that they are part of a pattern varying in shadings, geometric shapes, and size, like Figure 5, and you were asked to describe what the next abstract figure in the pattern would be, solving this problem would engage your fluid intelligence skills. In fact, these kinds of pattern recognition problems are used to measure people's performance on tests of fluid IQ, the most commonly used being the Ravens Progressive Matrices Test. A real life application of fluid IQ would be the cognitive skills you would use if you planned an approach to solving a new and complex set of problems at the workplace. Many of the skills of academic intelligence regularly use fluid IQ capabilities.

Figure 5. Problems illustrating the Raven's Progressive Matrices Test

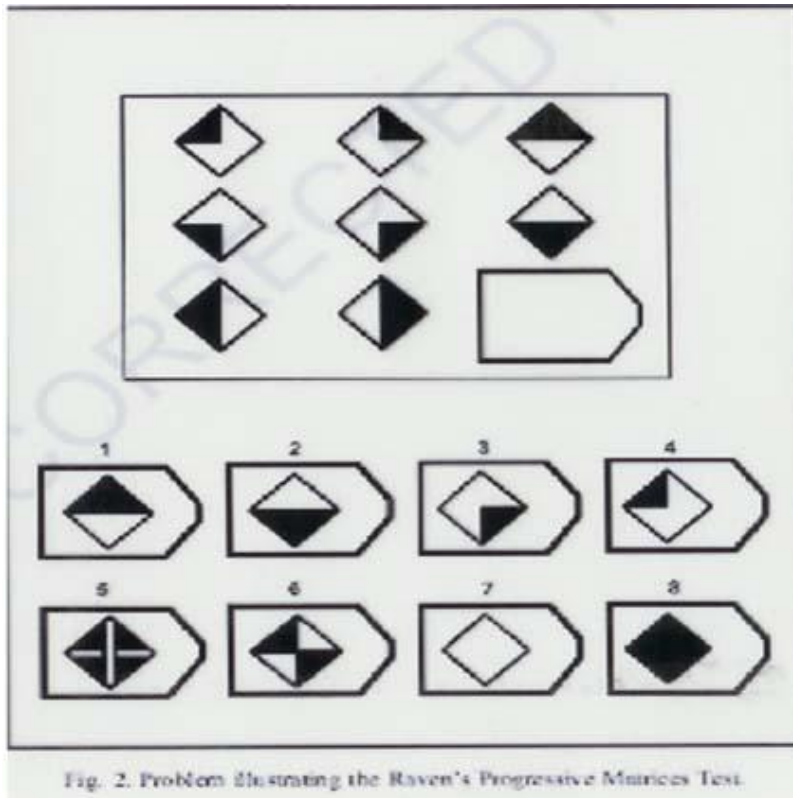


Fig. 2. Problem illustrating the Raven's Progressive Matrices Test.

The other set of cognitive functions, known as crystallized IQ, is made up of our abilities to remember and understand facts and routine solutions to problems that we have accrued over our lives. If you were asked, for example, to name the first four Prime Ministers of the 20th century, or how to calculate a sphere's circumference, solving these problems would use your crystallized skills (including realizing that you once knew the answers to these but now can't recall, although you do know where you can refresh your memory). While Flynn and others find some evidence of persistent, moderate rise in crystallized IQ across generations, it has been people's fluid IQ skills that have climbed through the roof over the past 100 years.

But what should we make of this? Is it really true that there are now many geniuses among us, or that in our grandparents' day most people didn't have the intelligence required to understand the rules of American baseball or British cricket? Obviously not. And at the same time, 80 some years is a short time in the whole of human phylogenetic development (ie as a species) over roughly 200,000 years, much too short for any kind of massive genetic selection resulting in superior human intelligence throughout the population. Instead all indications point to some impact of the immediate environment over the past century that has motivated and trained people's capacity for fluid, and to a lesser extent, crystallized cognitive skills.

Results of a recent set of studies indicate that mass schooling is a major cause of this growing IQ among successive generations. These studies were based on methods and ideas from an unusual combination of social and neuro-sciences that brought the neo-institutional analysis of schooling with exciting new findings and ideas about how the human brain develops and is transformed through everyday experiences in school (eg Eslinger et al, 2008).

The idea that formal education, spreading to ever wider proportions of the populations for increasingly longer times and with ever greater demands on people's attention, is a likely cause of rising IQ is a dramatic demonstration of the constructivist nature of schooling. Academic intelligence has become the central highly valued human skill of

the schooled society, a skill that just century ago would have been considered overly narrow and of dubious benefit to the functioning person. Over time, formal education has made this type of cognitive performance a much valued and necessary skill that all students are expected to master. Not the learning of facts, nor the rote application of methods to problems, modern mass schooling from Kindergarten to increasingly at the highest reaches of college and university has promoted the cognitive skills of academic intelligence as the primary learning goal of an education.

C. Implications for the Future: BCH Questions

The assumption behind the thoughts on each of these issues is that the second scenario above, the continued intensification of the schooled society, is the one likely to happen, and so it is the only one considered here.

- 1. Educational goals:** In these different scenarios how will the 'goals' of education change? What demands for qualification, socialisation and subjectification will there be as a result of these trends and in these different futures? What implications would there be for assessment practices?

The far more likely scenario of the continued intensification of the schooled society will not significantly shift educational goals from what they are now, but predicted here is an intensification and continued narrowing of goals. The goals of academic education for all students, the rise of education as human capital through human development will continue to grow and replace older notions of vocationalism and classicism, as well as the imagery of man-power planning (Baker and Lenhardt, 2008). Because of the early development of British education over the 19th century, ideas of elite and vocational education are embedded and could prove resistant to change. So, too, academic intelligence will continue to shape both the curricular objective as well as institutions such as the workplace and the labor market.

Also it is unlikely that the model of knowledge production through the super RU will decline in the foreseeable future; Mode 1 continues to be quite healthy. The super RU, and its components, appears not to be a fad. The model of the super RU has spread across many nations as at least an aspiration, if not a full-blown plan. If British educators and higher education officials incorporate this model in future plans for higher education, this will greatly enhance the nation's educational and knowledge production competitiveness into the future.

- 2. Educational 'personnel':** Who will be teaching/learning/mentoring/caring in the light of these trends and in these different futures? How will risk to each of these different groups be exacerbated or reduced in different futures?

Teachers will be asked to be ever more academic in their approach, yet to a much wider variety of students from all kinds of backgrounds and with all kinds of strengths and weaknesses. This paradox creates much of the stress in teaching. If it is made explicit to all involved some of the stress can be overcome. Obviously as the demands of academic intelligence and schooling in general rise and more of the populations of children and youth are asked to succeed at these for longer periods of their lives, more are at risk of needing more intensive remedial education. The increase and penetration in to all facets of schooling of the American special education for academic at-risk students is a consequence of this.

The universities too will experience the same. As described in section II A above, the support for the massive resources needed for state-of-the-art knowledge production will increasingly depend on wider societal support of higher education in general. This means that teaching in the university will need to change in the direction of student-centered, with abundant remedial opportunities.

- 3. Educational institutions:** Given these trends and potential scenarios, how might education be organised and governed? What accountability measures could be considered? What organisational and institutional structures become possible?

In many ways this is obvious from the description of the schooled society above. One clear institutional implication of the knowledge production conglomerate and the super RU is that widespread Mode 2 knowledge production has not happened, or at least it has not reduced the role of the university as was originally predicted. The need for wide societal support of knowledge production melds together more access to the university and science and scholarship. The logic of the old organizational arrangement of breaking off research into non-university organizations that was so popular in Western Europe is not likely to be the best way to do this; in fact these arrangements as supported by elite scientists and scholars of these institutions, are likely to retard societal support in that they detract from the symbiotic process of mass education as the platform upon which a knowledge society is sustained.

So, too, accountability, at both the schooling level and in higher education (within the next few years there will be a PISA-type comparison of higher education students cross-nationally), will need to focus more on the ability of schools and universities to provide academic type training to all children and youth. In other words, the standard of successful education narrow and intensify around academics too. Different objectives for different people will continue to die out as a value, and will be replaced with the notion of the use of academically-based education as the only way to assist in the general human development of all the nation's children and youth.

- 4. Educational methods:** Given these trends, how might learning best be supported? How might teaching best be enabled? How might we best assess the outcomes of these methods? What evidence do we have now that could be mobilised to respond to these trends?

Most germane here is the implication of rising and intensifying academic intelligence as the main object of schooling from the earliest years on. This trend will in the future put even greater pressure on educators to devise methods to assist all learners to master these cognitive skills. The intensive narrowing focus on these skills will make a major social problem out of those who cannot master these skills. This will be a formidable challenge for formal education into the future.

- 5. Educational tools:** In these different scenarios, what artefacts (material, conceptual, knowledge-based, technical) will we be able to employ in support of education and assessment? What interventions and practices that we see in education now could give us insight into how we might use these artefacts in future?

It is a reasonable prediction to make that the continued cognitive-ization of educational materials will occur well into the future. The same is true of new knowledge in general. Educators, teachers and professors alike, will need to be trained in these ideas. Right now in the US, for example, most teachers and professor (other than psychology professors) have a rather crude introduction to the ideas and findings of the cognitive revolution in the study of the human brain and mind and its capabilities. This is a limitation that needs to be addressed.

- 6. Educational outcomes:** In these different scenarios who will benefit? Who will be at risk? What interventions could be designed to enable equity of outcome?

Thoughts on this are covered in sections 2 and 4 above.

- 7. Beliefs about education:** In these different scenarios, what views might the wider public have about the goals and aspirations of education? What different approaches to education might they more readily accept or reject? This area has been added after discussion with the EAG, and will be considered not only through the Challenges but also through the Public and Stakeholder engagement programme.

Thoughts on this have been covered in I and II A above.

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