



The Worldwide Expansion of Education the Past Half-Century and its Impact upon the Global Economy

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Introduction

The past half-century has been witness to the largest education expansion drive in human history; as a worldwide education expansion project played itself out. This expansion has taken up a significant proportion of resources of nations. In the case of the developing countries education is almost invariably the biggest item on government's expenditure budgets. In the case of the United States of America (USA) federal funds allocated to education rose tenfold in the thirty year period 1970 to 2000, from US\$ 9.2 billion to US\$ 90.6 billion (Ornstein & Levine, 2003:241). One major motivation for this concentrated employment of resources is the belief that investment in education promotes, or indeed is a *sine qua non* for economic growth (*cf.* Bloom, 2004). Testing this supposed relation, especially in the contemporary era, is therefore timely. The aim of this article is to investigate the co-variation between education effort (measured in terms of enrollment ratios) and economic performance (measured by *per capita* gross domestic product) of the various countries of the world; and to compare the results with that of a similar exercise conducted by Harbison and Myers (1964), almost half a century ago; at the outset of the massive education expansion drive which took off during the second half of the twentieth century. The article commences with an outline of the rationale behind the education expansion and by a

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depiction of the extent of the international education revolution. That is followed by an explanation of the research methodology and a summary of the study of Harbison and Meyers. The findings of the research done for this article are then presented and discussed.

The underlying motivations for the global education expansion drive

A host of reasons lie behind the worldwide education expansion project. These could be classified as political, social and economic. Political motivations include not only the rising creed of human rights (with the right to education regarded as a central human right), but also more mundane political goals education has been widely believed to be instrumental to achieve, such as moulding national unity (*cf.* Cowan et al., 1968), entrenching democracy (*cf.* Boli & Ramirez, 1902:32). Social motivations include the beliefs in education as agent of (individual and group) social mobility and of effecting modernization (*cf.* Fägerlind & Saha, 1984).

Besides all these motivations, however, a strong consideration was the contention of education being a catalyst of economic growth. Way back in the eighteenth century already, Benjamin Franklin (1708-1790) was the first American to highlight the practical role of (vocational) education for the promotion of agriculture, commerce and industry (Kerr, 1969:302). Idenburg (1975:44) draws attention to the changes in the structure of economic activities in the developed countries during the past few centuries. Manufacturing industries first and later the service sector took over from agriculture as the mainstay of the economy. Furthermore, in all sectors science and technology increasingly show their impact on the production process, which became more and more mechanised and automatised. These changes had a strong influence on education. The demands posed to knowledge and intelligence has been on an ever-upward trajectory.

During the decades after the Second World War, economists occupied themselves with the economic value of education. In their investigations they have followed especially two lines of inquiry, namely the macro-economic and the micro-economic methods. In the first line of inquiry, they investigated the causes of increased economic production. After all other input factors have been accounted for; the residual has been ascribed to the quality of labour, or the level of education of the work force (Idenburg, 1975:52).

Turning to the second line of inquiry, here individual rates of return for various education levels were calculated (Thurow, 1977:325).

The post-Second World War proclamation of the economic value of education by economists, culminated in Theodore Schultz's human capital theory. Schultz, Economics professor at the University of Chicago and winner of the 1979 Nobel Prize for Economic, formulated in his 1960 Presidential Address to the American Association of Economists his Theory of Human Capital as follows:

“Although it is obvious that people acquire useful skills and knowledge, it is less obvious that these skills and knowledge are a form of capital, that the capital is in substantial part of a product of deliberate investment, that it has grown in Western societies at a much faster rate than conventional (nonhuman) capital, and that its growth may well be the most distinctive feature of the economic system. It has been widely observed that increase in national output have been large compared with the increases in land, man-hours, and physical reproducible capital. Investment in human capital is probably the major explanation for this difference” (Schultz, 1961:1)

Schultz's human capital theory resulted in a revolution in economic thinking (Sobel, 1982). At about the same time when Schultz formulated his theory, Harbison and Myers (1964) published their study (to be explained more fully in a later section in this article).

The worldwide education expansion project

The global enrolment growths at primary, secondary and tertiary levels the past half century are presented in table 1.

Table 1 Enrolments growths over the past half century

Enrolments worldwide (X000)					
Year Level	1960	1970	1980	2000	2008
Primary	246 059	340 054	417 522	649 189	696 437
Secondary	68 217	121 553	177 185	404 087	525 665
				1999	

Tertiary	12 224	28 142	45 942	93600	158700
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(Sources: Coombs, 1985; UNESCO, 2011).

Progress in enrolment ratios worldwide is presented in table 2.

Table 2 Enrolment ratio progress worldwide since 1960.

		Gross enrolment ratio				
Level \ Year	Year	1950	1960	1970	2000	2008
	Level					
Primary		60	72	84	92	97
Secondary		12	21	33	60	67
Tertiary		1	4	7	29	26

(Source: Ramirez & Boli-Bennett, 1982, UNESCO, 2011)

Research method

Almost fifty years after the study of Harbison and Myers (1964) (explained in the next action), this article reports on the recalculation of the statistical correlation between national enrolment levels and national economic strength measured by *per capita* GNP; using the most recent data. That figure is then compared to the one of Harbison and Myers (1964), calculated with data fifty years ago. That is followed by a discussion of the nexus between education and economy in the various categories (according to economic strength), and these are also compared to the results of a similar exercise done by Harbison and Myers (1964)/

The Harbison and Myers study

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Harbison and Myers (1964:1) commence their publication with the statement that modern nations depend on their development on a combination of factors which include capital, natural resources, foreign aid international trade. None of these factors, however, is as important as human capital, i.e. the education and training of the human resources input factor. Harbison and Myers therefore analysed development from the perspective of education. They calculated a correlation coefficient between education and economic strength, involving 75 countries. Education (as independent variable) was measured by means of the following composite index: (gross secondary school enrollment ratio) + (5x gross tertiary enrollment ratio). Economic development (as dependent variable) was measured by *per capita* GDP, measured in US dollars. The correlation coefficient for the 75 countries was found to be 0.88 (Harbison & Meyers, 1964:88). On the basis of the composite index, they classified countries into four levels of human resource development

- level I: Underdeveloped: composite index under 10
- level II: Partially developed: composite index 10 to 32
- level III: Semi developed: composite index: 33 to 74
- level IV: Advanced: composite index: 75 plus

Subsequently they focused upon each category. The level I countries (see appendix 1 for list) had annual *per capita* incomes less than US\$ 85. They were mostly agrarian societies, mostly rural populations engaged in subsistence agriculture. There were little industries (secondary economic activities). The largest single category of (indigenous) high level human resources were teachers. Other than that, most high level skilled personnel in the public as well as in the private sector. Education reached only a small percentage of the population, and its quality was low. Primary education enrolment ratios were mostly less than 20 percent. Secondary education was available only to children of wealthy classes, and the bulk of secondary school students were in the academic stream. As a strategy for the human resource development of these countries Harbison and Myers (1964:64-71) recommend the expansion of secondary education; a program of formal adult education, and a comprehensive non-formal training strategy using major government and private enterprises as sites for such on-the-job training.

The partially developed countries (level II) were mostly agricultural economies, with 65 percent of their active population engaged in agriculture (in the case of level I

countries it was 83 percent), but probably less than half of the rural population might have been engaged in subsistence activities (Harbison & Myers, 1964:74). The industrial sector was sizeable, though mostly limited to those directly linked to meaning and petroleum companies. The general annual *per capita* income of US\$ 180 was twice that of the level I countries. Turning to human capital resources, they had little difficulty to fill, from local sources, requirements for administrative personnel and primary school teachers. Local nationals were also firmly in control of government positions, and in most of the countries' industrial and commercial establishment they held firmly high positions. Primary schools were attended by more than half of the relevant age cohort. A bottleneck existed in the transition from primary to secondary schools, and the quality of secondary education was low. In contrast to level I countries, these countries had their own universities. Their biggest needs in terms of human resources development were, according to Harbison and Myers (1964:90-94) on-the-job training, eliminating adult illiteracy, adult education for community development, and especially for agricultural development.

Countries in the semi advanced countries (level III) category could produce practically all the high-level human resources which they needed. The quantity and quality of such high level human resources, was well below that of the level IV (advanced) countries. Industrialization was well advanced, and transportation, power and communications infrastructure well develop. Government was no longer the largest employer of skilled human resources. Average annual *per capita* GIVP was US\$ 380, a third more than that of the level III countries Universal primary school had been achieved. Secondary education was still narrowly academic and primarily university oriented; with only a minority of the population exposed to it. From the ratio of professionals to technicians it seemed as if production of the latter were lagging behind. Apart from the need to expand and to broaden secondary education and to step up the production of skilled technical personnel, Harbison and Myers (1964:125) advocated vocational (agricultural) education - the increase of agricultural productivity (on average half the active population of these countries were still engaged in agriculture), should receive attention, as well as the development of research capacity; as these countries were still dependent upon scientific discoveries and technological advances borrowed from the advanced (level IV) countries.

Advanced countries (level IV) had advanced industrial economies. They were capable of making major scientific, technological and organizational discoveries and innovations. They had a large stock of high level human resources. Universal primary

education had been achieved and they were approaching university secondary education attendance. Gross tertiary education enrollment ratios varied from 6.1 percent in the case of West-Germany to 32.5 percent in the case of USA. Upon formulating a strategy for the further development of human resources, Harbison and Myers (1964:166) noted that these countries were under continuous pressure to innovate and to make new discoveries in science, technology, management, public administration and social and economic policy. Secondly Harbison and Myers (1964:168) recommended that the higher education systems of these countries ought not to be so narrowly focussed on training specialists for scientific and technical positions. The future scientist and engineer ought to have a greater understanding of the interrelationships between science, technology and society. Finally Harbison and Myers (1964:171) that adult education systems be set up to train adults for new jobs in an ever faster changing society.

Findings

For 167 countries which data were available the composite index was calculated, using the latest data available (2011). These calculations are shown in appendix 1. The correlation coefficient between the composite enrollment index (independent variable) and annual *per capita* GNP was also re-calculated, using the latest available data (2011). This was found to be 0.657. This represents a weakening from Harbison and Myers' 0.888; though it remains strongly positive. When the composite index values of 1964 are compared with that of 2011, the size of the global education expansion effort the past half a century could be appreciated. As far as development of educational enrollment is concerned, no country is left in level I (underdeveloped); while the bulk of countries are now in level IV (advanced) – in 1964 reserved for the most developed economies. However, not all of this has transpired into economic growth. When the countries of advanced education enrollment (level IV) are analysed in terms of levels of economic development (as classified by the World Bank, *cf.* Appendix 2), it appears that countries along the entire spectrum of economic development now lie in level IV, although, as suggested by the 0.657 correlation, there is a trend for more developed countries to be concentrated to be concentrated in level IV. By closer inspection, no single factor accounting for these differentials could be funded. It is probably the combined effect of a number of factors. The interplay between education and the following possible factors, each singly and in conjunction, could well be investigated and would constitute a valuable follow-up to the research presented in the article.

- the quality of education
- the nature of education (e.g. academic or vocational)

Contextual factors

- political factors (democracy, turmoil)
- economic factors (economic policy, incidence of corruption, availability of natural resources)
- values of society

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South Africa	40.0	Hungary	53.9	Uruguay	69.8	Cambodia	3	Swaziland	62
Egypt	40.1	Taiwan	53.9	Norway	73.8	Pakistan	4	Cameroon	69

Appendix I Classification of countries
according to composite index of secondary and
tertiary enrolment ratios

Harbison and Myer calculation (1964)

Present calculation (2011)

Level I Underdeveloped

~~Niger~~ IV Advanced 0.3 Tanganyika 2.2 Nigeria 4.95

~~Ethiopia~~ 77.75 ~~USSR~~ Ivory Coast 2.9 2.6 ~~Haiti~~ 15.37

~~Norway~~ 79.22 ~~Canada~~ Northern Rhodesia 101.6 2.95 ~~Australia~~ Senegal 15.45

~~Argentina~~ 82.05 ~~France~~ Congo 107.8 3.55 ~~New Zealand~~ 147.3

~~Somalia~~ 84.9 ~~Japan~~ Liberia 111.4 4.1 ~~USA~~ Sudan 261.3

~~Afghanistan~~ 85.8 ~~UK~~ Kenya 121.6 4.75

~~West Germany~~ 88.7 ~~Belgium~~ 123.6

Level II Partially developed

Guatemala 10.7 Iran 17.3 Lebanon 24.3

Indonesia 10.7 China 19.5 Ecuador 24.4

Libya 10.85 Brazil 20.9 Pakistan 25.2

Burma 14.2 Colombia 22.6 Jamaica 26.8

Dominican Republic 14.5 Paraguay 22.7 Turkey 27.2

Bolivia 14.8 Ghana 23.15 Peru 30.2

Tunisia 15.25 Malaya 23.65 Iraq 31.2

Level III Semi-advanced

Mexico 33.0 Portugal 40.8 South Korea 55.0

Thailand 35.1 Costa Rico 47.3 Italy 56.0

India 35.2 Venezuela 47.7 Yugoslavia 60.2

Cuba 35.5 Greece 48.5 Poland 66.5

Spain 39.6 Chile 51.2 Czechoslovakia 68.9

Laos 76 Tunisia 207 Kazakhstan 338

Nigeria 95 Colombia 210 Austria 34.5

Bangladesh 86 Malaysia 215 Germany 350

Namibia 88 Macedonia 219 Japan 362

Myanmar 93 Armenia 221 Hungary 363

Yemen 93 Turkey 225 Israel 378

Morocco 102 Philippines 229 Ireland 384

Botswana 104 Egypt 232 Libya 384

India 107 Niger 107 Dominican Republic 233 France 385

Mozambique 120 Moldova 234 Portugal 389

Iraq 123 Hong Kong 245 Canada 390

Vietnam 123 Afghanistan 18 Jordan 253 Italy 394

Indonesia 142 Burundi 22 Slovakia 262 Belarus 398

Trinidad and Tobago 144

China 145 Thailand 262 Poland 400

El Salvador 150 Rwanda 263 Argentina 404

Nicaragua 154 Romania 265 Russia 410

Saudi Arabia 154 Venezuela 267 Netherlands 412

Eritrea 158 Czech Republic 28244 Nepal 476

Azerbaijan 158 Croatia 283 Ukraine 423

Uganda 162 West Bank and Gaza 28451 Spain 437

Mauritania 163 Kyrgyz Republic 28852 Lithuania 447

South Africa 165 Mongolia 288 Latvia 450

Guinea 176 Bolivia 294 Greece 456

United Arab Emirates 176

Ethiopia 79 Uruguay 29657 Denmark 462

Jamaica 8

High Income countries (annual per capita GDP US\$ 12 196 and more)				Algeria	181	Panama	300	Slovenia	464
Australia	Germany	Mexico	189	Chile	Sweden	303	Belgium	465	
Austria	Greece	Brazil	190	Bulgaria	Switzerland	304	New Zealand	479	
Belgium	Hong Kong	Netherlands	192	Switzerland	Trinidad and Tobago	318	UK	485	
Canada	Hungary	Norway	194	Lebanon	United Arab Emirates	329		505	
Czech	Ireland	Romania	200		United Kingdom	Norway		514	
Denmark	Israel	Portugal			USA				
Estonia	Italy	Saudi Arabia					Australia	524	
Finland	Japan	Slovenia					Korea (South)	536	
France	Korea South	Spain					Sweden	547	
							Finland	562	

Appendix 2. Level IV countries on composite enrollment index's (cf. appendix 1) position on World Bank's classification of economic development

Low Income countries (annual per capita GDP US\$ 995 or less)

Bangladesh	Kyrgyz	Myanmar
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Low-Middle Income countries (annual per capita GDP US\$ 996 to US\$ 3 945)

Armenia	India	Morocco	Thailand
Bolivia	Iraq	Nicaragua	Tunisia
China	Jordan	Nigeria	Ukraine
Egypt	Moldova	Paraguay	West Bank and Gaze
Georgia	Mongolia	Philippines	Yemen

Upper Middle Income countries (annual per capita GDP US\$ 3 946 – US\$ 2 195)

Albania	Colombia	Macedonia
Argentina	Cuba	Malaysia
Azerbaijan	Dominican Republic	Mauritius
Belarus	Iran	Mexico
Botswana	Jamaica	South Africa
Brazil	Lebanon	Turkey
Bulgaria	Libya	Uruguay
Chile	Lithuania	Venezuela

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