UNIVERSITIES AND 'RADICALISATION' IN THE MIDDLE EAST AND NORTH AFRICA*

Ortadoğu ve Kuzey Afrika'da Üniversiteler ve Radikalleşme

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Abstract

The purpose of this study is to examine a little about the business of what we call – rather unsatisfactorily – radicalisation, on university campuses. I shall focus on mainly about the Middle East and North Africa, though I hope my remarks have wider relevance. I want to reflect a little on what it is about university education that encourages and discourages radicalisation. It is true that the mere fact of bringing young people together in large numbers, at a moment in their lives when they are idealistic and impressionable, has its own dangers, but if this can sometimes lead to extremist influence and even recruitment, it is in large part a matter of university discipline. There are more important themes, in my view, in the actual business of university teaching – and it is this that I would like to see more widely understood. In this study, I will try to explain that university youth struggling with radicalisation in some perspectives. To do so, the study consists of observations about radicalism in universities and universities youth.

Keywords: Radicalisation, Violent Extremists, Engineering and Radicalisation, Middle East, North Africa

Öz

Bu çalışmanın amacı üniversite kampüslerinde radikalleşme olarak adlandırılan konu hakkında inceleme yapmaktır. Yapılan açıklamaların daha geniş alanda alakalı olmasını umut etmekle beraber, genel olarak Orta Doğu ve Kuzey Afrika' ya odaklanılacaktır. Radikalleşmeye teşvik eden ve tam tersi etki yaratan üniversite eğitimi hakkında bilgi vermek istemekteyim. Üniversite çağındaki genç insanlar hassas ve kolay etkilenebilir zamanda

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olduklarından onları üniversite ortamı olan kalabalıkla bir araya getirdiğimizde, bu onların kendi tehlikeleri olmaktadır. Ancak, bu durum bazen radikalleşmeden etkilenme ve aşırıcılığa katılma olsa da, bu daha çok üniversite disiplinin bir sorunudur. Benim anlaşılmasını istediğim üniversite öğreniminin daha fazla önemli konuları olduğudur. Bu çalışmada üniversite gençliğinin radikalizm ile mücadelesini bazı bakış açılarından açıklamaya çalışacağım. Bunu gerçekleştirmek içinde, üniversitedeki ve üniversite gençliğindeki radikalizmle ilgili bazı gözlemleri çalışmada açıklayacağım.

Anahtar Kelimeler: Radikalleşme, Aşırıcılık Yanlıları, Mühendislik ve Radikalleşme, Ortadoğu, Kuzey Afrika

Introduction

It is notable that when we talk about a connection between education and 'radicalisation,' there is a strange assumption that we must be talking about a connection between *lack* of education and radicalisation. Although academic researchers have paid a lot of attention to the much more interesting and sometimes surprising connection between higher education and violent extremism, more popular analysis continues to examine the assumption that poor education conduces to radicalisation.

About a month ago, the British newspaper the *Guardian* ran a report by Jason Burke headlined *Islamic militant groups' recruits likely to be well educated, study finds* (Burke, 2016). World Bank analysts, looking at internal *Daesh* recruitment records acquired by German BKA [*Bundeskriminalamt,* The Federal Criminal Police Office of Germany], covering 3,803 foreign recruits to the *Daeshi* jihad, were able to do some fairly fine-grained analysis. The research will, according to the *Guardian* – and I am quoting Burke here - "reinforce the growing conclusion among specialists that there is *no* obvious link between poverty or educational levels and radicalisation." The World Bank study found that 69% of recruits reported at least a secondary level education while "15% left school before high school and less than 2% are illiterate". The educational level of recruits from North Africa or the Middle East was significantly greater than that of most of their compatriots, the researchers found. "A large fraction have gone on to study at university … Recruits from Africa, south and east Asia and the Middle East are significantly more educated than individuals from their cohort in their region of origin (Burke, 2016).

This certainly doesn't support the odd assertion that "there is no obvious link between … education levels and radicalisation." In using these figures to contradict a correlation with *low* educational achievement, the author downplays the correlation with *high* educational achievement – or at least with progression beyond school.

It is the product of an easy assumption that poverty and lack of education lead to desperation, and that desperation coupled with a sense of 'nothing to lose' is a motor for terrorism. As Claude Berrebi put it in a 2007 paper, "the intuitive expectation is for terrorist organizations to be populated by individuals who have the lowest market opportunities." He stresses that this understanding has been widely accepted – and many commentators quote Eli Wiesel who famously wrote, "What is it that seduces young people to terrorism? It simplifies things. The fanatic has no questions, only answers. Education is the way to eliminate terrorism." (Jai, 2001). Berrebi quotes frequent couplings by politicians and statesmen of 'poverty and ignorance' in accounting for radicalisation and terrorism; and there is a widespread, attractive and plausible assumption that education, *tout court*, is a powerful answer to terrorism (Berrebi, 2007).

Education, Radicalization and the Evidence

But the evidence doesn't support this conclusion, as the World Bank report figures cited by the *Guardian* make clear (World Bank MENA Region, 2016). An intriguing chart in the report itself shows that in every single case except that of those coming from Eastern Europe, the average number of years of education of *Daeshi* recruits *exceeds* the regional average for their region of origin. This is most marked in North Africa (where the difference is 3 years of education), Sub-Saharan Africa (5 years) and the Middle East (3 years); Western Europe shows a difference of 2 years. "We find," write the World Bank report's authors, "that Daesh did not recruit its foreign workforce among the poor and less educated, but rather the opposite" (World Bank, 2016).

There is no evidence published in the report allowing a comparison specifically of the proportion of university graduates between *Daesh* and the wider regional population, but research published by Diego Gambetta and Steffen Hertog in 2007 found that almost half (48.5 percent) of *jihadis* recruited within the MENA [Middle East and North Africa] region prior to that date had higher education of some sort, and that "the over-representation of university-educated in our sample relative to the general population of their countries is significant." (Gambetta and Hertog, 2007). A sample

examined by the *Centre for Religion and Geopolitics* in 2016 found that 46 percent had attended an Higher Education institution, though 22% had dropped out without completing (Ahmed, et al., 2016). This can be broadly compared with a regional mean figure of 25.8 percent gross enrolment in tertiary education, a figure which, broken down between the four major 'suppliers' is (or rather was at the time of the research) 32.6 percent in Egypt, 10.6 per cent in Morocco, 28.6 per cent in Tunisia and 27.7 percent in Saudi Arabia (World Bank, 2008). Jihadism is, it seems, a profession that attracts graduates. Accordingly, the first observation is that – perhaps counterintuitively - those who have attended university are in relative terms more likely than the general population to become 'violent extremists.'

This question has been widely discussed by researchers, much of whose emphasis has been on trying to work out how education and the conditions of a specific society interplay. For example, Brockhoff et al. (2015: 1207) analysed 133 countries over 23 years and concluded that "education at lower levels (primary education) leads to more terrorism for a cluster of countries where poor [socio-economic, politico-institutional and demographic] conditions abound, while high level education (university education) reduces domestic terrorism for a cluster of countries where conditions are more favourable." This makes sense: where societies are able and willing to respond to the growing expectations of an increasingly educated population, allowing those expectations to drive change, it can well be positive: where they can't, or won't, respond to that growing level of expectation, pressure for forced change builds up – or as the economists have it "due to poor country-specific circumstances, advances in education may not sufficiently increase the opportunity costs of terrorism, because the relevant transmission channels do not work properly" (Brockhoff, et al., 2012).

Education in the Middle East and North Africa

In the background to this debate is the huge expansion – what the French call *massification* – of higher education across the world, in countries at each end of the scale set out in the paper I have just been discussing. It's worth pausing to look very briefly at the growth of Higher Education in the recent past. Universities today are very different to the institutions that my generation, whether in Europe or the Middle East, attended. Between 1992 and 2012 the world's student population rose from 14 percent to 32 percent of the relevant age-group. The number of countries in which that proportion passed 50 percent rose from five to 54 (The Economist, 2015). Raw student numbers worldwide, 105 million in 2002, are expected to more than double again in the 13 years 2012-25, reaching 262 million (Maslen,

2012). A higher and higher proportion of the world's young population is passing through universities, and as well as centres of creativity, innovation and improved life-chances, they are inevitably also becoming focuses of disappointment, when the outcomes do not match the expectations and hopes raised.

This growth in numbers is visible in Europe – in Britain, the proportion of young people in university has gone from 3.4 percent of the age-cohort in 1950 to almost 50 percent today. Such growth is piously and generally (though not necessarily correctly) held to be a good thing – and the positive correlation between a rising percentage of graduates in the population and economic development is assumed to be causal. However, there are clearly by-products not just in the *unemployment* of graduates, but also in their *under-employment* – the colonisation of unskilled jobs by graduates unable to find skilled work. In the United Kingdom in 2015, 30.8 percent of young graduates were employed in unskilled jobs, and 13.4 percent were either unemployed or inactive (gov.uk and Times Higher Education, 2015). This is true too in much of Middle East and North Africa and across the world – and it will get much worse as student numbers continue to explode.

The question of why this is so, is hard to answer precisely. Important, though, is the fact that throughout the region, so overloaded and even broken is the higher education system and its relationship with the wider national economy, that (unlike in most of Europe) in almost every country in MENA a university degree today *reduces* rather than increases the chance of finding a job. This is of course not quite as simple as it sounds, because the graduate's expectation of a job is not the same as that of a primary school leaver – the graduate will often hold out for something that he or she considers 'appropriate.' Nonetheless, as a United Nations Development Program report in 2010 described the situation in Egypt, rather crisply, "It seems true that an educated person is at no advantage when it comes to finding his/her way in the job market. In fact, the opposite seems to be true" (United Nations Development Program, 2010). Across the region, 20-30 percent of graduates are unemployed (World Bank, 2013).

In Morocco it is common to hear the faculties of letters in particular described as *chantiers de chômage*, or 'factories of unemployment,' and brutal as the description is, it is all too often true. As the student population grows everywhere, so does graduate unemployment: many of the economies of the world are producing graduates much faster than they can create graduate jobs, and the result is frustration, bitterness and despair. It is logical to suppose that this pool of unemployed but educated people will

provide fertile possibilities for the recruitment of extremists. The argument goes that hopes raised and then dashed – particularly when education has historically seemed so sure a way to a better life – are motivators to radicalisation. It may seem logical, but has not been demonstrated, and in fact as we shall see, the courses of study which provide the largest numbers of violent extremists are those with the lowest, not the highest, unemployment rates.

Unemployment is significantly differentiated by subject. The massive expansion of Higher Education across MENA has been achieved by enlarging the numbers studying the humanities and social sciences (with their lower unit costs) much faster than those studying STEM [Science, Technology, Engineering, and Math] and medicine. This means, clearly, that the employment pressures on Social Science and Humanities graduates are greater than on their scientific and technical peers – hence the Moroccan quip about 'factories of unemployment.' And it coincides with reform and very significant contraction, right across the region, of the bloated civil services which have in the past been the main employers of humanities and social science graduates. Twenty percent of Egyptian men, and 50 percent of Egyptian women, born in 1978 found their first job in the public service: by 2009 those figures were 5 percent and 25 percent respectively (Egyptian Central Authority for Organisation and Administration, 2009).

Unsurprisingly, where we can differentiate, the figures are pretty clear: in Algeria, to take one example, the graduate unemployment rates are 28.7 percent in the social sciences, 27.3 percent in the humanities, 18.1 percent for scientists and 14.8 percent for engineers (Furceri, 2012). This is typical of North Africa. In Morocco, according to one leading authority, 80 percent of all graduate unemployed come from Islamic Studies, Arabic and the three school-teaching-orientated science courses, Chemistry, Biology and Physics (Guerraoui, 2013). STEM and medicine students are much fewer in number: across the region humanities and social sciences make up 63 percent of the student body, STEM students 23 percent and medical students 6.7 percent. The World Bank observes that STEM graduates are likely to be in higher demand because "scientists and engineers are likely to contribute more to economic growth than are social scientists or students of the humanities" (World Bank, 2008a). This is relatively, but no longer absolutely, true – unemployment amongst engineering graduates, while still comparatively low, is rising. The disparity of numbers and the differential unemployment might easily lead one to expect that levels of frustration and thus susceptibility to radicalisation, are higher amongst graduates in the humanities and social sciences.

This is not the case, and this perhaps counter-intuitive fact lies at the heart of understanding campus radicalization. A great deal of accumulating anecdotal evidence, and research by (among others[1]) Diego Gambetta and Steffan Hertog (2016), demonstrates fairly convincingly that STEM graduates in general, and (although this specific is disputed) engineers in particular, have slightly but significantly higher levels of recruitment to jihad than social scientists and humanities students.

As a consequence, the second observation is that unemployment, disappointment and frustration are growing amongst graduates; but that despite an intuitive causality, jihadi recruitment is not evenly distributed amongst graduates of different disciplines.

Education Field and Radicalization

The Gambetta and Hertog study (2016), called *Engineers of Jihad*, is fascinating and thought-provoking. It deserves to be dwelled upon because its implications rather than its arguments are most relevant. Essentially, they first demonstrate that engineers are over-represented: 44 percent of graduate *jihadis* recruited in the region, and 59 percent of those (many fewer) recruited in the West, had engineering degrees, and conclude that engineers "are over-represented amongst Islamic radicals by two to four times the size we would expect" (Gambetta and Hertog, 2016). Stephen Schwartz, examining the radicalisation of doctors, notes that "the radicalisation of Muslim doctors … is systematic" (Schwartz, 2008). They and other writers note a number of other interesting correlations: "though engineers," writes Gambetta, "are over-represented in both violent and peaceful Islamic groups, holders of 'Other Elite Degrees' (i.e. medicine and natural sciences) are much more strongly represented among the latter. Islamism seems to be appealing to both, but engineers seem much more prone to take the step to violence." A 2010 Demos report on radicalisation in the UK notes that "terrorists are more likely to hold technical or applied degrees – medicine, applied science, and especially engineering. [Non-violent] radicals by contrast were much more likely to study arts, humanities and social sciences" (Bartlett, et al., 2010). Finally (though there are many more examples) a Tunisian study published in 2015 recorded that "science rather than liberal arts students are more attracted to jihadist groups" – "according to the study," the commentator goes on, "students in mathematics and technology disciplines have the highest rate of recruitment to extremism – 19 percent, followed by natural sciences, chemistry and physics at

1 There is a useful literature review in Brockhoff et al., op. cit., p3-4

21 percent … and finally literature and law at the end of the list with 3.3 percent" (Sawahel, 2015).

It is probably worth setting aside (informative as it is) the apparent preponderance of engineers, because the educational point is just as well made by a broader group of disciplines – particularly STEM and medicine – 'elite degrees' that between them furnish the largest number of recruits; and this point has been made too for other countries, including, for Turkey in the 1990s, by Göle (1997: 56). The third observation therefore is that there is – for reasons to be established – a marked preponderance of recruits to radical violence, amongst graduates of technical and scientific faculties, and particularly engineers. I stress though that is not to suggest that there is some causal connection between engineering and radicalisation – though highly significant these figures are very small and the preponderance marginal: jihadists are often engineers, but engineers are very seldom jihadists.

Why is this so? Here we can follow Gambetta and Hertog a little way further, summarising their arguments. They suggest that there are various possible contributory factors. The prestige value of the medical, engineering professions in particular is probably important: graduates from these courses do represent something of an elite, often social as well as intellectual. In another recent study, Neil Ketchley and Michael Biggs find that "Islamists tended to come from university faculties admitting students with higher grades, and from faculties that recruited from students taking science rather than literature in secondary school," and thus trace back the 'Islamist elite' to school in a way to which I shall return in a moment (Ketchley and Biggs, 2015).

Gambetta and Hertog also suggest that the sociological history of the engineering profession in the region is important – the very fact that it has expanded so much since independence after the mid-20th century, and then contracted again, leaving those with the greatest feeling of achievement and entitlement most acutely disappointed and vulnerable. The Algerian sociologist Ali el Kenz calls the first generations of engineers "the spoilt children of the new states," suggesting the heightened disenchantment to which they are vulnerable when no longer "spoilt" (Kenz, 1995: 565-579).

But the most interesting passage in their analysis is about what they call the 'engineering mentality.' This is a synecdoche – a shorthand way of describing something bigger than just engineering. The concept is very simply that there is something in the way engineering in particular (but also other technical and scientific disciplines) are taught that conduces to a black-and-white, binary view of life. This has often been observed, and

one interesting instance is a British intelligence dossier Gambetta quotes, describing jihadi recruitment in the UK as seeking individuals who are "very inquisitive but less challenging," and noting particular attempts to recruit "people with 'technical and professional qualification,' particularly engineering and IT degrees."

Gambetta and Hertog (2016) find that there are three core characteristics of the 'engineering mindset (globally and in all cultures):' *monism*, *simplism* and *preservatism*, which they relate tentatively to characteristics of the thinking both of doctrinaire Islamists and of jihadis. "Whether American, Canadian or Islamic, and whether due to selection or field socialisation, a disproportionate share of engineers seems to have a mindset that inclines them to entertain the quintessential right-wing features of *monism* – 'why argue when there is one best solution' – and of *simplism* 'if only people were rational, remedies would be simple.'" As for *preservatism*, "its underlying craving for a lost order, its match with the radical Islamic ideology is undeniable: the theme of returning to the order of the Prophet's early community is omnipresent in most Salafist and jihadist ideology" (Gambetta and Hertog, 2008: 48-49). And exploring further the implications of this 'engineering mindset,' the former CIA analyst Marc Sageman adds: "The elegance and simplicity of [Salafism's] interpretations attract any who seek a single solution, devoid of ambiguity. Very often these persons have already chosen such unambiguous technical fields as engineering, architecture, computer science or medicine. Students of the humanities and social sciences were few and far between in my sample" (Sageman, 2004: 116). (Interestingly, Gambetta tentatively finds the opposite in left-wing extremist groups – an *over*-representation of social scientists.). The fourth observation, therefore, is that the so-called 'engineering mentality,' which I prefer to call 'binary' (because the label is unfair and perhaps unkind to engineers) is characteristic of those seeking extreme and often violent solutions; and that it is marked by an intolerance of ambiguity and nuance.

All this is very interesting, not just for what it tells us about engineers, but even more for what it tells us about higher education in the humanities and social sciences, and then about education in general. Because the opposite is also true. There is very little recorded recruitment from the arts and social science courses into the jihad – with the single exception of Islamic Studies, which is not really a social science at all (and provides fewer recruits than engineering).[2] There are very few humanities and social sci-

2 Interestingly, for Egypt, Ketchley and Biggs show that more graduate Islamists (their sample is of those arrested after the army coup against Morsi) in fact come from the traditional (and multi-faculty) religious university of al-Azhar than come from degrees in Islamic Studies at secular universities, well enough represented though the later may be.

ence students amongst identified graduate jihadis. Why? A former Muslim Brother quoted by Hisham Kandil in his book *The Muslim Brotherhood*, says, "In the social sciences one learns that someone made an argument, another criticized it; and history validated or disproved it. Questioning received wisdom is welcomed. In natural sciences by contrast, there are no opinions, only facts. This type of matter-of-fact mentality is more susceptible to accepting the Brotherhood's formulas which present everything as black or white." Kandil himself comments that "highly educated Brothers (including 20,000 with doctoral degrees and 3,000 professors) come overwhelmingly from the natural sciences … absent, however, are students of politics, sociology, history and philosophy" (Kandil, 2015: 34-35).

This is remarkable in itself, but the more so because these are precisely the disciplines that are most overcrowded, most underfunded and have the highest unemployment rates. The disciplines, in other words, from which on the face of it one might have expected disgruntled *jihadis* to emerge. But on the whole, they do not. This suggests that the humanities and social sciences, even when poorly taught in under-resourced universities, to uninspired students, have what we have called elsewhere the effect of 'immunising the mind' (Rose, 2015). This seems to suggest a powerful truth – that the training of students in handling ambiguity is a strong prophylactic against radicalisation.

Critical Thinking

In discussing this question, the phrase 'critical thinking' comes up regularly: we should, it is asserted, be training young people in 'critical thinking.' This is perhaps another way of saying what Kandil's Muslim Brother expressed in the pithy phrase "Questioning received wisdom is welcomed." If this is right, then the best possible preventative for jihadi recruitment is an open-minded, questioning education – a training in analysing, examining, weighing up and accepting or rejecting ideas. And this in turn means two things: firstly, that the social sciences and humanities deserve much more weight and funding than they have had in recent years; and secondly that engineering and the sciences need to be taught in a way that avoids binary yes/no answers, and encourages the interrogation of received wisdom through the philosophy and the sociology of science. Accordingly, the fifth observation therefore is that teaching in a way that encourages and prepares students to ask difficult questions, to question received wisdom and not to take No for an answer in the intellectual sphere, is effective and essential. This openness is indivisible, which can make it difficult for authoritarian regimes, whether secular or religious, to accept: but it is essential.

Openness is, however, the essence of education. Critical thinking is (or should be) absolutely fundamental to the Western university, and by analogy to universities across the world founded on the Western model, which is to say the great majority of Higher Education Institutions: universities exist to seek, to critique and constantly to redefine truth. And universities that aspire to being radically non-Western are not really any different. One Muslim writer on education puts it like this: "It is important that Muslims realise that knowledge is always a human construct that results from human beings' endeavours to understand the world. The classical knowledge that is based on the Islamic epistemology … is not absolute and unchangeable;" (Hussein, 2007: 49-58) or, in the words of Ziauddin Sardar, "Ideology is the antithesis of Islam. It is an enterprise of suppression and not a force of liberation. Islam is an invitation to thought and analysis, not imitation and emotional following" (Sardar, 2003: 171).

We suggest that the key to equipping young people to resist the facile simplicities of radicalisation is not (as often suggested) an ever more intense effort to teach them what are thought of as the *right* answers, the *right* ways of thinking, in order to keep them from the *wrong* way; but that it lies in equipping them to think for themselves. There is much talk of teaching 'values' and 'tolerance,' and while these are in all sorts of ways very good things, we doubt that alone they offer a very effective prophylaxis against radicalisation. For a start, they are always swimming against the tide. I would suggest that most MENA education systems have gone down a dangerous path which has had the effect of closing down, rather than opening up, the creative enquiry that should stand at the heart of education. The emphasis that the Arab Human Development Report (AHDR) notes on "submission, obedience, subordination and compliance" has left the Arab World with education systems that by and large replicate the form of Western systems, but without their (far from uniform) creativity, adaptability, resources or focus on the individual student (Arab Human Development Report, 2003: 53-54). The result is not good – indeed, as we see, it can be very dangerous.

That the ossification described by Arab Human Development Report in 2003 is through no desire of the students, is suggested by (among other evidence) a piece of research undertaken in Saudi Arabia in 2011. In the course of this study, researchers for Center for Strategic and International Studies (CSIS) asked a sample of 4,500 university students whether they agreed with the statement "Teachers should let us develop our own opinions and not push us in certain directions." Among the students polled, 91 percent of women and 87 percent of men agreed with the statement

(Schlaffer and Kropiunigg, 2011). This is a remarkable and positive expression of confidence and independence: although it may perhaps overstate the real appetite for uncomfortable challenge to received complacency, it is still an overwhelming vote for teachers to equip their students to think, rather than to tell them what to think – to teach them *how*, not *what*. Evidently they do not do so at present. The sixth observation therefore is that the strongest and most reliable way in which to equip young men and women to resist radicalisation is to teach them to think critically – to question received ideas.

As we have set out above, explanations for the way radicalisation seems to be concentrated in STEM, rather than Humanities and Social Sciences students, take two main forms. The first is that there is that the STEM and medical faculties are elite faculties, attracting the intellectual and social elite, and that these fortunate students are differentially affected by opportunity and disappointment. The second is that there is something intrinsic to the way the two groups of subjects are taught that forms different mentalities, and that these mentalities are more and less susceptible, when under pressure, to ideology of particular kinds. I shall end by suggesting a third explanation, which draws on both, but has to do with the entire educational philosophy and structure of states across MENA and beyond.

In all educational systems under consideration, the STEM and medical faculties form the pinnacle of the system – the focus of aspiration for the ambitious. Since Independence they have provided the route for consolidation of the social elite and to greater and lesser extents at different times, elevators for social advancement for those from outside the social elite. It seems very possible that the way school education is imagined and structured begins the formation of mentalities, just as it structures the elites. That, in other words, the whole business of aspiration from an early level of schooling is targeted at particular elite subjects; that these subjects are taught in such a way as to encourage binary thinking; and that the result is a scientifically and technically trained elite which – disenchanted by the attenuation of those elite life-chances – is already predisposed, through the binary nature of its intellectual training, to thinking in ways that are ideologically susceptible to radicalisation.

Right across the region, children in secondary school are divided into two streams. The ‘scientific stream’ under whatever name it is known, represents the ‘senior’ stream. It is smaller and generally better taught than the literature or humanities stream, and there is competition to get into the former, not into the latter. Writing of Morocco, Charis Boutieri describes the process of allocation.

> Every public high school has an Orientation Committee that organizes the transition from college to lycée and determines students' allocation into tracks and branches, Although students can declare their preferred track … it is the Orientation Committee which makes a decision based on each students' grades. Zineb was cognizant of the fact that even though the majority of students choose the scientific orientation, the committee prefers to push students with the lowest averages into the humanities track. Her parents fervently rejected the humanities option because they feared that a high school diploma in humanities and a university degree in Arab literature or Religious Studies would condemn Zinab to unemployment (Boutieri, 2016: 39-40).

In Egypt the final year school exam that controls entry to university is divided in two - "the science exam is considered the more difficult and thus more prestigious. Less accomplished students often take the literature exam. Some universities only admit students who have taken the science exam" (Ketchley and Biggs, 2015). And this situation is, broadly, replicated or paralleled across the region. These exams are life-defining, winner-takes-all events, and in many countries are therefore the focus of wide-spread cheating and corruption: passing them well is all that matters, so that the methodology of passing, of getting 'the right' answer, often in multiple choice formats, becomes central. From this fact radiates outward the binarism that we are discussing.

What is really very interesting is that researchers examining the distribution of 'radical Islamists' by subject in Egypt, find not just that there are a significant number of engineers and scientists – but that radicals come from *those faculties for which the secondary school science exam is a prerequisite*. "Islamist students come from the academic elite: those who gain higher grades, and who have studied science rather than literature *at secondary school*" (Ketchley and Biggs, 2015). They tend in other words to share the pedagogical culture of science from the region's schools.

My contention is that that culture tends to be a culture of binary answers, of right and wrong, a desperate reaction to the demands of a vast, baggy and essentially unreformed curriculum. Of course this is not always the case: there are remarkable, creative teachers in every nation and every culture. But the odds are stacked against them. One writer, again addressing Egypt, asserts that the unreformed curriculum, caught between traditional and modern, is so bulky and so unmanageable that "memorisation and teaching to the exam became the most reasonable means for muddling through the large quantities of material for which the student was responsible in high-stakes exams" (Moneim, 2016).

Attempts to change this teacher-centred reproductive culture of learning have not been successful. There have been initiatives in several countries to introduce child-centred teaching but they run against the habits, fears, economic interests and inherited prejudices of teachers. As the World Bank sums it up;

> In the late 1990s several MENA countries adopted pedagogical reforms with many of these characteristics (i.e. student-centred learning, competency-based curricula, and focus on critical thinking). Despite these efforts there is little evidence of a shift away from a traditional model of pedagogy. The main activities in the classroom in MENA continue to be copying from the blackboard, writing and listening to the teachers … Group work, creative thinking and proactive learning are rare (World Bank, 2008).

Conclusion

The seeds of susceptibility to radicalisation, at least in an intellectual sense, are sown in the school classroom. An education system – indeed a congeries of educational systems – progressively attenuate the possibility of the critical thinking that helps to immunize young minds against radicalisation. By the time they reach university, many of the brightest – elite – students have lost the critical open-mindedness they need to reject facile arguments. This is not about engineering, or science, or STEM. It is about the philosophy and practice of education at all levels that in selecting an elite, apply criteria that conduce to binary thinking.

The Vice-Chancellor of Oxford University, who is also a world-famous academic expert on terrorism, Louise Richardson, puts it as follows;

> Any terrorist that I have ever met through my academic work had a highly over-simplified view of the world, which they saw in black-and-white terms. Education robs you of that simplification and certitude. Education is the best possible antidote to terrorism *(*Addressing the Going Global conference, 2015).

Very few of those who go through such an education become radicalised – it is a marginal phenomenon. But the opening up of school and university education to critical thinking and encouraging the questioning of received wisdom is the way to minimise it. Quite apart from the wider benefits to free and democratic societies. Eli Wiesel was right – "The fanatic has no questions, only answers. Education is the way to eliminate terrorism." (Jai, 2011). But education in itself is not the answer: it needs to be the right sort of education.

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