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ORIGINAL ARTICLE

Educational change, inertia and potential futures

Why is it difficult to change the content of education?

Jón Torfi Jónasson[1]

Abstract The point of departure of the paper is that there are profound social, cultural, technological, scientific and environmental changes which occur at most local but also at global levels of the modern world. From these will stem huge challenges in all spheres of life. These demand changes in education, not necessarily in the system or how it operates, but perhaps in its aims, and most certainly in its content. Knowledge that was once powerful to understand the world, to develop as a person and address the challenges of life, should be replaced with new knowledge which may often be outside the traditional disciplines. Moreover, a host of new skills may be relevant for the world of tomorrow. There are, however, many obstacles to change, both reasonable and unreasonable ones. The thrust of the paper is to provide a discussion of nine categories of inertia or constraints that are seen to stifle change, in particular, as it relates to the content of education. The categories are discussed under the headings of general conservativism, system stability, standards, fuzziness of new ideas, the strength of old ideas, vested interests, teacher education, lack of space and motivation for initiative, and lack of consequence of no change. Added to this there are serious logistic problems for those who want to foster change. It is argued that very little change in content will be seen if these inertial constraints are not recognised. Assuming there is a will to change, the institutional infrastructures that should facilitate sustained change must be scutinised and it must be

ensured that the teachers, i.e. the professionals that operate the system, are involved.

Keywords Futures · Education · Aims · Curriculum · Change

✉ Jón Torfi Jónasson
   jtj@hi.is; http://uni.hi.is/jtj/en/

[1] School of Education, University of Iceland, Reykjavík, Iceland

Introduction

Should education change? Most people would say yes, but they are unlikely to agree about what should change or how changes in education should be brought about. The basic idea behind this paper is that there are enormous and diverse developments taking place in all spheres of life that call on education to take account. Not necessarily by changing its operational mode or procedures, even though this would probably make sense in some cases, but by changing its content in terms of the subject matter and skills it invites the students to master. But if convincing arguments can be found for such changes, would they be easy to implement? No, not at all. The focus of this paper is not on why change should take place within education or which should be the major changes, but on characteristics of the educational edifice that stifle, or impede change, in particular as it concerns the ingredients of education. We will explore the agents that seem to resist changes within this arena of education, or what constraints may be operating in terms of changing educational content. The rationale for the discussion is based on the assumption that the advocates of substantial development in aims or content will never get anywhere if they fail to understand and even sometimes respect the inertial constraints that prevent changes from taking place.

Assume that we could at some level provide a credible argument that the content of education should change, and also agree on – in very broad terms – what focus these changes should have in light of generally accepted aims. However,

noting how little change many aspects of education have seen, as demonstrated by Tyack and Cuban [1] in their discussion of the long history of well-argued reform efforts in the US during the 20th century it is clear that change is not easy to implement. According to Tyack and Cuban, many substantial and ambitious reform efforts were in the end not sustained. This inspires us to ask what can be changed, and no less importantly, what would hold changes back? Normally, "the future" we normally talk about is what we have already seen, but there is of course much more to it, as most future studies will make clear. Given our focus on the content of education, we seek to know how inertia can hold back changes in that arena. It seems that without a concise understanding of these issues, it will be difficult to engineer much change.

It might be assumed that a system that is in many ways geared to prepare people to participate in a constantly changing world would also change the material it uses at a similar pace, its curriculum - in the case of schools. Not necessarily the system itself, but what it does. Perhaps, but not necessarily, its aims, but certainly the content and the competences, i.e., the actual content of student's education. However, do the ingredients in fact change much? Despite attempts to introduce changes in the curriculum [2–4], as will be noted below, the impact of implementation seems to be marginal (see especially [2]), particularly when contrasted with the enormous changes in all spheres of life along with constant new explosions of knowledge. An objective metric for the amount and importance of the change achieved is, however, difficult to construct, but could be very valuable for this discussion (see a discussion on human rights education globally which moves towards a metric in [5]).[1] The system, its structure, its operation, and in particular its content, the curriculum (which is the focus here), seemingly remains sturdy, stable and fairly rigid.

The issue is partly about 21st century skills, new competencies, such as entrepreneurship and creativity and communication, and is generally about broadening the curriculum, both conceptually and in detail (that may be characterised as a progressive stance). But even more importantly it is about new content, new material, even new subjects that are driven by both new knowledge and new challenges. It is a question of the content of education, perhaps the powerful knowledge argued for by Young [6] and his colleagues (perhaps placed in a somewhat traditional camp). Powerful knowledge, according to Young, enables each and every person to understand the world and the challenges it presents and to develop as an individual, now and in the future. The sensible direction is some combination of subject knowledge and various

competences and new emphasis that serve one well in the modern world (see e.g., [2, 3] on serious attempts in this direction).

This paper is written as an overview that brings curricular theory or discourse to meet organizational and institutional theories, which touch the testing and accountability discourses, as well as the reform and change literature, all of which have to be activated in order to fruitfully frame the education discourses and developments and the potential for change in a world that is facing many possible futures.[2] It is meant to present a multitude of perspectives that seem to be largely missing from the educational discourse. The paper also emphasises that an overview is at times no less useful than probing an individual perspective in depth. Also, a crucial underlying assumption is that education, both as an institution and a potential social dynamic force, has to know about, understand and face the issues mentioned in order not to become obsolete. The eclectic approach presents a clarification of how the following list of challenges to educational development has come about and it reflects that fact that a lot of the educational change or reform literature is atheoretical, see e.g. Waks [7]. Much of what we develop here applies to reforms or developments in general, but our focus is not on the what people most often refer to when they talk about reforms or change, i.e. not about how school systems are organized, how schools are funded or chosen, or how testing or evaluation systems should be developed, i.e. the topics of much of the standard literature [8–13] and none of which may move our education into any of the futures we may envisage. The focus here is on a crucial facet of education, its ingredients.

Education should concern itself with possible futures

There is certainly more to education than focusing on future perspectives, but it should not be neglected in the sense and to the extent that it has been.

There are certainly efforts being made within Europe to broaden the school curriculum, set to ensure that a future perspective is seriously reflected therein. The European Union has developed these efforts in its *Lifelong learning* discourse, where it has suggested eight key competencies explicitly geared towards the coming decades [14]. These are, communication in the mother tongue; communication in foreign languages; mathematical competence and basic competences in science and technology; digital competence; learning to learn; social and civic competences; sense of initiative and entrepreneurship and cultural awareness and expression. These

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[1] This statement brings in the whole discussion about massive developments in all walks of life which can imply a multitude of futures and challenges that the young generations have to tackle. But the detailed argument is intricate and will not be developed here.

[2] The paper is intended to bring into the academic discourse issues that the author, who has been concerned with all levels of education, in particular teacher education, often in an international context, is convinced that need to be discussed within academia from a wide perspective. That explains the discursive speculative style.

competencies echo those presented in a number of national and international documents. The Nordic countries[3] have also reflected these aims in their national curricula. The same holds for countries within the British Commonwealth, as discussed by Sinnema and Aitken [15], who note the general emphasis on "competencies, pedagogy, values, student agency, partnerships and reduced prescription", which are meant to underpin the goals of "improvement, equity, future relevance and coherence" [15, p. 156]. Indeed, several nations are working towards kindred goals, see e.g. Reimers and Chung [2], where efforts in this direction in six[4] nations are described and related to possible future settings, noting that the relationship between intention and implementation is most often weak, which indicates that introducing a new curriculum is a slow process. It is probably safe to assume that in most countries there can be found considerations along the lines described for the six countries. Yet normally two questions are not being addressed systematically. One question concerns the efforts actually being made to seriously, and formally, gauge possible futures in order to provide novel input into the curricular discussion. The other concerns the various influences that dampen, impede or stifle change, even when the arguments for it have considerable strength.

At the international level serious efforts have been made to discuss future challenges as they relate to education. Some years ago, we had the Faure [16] *Learning to Be* report and then the Delors [17] report, *Treasure Within*, which both were truly visionary. Then recently, a continuation of this work was presented by UNESCO, titled *Rethinking Education* [18]. There are other interesting forays in this direction such as the foresighted and yet pragmatic work by the Canadian Alberta Teacher's Association [19, 20]. The association discusses how education must respond to the changes taking place in the world, by deliberating what new emphasis and material must be initiated, which practices and content should be continued and which should be discontinued; an unusual combination of foresight and pragmatism. They look into the future, by distinguishing between possible, probable and preferable futures [21] and then discuss what should be started new, continued or stopped, but again the curricular content issue is somewhat neglected. Even though a longer list could be drawn up of future oriented writings on education, we still claim that the discourse on how future scenarios might map onto education is relatively neglected. But here we will focus on the inertia to change, which will be the topic for the remainder of the paper. In what follows, we will list a number of reasons why it is difficult to bring about change, in particular as it relates to the ingredients of education, partly its aims, but primarily its content.

The inertia within education: what are the inertial constraints?

We now turn to the complex but intriguing plethora of interacting factors that hold back change in education, for good or bad reasons, with the eye on curricular change. There are substantial, even enormous differences between cultures and systems, but we still claim that the general features mentioned are generic and thus apply in important ways to a wide range of diverse contexts, where similar concerns are to be found globally in many different settings [22]. The literature referred to in the following demonstrates also how generic the features are that are being discussed.

General conservatism in the discourse on education

The discourse on education generally may be more conservative than we normally appreciate, both within and outside the system. However, this is difficult to substantiate, both for lack of empirical data and for conceptual reasons – it is difficult to determine what a conservative discourse is. It is difficult to go against the public sentiment and if it does not want changes, they will only happen very gradually in a democratic setting. Thus tradition, indiscriminate respect for old values and good performance using longstanding normative criteria, may hold change at bay within education, especially when it depends on public (parental) support. Here we are referring to the literal meaning of the term conservative. We take conservatism to refer to explicit or implicit, cultural, social and often systemic factors, such as the curriculum, that happen to be dominant or held in high esteem in a given society, and which are generally taken for granted with an appeal to tradition or habit.

Educational systems evolve at a notoriously slow pace and this applies to their form, operation and content; perhaps most to this last part.[5] A very important reason why education does not change is simply that there is little catalyst for change. Labaree [23, see esp. ch. 5] argues that educational reforms have always had problems getting past the classroom door, which may be a sensible buffer for the system. Nevertheless, we argue that curricular change should perhaps be the most important part of necessary educational development, without forgetting the principal aims of education as e.g., argued by Nussbaum [24], emphasising democracy, but also Biesta [25] who presents an inspiring and modern *raison d'être* for education, or Reiss and White [26], also with a timely call for an aims-based discussion of education.

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[3] These are Denmark, Finland, Iceland, Norway and Sweden.
[4] Chile, China, India, Mexico, Singapore, and the United States.

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[5] There is a massive critical literature on reforms of educational systems, i.e. their form, which are much in accordance with neo-liberal ideology, with emphasis on privatisation, testing, and massive accountability procedures. There is little evidence that these efforts bring education forward, nor are they future oriented.

Traditions, traditional values and often very strong interests keep education within the confines of old times (some even see this as the role of education). The traditions are strong and rigorous and so are the conservative constraints, which can be found at every level of society. They relate to old or traditional values, old content and old ways of doing things, and not least, entrenched interests. Of course, some old values should be cherished, because they are fundamental to educational enterprise, but which? And conversely, which traditional subject matters should be done away with? In his discussion of the fate of the "new math" in the US with emphasis on set theory and learning by discovery, Phillips [27] notes that "parents and teachers called for a return to the traditional practices of memorized facts and rote calculations" p. 143.

Here the reference is to the views of many parents and politicians and a somewhat conservative impetus from industry that the education system should mainly serve the current economy, rather than the potential economy of the coming decades. Thus industry itself may be unduly conservative, despite the impetus to compete and innovate (see e.g. discusssion from the UK [28]). Moreover, the part of the European 2020[6] growth effort, which focused on education saw it primarily as a tool to strengthen the labour market by reducing dropout and increasing the level of tertiary education.

It is interesting to consider to which extent the universities act as progressive or innovative catalysts on the educational levels below the tertiary stage, with their entrance requirements sometimes based on standardised high stake tests. It is, indeed, worth speculating to what extent the university, as an institution, can call itself foresighted, creative and progressive with regard to the education of young people while it also, directly or indirectly, tries to influence the curriculum of the previous levels without a clear future oriented curricular agenda. This directs the attention towards the curriculum at the universities and the trickling down effect into the school levels below; a part of education that one would like to see as being characterised by foresight from the presumed dynamic changes taking place at these top echelons of the educational system. A report commissioned by the Board on Physics and Astronomy of the National Research Council (U.S.) Committee on Undergraduate Physics Education Research and Implementation [29] states that impediments to change include "traditional academic cultures" and that the "subject matter and skills that undergraduates study [in physics] have remained largely static for more than 50 years. Students learn little about current discoveries and research, which they might find exciting or relevant to their lives" [29, p. 2]. These are very strong statements, from a country that has been considered to be at the forefront in the physical sciences, and a serious hint that rapid changes in content, method and technology struggle to find their way into our school systems, and perhaps some of the blame lies with higher education.

The academic discourse may indeed be conservative. Academia is normally considered to be at the cutting edge, to be the avant-garde, to be at least one, if not two steps ahead. Is it? Uzzi and Mukherjee [30] suggest that high impact research work travels the trodden path, but nevertheless carries an innovative element, as "the highest-impact science is primarily grounded in exceptionally conventional combinations of prior work yet simultaneously features an intrusion of unusual combinations" [30, p. 468]. Thus, there is a hint that academia may not always be as dynamic, inventive or creative as we want to believe it is, even when we are referring to the ballpark of cutting edge research. Thus it is possible to assume that the environment that surrounds primary and secondary education might consist of more inertial characteristics than we normally expect.

Education is an institution in more than one sense

Institutions change slowly. The educational edifice is an institution at more than one level. It is an intricate system, which has developed to become stable. Perhaps, no social institution equals the system of education in terms of its strong and rich legacy, reinforced by laws, regulations, culture and traditions; a system that also rests on a number of principles, most notably those of equality of access and basic education for all. Monolithic rules have gradually taken over as the system develops, reflected in institutional and academic drift, where an institution of schooling has a tendency to slowly extend itself, even into the arenas of pre-school and kindergarten, and also into non-formal education as tertiary education expands. Play in kindergarten, very gradually, gives way to school type practices and content. At higher levels, the curriculum in vocational and professional schools may also gradually become more academic [31]. And there may be incremental transfer of vocational training from industry into the school system. Some, but not all of these developments have an ideological basis and Rizvi and Lingard [32] suggest that "neoliberalism has underpinned the education policy shifts around the world" [32, p. 184] with characteristics, which Sahlberg [10] calls GERM (see next section) and the testing and evaluation mechanisms are becoming institutions in their own right [33]. The school system is also an effective gatekeeper, most often using substantive entrance criteria between levels, which are then carried into the labour market. It thus has a formidable credential power, which exerts an overwhelming control. The different educational levels interact and thus it may be impossible for one level in the system to make changes, particularly in the curriculum, if the level above is not ready to accept this or

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[6] One of the five targets to enhance growth of jobs and strengthening the economy was education, but had little to do directly with its content http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/index_en.htm

accommodate these in some way, and thus there is a form of institutional top-down control within the system. The ingredients of such systems are therefore not easily changed.

The schools themselves are also institutions, in addition to being organizations, as they are impregnated with structural ideas, norms and values. There is an important distinction to be made between schools as organizations that can be moulded by administrative changes or leadership, and schools when they exhibit the characteristics of institutions (see e.g., [34]) where norms and values are in control. Waks [7] argues that"fundamental educational change is not primarily about organizations [... but] is primarily about change in educational ideas, norms, organizational arrangements, and frameworks that constitute education as a social institution" (p. 294). Thus it becomes important to gauge to what extent the various features of the educational edifice should be regarded as an institution.

Making the situation particularly complex, the curriculum is itself is an institutional structure within the educational edifice, in the sense that its framework has evolved over a long time and which has a fairly robust structure with strong cultural underpinnings; it is intertwined with that of the school system and the schools as well as with national cultures. Reid [35] discusses the various ways in which the curriculum can be seen as an institution, being "a socially embedded idea", thus dependent on the culture in which it is situated, i.e., "the community that holds and supports it" [35, p. 8]. This implies that the changes to it are necessarily slow and efforts of change face significant difficulties, unless they are marginal modifications or additions. There are of course variations, but the fundamental structure is not easy to tamper with. White [4] demonstrates this with a historical analysis of the recurring content features of the English curriculum, in terms of the school subjects, demonstrating their permanence.

Thus, if education is recognised as an institution, the institutional analysis of education consequently becomes of utmost importance when attempting to understand the constraints on educational change. Meyer and Rowan [36] note that the theoretical framework contributed by the *New Institutionalism* in education suggests "that the key constraint for educational institutions […] is the need to maintain the trust and confidence of the public at large – in short, to maintain legitimacy by conforming to institutionalized norms, values, and technical lore" p. 5. It is therefore very serious when Borman and John [33] suggest that the gradual development of measurement and evaluation regimes in educational systems is in a sense institutionalizing mistrust. The more different sections of a system become institutionalised the more difficult they are to change.

Standards are difficult to challenge and change

Standards and accountability are conservative when it comes to the processes and content of education. Educational curricula around the world are driven by a set of standards, national or international. Setting standards is a clear sign of ambition. The problems with standards, however, especially those with high stakes, is that they are inherently conservative. They build on tested ideas and are consistently being more finely tuned, probably the more so, the higher the stakes. Standards are normally proposed and defended by those (especially institutions) with a relatively secure position, and those, which have also successfully met the criteria used. The standards must also be taken to be well intentioned and ambitious; they are enforced to ensure high quality work in the system. Nevertheless, they practically ensure that new things, new materials, new content will only have a very marginal space within the curriculum.[7] Noting this pernicious (and conservative) aspect is not meant to criticize the genuine ambition to shape high quality curricula. The situation may, however, be more serious. As noted above, Borman and John [33] argue that governments, in an effort to enhance trust in their educational systems, shift an operational focus "to instruments of checks and control" p. 6, i.e. to various testing and evaluation mechanisms. This is particularly interesting as it suggests that gradually developing mistrust is understood to be largely due to a lack of information by the population, which then has to be remedied, rather than due to stagnation within the system. It is thus simultaneously a question of both the driving forces and the consequences, which can be complex and perhaps also unintended as argued by Zhao [37], see especially chapters 6–8. Ravitch [13], in her condemnation of the current discourse on tests, suggests that the strong alliance of testing and privatisation controls the current political features of the educational system and there is no question that much of the current debate is in the throes of a PISA race, which emphasises certain literacies. In that connection, Sahlberg [38] has suggested that much of the public and political debate falls under a framework he calls the *Global Education Reform Movement* (GERM). This framework has six key ingredients, which may exert overwhelming control on the way education develops and consequently any decision regarding the shaping of educational content. These are, according to Sahlberg, the emphasis on standardized teaching and learning (to the

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[7] An example of this as a potential problem is noted in a recent study where "80 % of teachers interviewed by the Jubilee Centre stated that the British assessment system 'hinders the development of the whole child'. In other words, the current system can hold back the development of a child's moral character. The majority claimed that exams have become so pervasive in schools that they have crowded out other educational goods."[63].

detriment of innovative exploration of such practices), focus on literacy and numeracy (to the detriment of other subjects, such as art, music and sports), the tendency to teach for predetermined results (to the detriment of a wide range of novel areas), the inclination to borrow reform ideas (to the detriment of dynamic authentic experimentation), the demand for test-based accountability (with enormous effort spent on testing and preparation). And all of this results in substantial external control - building up enormous bureaucratic control to the detriment of dynamic professionalism.[8] At least four of the components listed above are top-down control factors. There can also be found an emphasis on placing trust in the education market as well as an underlying message that the quality of modern education is determined by PISA scores based on certain globally accepted skills, in particular literacy and numeracy. All of these aspects taken together present an incredibly narrow basis on which to judge the whole modern educational edifice which stifles innovative grass-root efforts, with conomitant signs of globalised educational governance [39]. Standards and the accompanying mechanisms of implementation are perhaps - and probably contrary to their intended effects - among the strongest conservative straight-jacket vis-à-vis the curriculum.

Are traditional ideas (subjects) still good?

Traditional disciplines were valuable. In his exploration of the history of the English curriculum, White [4] notes that "governments have insisted that the existing structure of academic subjects is not to be tampered with. Rather than seizing the opportunity to rethink school education as a genuinely aims-based enterprise, they have clung to the centuries-old pattern" p. 139. This may imply that the structure of the curriculum is difficult to change. The current ideas, their underlying rationale, their apparent sensibility or utility and the ambition behind their introduction were all convincing and credible some time ago, even though it took considerable time for them to win their place. Of course it is still valuable to learn mathematics, grammar, spelling, physics, chemistry, natural history, and perhaps also Latin, or Greek and the classical texts or learn some of the modern European languages that have been the ingredients of many curricula. The question is if it is more valuable than something else? For the curricular debate, the problem arises when an attempt is made to determine the power or value of individual subjects or their detailed content only in absolute, rather than relative terms. An excellent example of this is the debate presented by different authors in Bramall and White [40] on the pros and cons of mathematics as a compulsory subject in secondary education. The

disagreement is not about whether individual subjects can be shown to have inherent absolute value, but rather if they can be shown to be more valuable than one or several alternative subjects that have recently emerged. Here we mention in particular genetics, artificial intelligence and sustainability,[9] or ancient subjects in new guises such as communication and ethics.[10] All these could stand the test of being proper scientific disciplines that might also contend for the core of modern general education perhaps hand in hand with cultural, anthropological and economic studies.[11] It is even possible that outdoor studies[12] might be brought into the centre and perhaps it is sensible to move nature thus into the heart of educational curricula (see e.g., [41, 42]). The subjects mentioned here are not intended as a judgment of what should be the ingredients of general education, but the point is rather to underline that the discussion of what education is, i.e., on what basis we select the content, needs to be on-going.

The emphasis on the time-honoured form of the curriculum may probably be traced to older generations in the educational debate and to a long-standing tradition, but it may also be influenced by the judgement of those outstanding young people who did so well with the traditional curriculum. On the basis of their continuing success, within the traditional academic or vocational environment, where they often play a leading role, there is a chance that they will attribute some causal relationship between the curriculum and their own success and therefore become champions of the traditional content and its generic value. The intrinsic strength of traditional subjects shows very clearly the dilemma for the innovative discourse. It is not a question of whether the old ideas are good; it is a question of whether there are new ideas that may be potentially better, more powerful, even if they have not been fully developed. It is thus the comparative problem that we have to deal with, not the absolute question.

There are two explicit lines of argument that make changes in and from the traditional subjects particularly difficult. They revolve around what students "need" to learn and the "necessary content basics". The first refers to a very serious confusion when the term "need" is used as a synonym for

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[8] This underscores a complication in my argument, because as it develops it transpires that there is considerable inertia within the professional body which, however, does show examples of initiative to change.

[9] During the decade for sustainable development http://en.unesco.org/themes/education-sustainable-development 2005–2014, UNESCO developed a coherent curriculum that could well contend for being a major component of any national curriculum http://www.unesco.org/education/tlsf/. This would include much material already taught but in a different and well-developed context.
[10] These subjects are examples, their content and extent need much clarification and argumentation to be taken as serious contenders for being focal topics. That is a different paper.
[11] Again, we are not entering the centuries old debate about competencies, arts or science, simply noting substantive areas that should now be entered into the debate as serious contenders.
[12] Noting a field that is suggested, partly as a response to massive urbanization and essentially preventing people from knowing nature.

useful or relevant. People often ask if there is a need to learn mathematics, languages, science or whatever subject that comes to mind, when they are in fact asking if it would be useful, or helpful to have some mastery of them. There are very few subjects or skills that are not valuable to know or master but very few that one individual – or even a large group – needs, i.e., would not survive or even thrive without being in command of. Yet another component of the traditional subject legacy is the idea of the content basics, in particular the fundamental principles (of mathematics, physics, biology, geography, etc.) that must be mastered before continuing onto more advanced subject content. There are probably very few who would question that some basics must be in place, not only literacy and arithmetic, but also the basics in the natural and even social sciences, in particular history, and of course the grammar of languages. But this must also be critically examined and they may be wrong. Fox [43] forcefully argues that the sensible option might often be to skip the basics of a subject and jump right to the frontiers of powerful (solid) knowledge and thus bring the young students to the exciting edges of knowledge in the making. But it is not only a pedagogical or an organizational issue he is addressing - and questioning, but the institution of the curriculum, with its legacy of norms and values.

A very important defence of the subject based curriculum is presented by Young [44] who argues that well developed disciplinary knowledge should be a point of departure for education, rather than the student or the context (e.g. problems facing the world). Thus he argues that powerful knowledge should not be defended on instrumental grounds, i.e., on its efficacy in solving social problems [45]. Instead, powerful knowledge should serve "the intellectual development of students" p. 24. The question remains; what subjects and their related conceptual ingredients would best aid this development? The line taken here is that various new subjects or those with very modern ingredients, such as those mentioned above, which all have very clear and profound technical, ethical and social dimensions, would best serve this purpose as these would help the young to connect to the world and apprehend and understand the challenges they face in the present and future world.[13] It should be noted that even though the scientific nature of these areas are most noteworthy (e.g., genetics, computer and cognitive science, communication science) it would probably be their ethical and social dimensions that would be of greatest importance in a revised general curriculum.

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[13] Genetics presents perhaps the clearest example of field that is developing very fast, probably at accelerating pace and is already presenting challenges on all fronts. There are all kinds of biological and technical issues, that form a wide scientific discipline base but no less important are clear ethical and social concerns that will become a topic of a very general debate in the next decades, not only among the technical experts. This is clearly an ingredient for general education.

New ideas are fuzzy and complex, but they may be eminently sensible

New ideas, new content, may be fuzzy and it may be difficult to demonstrate that they provide a better education given the aims setting the course and their applicability with regard to shaping educational content. New ideas that are meant to replace the old ones are sometimes woolly or cloudy, not well moulded and sometimes even vacuous – or even non-existent.[14] This may especially hold when it comes to issues of competency, where the various competencies may inherently be very difficult to teach and test. This was the case with a number of "new" ideas that were proposed during the 20th century, classified as belonging to progressive education and constructivism, e.g. related to discovery or project learning, ideas meant to foster scientific exploration, social awareness, creativity, arts or moral values. This also applies to some of the 21st century skills programmes which have been repeatedly proposed for the last 20–30 years, not only for preparing for a new labour market, but also for personal development and will undoubtedly also apply to the new basic factors in the new EC eight key competencies [14].

The new ideas may not always have the evidential backing that they would benefit from, but which is difficult to provide. To the extent that the curriculum is meant to prepare for a distant future, the real test can only be done many decades into the future. Even if new ideas have a solid conceptual base, are well prepared and carried out in a seemingly competent manner, there may still be lingering problems. In this context, Lingard and McGregor [46] describe the implementation of a new curriculum in Queensland Australia, dubbed the "New Basics", and which they judged to be particularly well conceptualized and skilfully implemented. The new curriculum had an ambitious combination of generic skills, new material and new pedagogic approaches. Nevertheless, in the context of testing and accountability, and under the influence of an Australian national curriculum, they conclude that "the New Basics have passed into the dustbin of Queensland educational history" p. 225. A part of the general problem may be that so-called "generic skills" or competencies are difficult to define and measure and thus to handle in concrete terms. Neither may they be as generic or transferable as often expected or wished. The issue of transfer is a huge problem for education, which seems to be neglected in much of the current discussion on the curriculum, even though it has been visible before [47]. The potential dissociation of process and content is pedagogically a serious problem, as also argued by McPeck [48] in the

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[14] This last point is certainly Dewey's complaint, lamenting that there "is always the danger in a new movement that in rejecting the aims and methods of that which it would supplant, it may develop its principles negatively rather than positively and constructively"[64].

case of critical thinking and noted by Young, Lambert [6] in the more general case of generic skills.[15]

Vested interests have a firm grip

Vested interests have a huge influence in all walks of life. Understandably, interests are attached to the ideas or visions that the subject experts have learned to value and want to promote. Many experts are culturally and intellectually attached to their subjects, to their fields, and therefore find even the idea of the subjects' demise within the system totally sacrilegious. And the jobs people have may also be at stake. If the content of the curriculum is changed, perhaps beyond the existing competence of the current experts, and old material is replaced with new, or if current subjects are discontinued, job security might be at a serious risk. Thus, many people will understandably resist any change that has to do with them gradually giving up their subject, possibly having to completely renew themselves (even though many do) or lose their jobs. The fact that one may seriously threaten a variety of vested interests and ideals of those who are already lodged in the system, presents a vast challenge for those who argue for replacing the old with the new. This may operate at several levels and therefore perhaps presents the most formidable obstacles of all the ones mentioned here. It has so much to do with people's livelihood. Thus, investigating previous examples of proposed new curricula which contain new insights, topics or competencies, it would be necessary to explore if these new aspects are basically added onto the content that is already there; if they became marginal add-ons? However, vested interests do not only affect the curriculum in isolation, but also education in schools more generally. Tyack and Cuban [1] note two principles of change that school reformers should know about. One is "how schools change reforms", i.e., how schools adapt new ideas to the current practices and thereby often transform these new ideas in the process. The other is understanding "the grammar of schooling", which means that new ideas or practices must be manageable within the system as it is operated. Goodson [49] rather pessimistically, but hopefully overstating the case writing on curriculum change, brings a different perspective, which points the same way, when he notes that the "personal and professional commitment that must exist at the heart of any new changes and reforms is absent [as] […] there is a mixture of profound indifference and active hostility to so many changes and reforms" p. 220.

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[15] This is one of the neglected subjects in the modern educational discourse. A fundamental assumption of much of the educational curriculum, is that what is learned in school can be used outside school; also what is learned in one context or one subject, e.g., problem solving, critical thinking, logical thinking can be used independent of situation in which it was mastered. This is most important when the emphasis is on a variety of new skills that are often assumed to be generic, or content independent, but are probably not.

The vested interests have thus influenced or rather controlled the educational discourse, in a number of ways. First, by controlling who can talk about what. It may often be inappropriate for non-subject specialists to discuss the content of a subject curriculum. Who would be eligible to discuss the mathematics or history curriculum within the professional environment of a school, aside from the subject specialists? The other specialists, e.g. the school leadership, might be eligible to talk about assessment procedures or didactics and of interdisciplinary exploration, but not the intricate content of the subject curriculum. Second, the discussion about content is most of the time defined by the existing subjects. Defending an existing subject will be done in absolute terms, as noted above, i.e. in terms of whether mathematics or arithmetic or numeracy are important or useful (which of course they are), rather than bringing them into the comparative domain, where they might not do as well.

Teacher education may stifle change

Modern education of teachers may supress rather than encourage developments of content in education. Even assuming that those responsible for teacher education are truly up to-date and that they follow the development of modern ideas, as well as tackling relevant new challenges in education, we still suggest that teacher education is conservative, in at least two ways. The first relates to the subject based segmentation that characterizes many teacher education programmes. Traditional subjects, and what their proponents decide to introduce, determine what teachers are prepared for. Thus, new subjects or issues or emphases do not gain ground within the programmes of teacher education unless there is space for them among the existing subjects. The examples might be the capacity to teach computer programming, the nature of sustainability challenges or the introduction of ethics as a serious challenge for many areas of modern society, or bringing new technology or multicultural issues to the fore. This is just to name a few important arenas of knowledge that new teachers will go without unless some space is opened up for these subjects within their TE program. If university biology teachers do not emphasise genetics as a potential part of general education or the mathematicians or psychologist do not introduce artificial intelligence at the university level for prospective teachers, there is a danger that these crucial topics will not be tackled in a serious way by many of the subject specialists preparing as teachers. For a long time, neither anthropology nor economics were a serious part of teacher education and thus not serious contenders as a part of general education. Interdisciplinary projects may also struggle to find their place within the university system since their implementation will largely depend on the extent to which the subject departments related to teacher education foster interdisciplinarity. Whatever views modern educators have on what counts

as important subjects or skills for general education, the possibility for in-depth action by teachers is largely defined by subject departments that are often solely focussed on the development of their particular discipline. It is also possible that teacher education (pedagogy etc.) may become increasingly dissociated from the disciplines and the academic subjects from teaching [50] due to the academic drift of teacher education within the university level hierarchy, where it becomes entrenched at the Bologna stages [51].

Secondly, professional development, which is indeed a crucial part of teacher education, is rather chaotic and unsystematic in many educational systems. This literally holds back the development of education. There can be no doubt that it is totally insufficient that teacher education solely comprises initial training and then some sporadic updating. Given the rapid developments of knowledge, skills and the social and technological environment, the professional development of teachers becomes crucial for their continued professional competence. However, the professional development of teachers, following their formal teacher training program, is often not formally within the purview of universities, except on an ad hoc basis, and it is rarely formalised on par with the initial stages. This can have its pros and cons but the weakness lies in the lack of formalised effort to foster ongoing professional development including perspectives toward possible futures. Sustained and effective development of new knowledge and competencies within the teaching profession needs an effective system, anchored also within the schools and their practices. It should also have strong ties with the professional enterprises, the universities, in accumulating frontier knowledge, not only in pedagogy but all the various developing spheres of modern knowledge.

Lack of motivation and little space for initiatives oriented towards possible futures

There is a lack of incentive or space to take the initiative. Educational leaders (within schools, not only principals) who could in principle take an initiative for future oriented school development are preoccupied with other things than probing research and future scenarios. Exploring research and following a wide spectrum of modern development is certainly time-consuming if these were to have some priority, both from the leadership and the teachers. Neither may be available [52].[16]

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[16] In the OECD TALIS report on the teaching job with focus on professional development, Table 3.10 shows that on average about 25 % of the principals' time was used for curriculum related tasks, "including developing curriculum, teaching, classroom observations, student evaluation, mentoring teachers, teacher professional development". Following a general future orientated discourse and research within the field of education would demand considerable additional time. As for teachers, Table 6.12 shows that on average, half of the teachers' time among the countries investigated, is used for teaching. Furthermore, only 9 % (knowledge of subject fields) and 8 % (curriculum) of teachers claim that they would prioritise these areas for professional development.

Changes and challenges within the system of education require immense energy, vision and understanding. Engaging constantly with new ideas, new thinking about education and dealing with the various inertias of change, when taken together, presents a formidable task even if the desire for change is present. The demands and pressure on the school system are steadily increasing, and consequently, the tasks for the leaders at all levels, multiply. They cannot, despite their potential interest, take time to immerse themselves in the ideas and development required by the complex task of attending to possible futures. It is not clear whether either Hargreaves and Shirley [53], who argue for the initiative of teachers, nor Young and Lambert [6], who imply the important active role of the subject specialists, have really dealt with this problem of ensuring that the teachers have the leeway, the time, the foresight and competence to introduce new ideas, when they quite rightly emphasise the trust that must be placed in the professional teacher and the school leadership for developing education.

One reason why new ideas do not emerge sufficiently within the sphere of education is that very few people who are engaged in education have the wide-ranging overview or perspective over all the different but pressing reasons for curricular change. Neither do they normally have the informed foresight necessary (only obtained by constant vigilance, following what is happening in many different fields) to motivate sensible developments. Crudely speaking, it is a problem of ignorance, which in a crucial sense is a concomitant of the expansion of knowledge [33]. Apart within some Think-Tanks or specialised future-oriented organisations, very few individuals have the opportunity or the responsibility to follow the multifaceted and substantial changes in the social, ethical, technological and cultural environment, and the possible educational implications. Hardly any government agencies and certainly not municipalities, schools or teachers engage in this. The field of education is also very fragmented in terms of professional expertise and mission, which is a serious problem for education in general and future orientation in particular.

There are clearinghouses,[17] which deal mainly with existing evidence and are thus only marginally future oriented even though the evidence collected is meant to inform policy. Moreover, there are Think Tanks which also collect evidence but with a clear policy agenda, but rarely with focus on education. There are also future institutes,[18] which are set up precisely to ensure that knowledge about possible futures is assembled. But such future institutes rarely focus on education

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[17] Clearinghouses are institutions that collect evidence and research on certain topics and present a synopsis. An example is the Danish Clearinghouse for Educational Research which "provides an overview of the best currently available knowledge regarding good evidence-informed educational practice".

[18] See the following lists http://www.wfsf.org/ and those engaged in education, at least partly, are http://www.wfs.org/ in the US and http://www.futures.hawaii.edu/ in Hawaii.

and neither would they create steps for channelling emerging ideas into practice. Educational experts such as Murgatroyd [54] and Aviram [55] have attended to this issue in a direct, extensive and provocative way, but their ideas still need to find a way into the mainstream curricular debate. An additional problem here is that when a future perspective is at least nominally adopted, it tends to be very narrow, directed towards the labour market, the world of work, whereas scientific, social, ethical and cultural issues are somewhat neglected, but are probably more important.

No consequence if no change takes place

Nothing happens, even if we do not change much? Nothing dramatic happens if we do not exchange new ideas for old ones. In fact, it is of no consequence — yet. The claim is made on the basis of two related reasons. One is that the main impact of much of education is meant to be seen many years after it takes place (even though we normally test immediately within education). The other is that no system would have any sort of comparison with other systems until possibly decades later. Therefore, it is unnecessarily onerous to take on the fight for new ideas, replacing old well-established and tested ones. And lamentably few would complain if nothing is done. Thus, perhaps lethargy or indifference could be counted as an inertial mould. This *laissez-faire* stance presents, nevertheless, at least three problems. First, young people are not given the opportunity to engage in the variety of interesting and valuable challenges that new ideas, new skills, new technologies or new cultures might afford them. They – and indeed all of us – are cheated, perhaps in a serious way. Of course, they will nevertheless survive; many of them will of course do very well, regardless, and indeed make much of the education they received. Second, many young people may be seriously demotivated if they feel that their education is not addressing the important issues or content that they think will become important and would stimulate them. Thirdly, many of the grand challenges of modernity and possible futures scenarios facing the world demand necessarily pre-emptive and pro-active action, which these young people are expected to grapple with at a later date. There is certain danger that inaction will weaken the preparation for these challenges and thus the potential response will be much feebler. In brief, the power to engender positive change will remain unharnessed. This also relates to the previous points of vested interests. There are so few, if any, that have a vested interest in the renewal of the curriculum and thus there are no agents or stakeholders in sight to take up the issue. This is a problem because it is possible to offer a very strong substantive argument for quite dramatic changes to the foundation of the curriculum, argued on the basis of changes already visible, but more importantly on the basis of changes that will occur in the next three or four decades which may lead to various future scenarios.

Discussion

This paper presumes the importance of bringing possible futures into the discussion about the content of education, but little will happen if we do not acquire a firm understanding of the obstacles to change or the inactive roles played by presumed facilitators. The institutional features, traditions and vested interests resisting any but incremental change in the content of education are immense. But we should of course be reminded that not all changes are sensible and many of the examples of inertia may be well founded. It should also be stressed that future scenarios, which are sorely lacking in the discussion about education should not entirely dominate the educational discourse. Education is also about the present and how we connect to the past; it is also about the person and her relationship to society. The most important educational issue is the discourse about its aims and how they guide us to attend to the past, to the present, and importantly, to the near and far potential futures.

Is there a problem?

From a certain perspective there is no problem with our educational curriculum, despite what has been said, and there never will be, even if some people complain. This is because we will always adapt to the current situation and we would never know what it might have been like if we had done things differently. That is why those who detract from change will always be equally right as those who seek change. What is being argued above, nevertheless, is that we would most likely have more enlightened, dynamic and democratic societies and be able to address many of our current and future challenges much better if we *developed the content of our education*, partly with old and partly with new ideas, and particularly with new content. The more farsighted and powerful the knowledge our education offers, the more likely we are to develop a good society. There is, however, no easy path in this direction.

The logistics of change within education

The logistic problem of harnessing the constant flux of new knowledge in the system of education is enormous. The number of actors is daunting and thus the purely logistic problem of implementing change is huge. In 2015, the global school age cohort is not far from 125 million children [56, see Table A.31]. If we imagine that all children could go to school in a class of 25 pupils, this would require five million teachers per cohort or 50 million teachers for 10 cohorts in basic education. Introducing new ideas on a regular basis is therefore a daunting task; even for those ideas that are well received. If they are meant to become a part of a genuinely educational

process, we must thoroughly involve the teachers themselves in assimilating and impregnating the flow of ideas with an educational value. That is a major problem and if this is not addressed, the teachers will never have a real opportunity to become actively involved to the minimum extent necessary. The logistics of channelling new ideas into a potentially beneficial practice has been tried in many ways, but most of them have been far too limited. In addition to teacher education, which only covers the initial phase of a long practice there are of course meetings, consultations, conferences and journals. The ideas of clearinghouses and Think Tanks have been tried.[19] Knowledge mobilization may be an important avenue, and Campbell[20] notes that a "key lesson has been that 'doing' knowledge mobilization and building partnerships do not happen automatically or easily; considerable attention to building capacity and skills are required. I would like to see more dedicated funding for the mobilization and use of research in education and linked capacity building for researchers and educators" [57]. Thus, the second problem, of forging the connection between research, evidence and practice, is a difficult one. Miettinen [58] argues, both by reference to theory and examples that different types of networks among teachers and schools is the most promising approach to sustained change. Brown [59] similarly suggests that change efforts "could occur most effectively via the establishment of policy learning communities and processes to facilitate the creation of knowledge within them". Nevertheless, even if such channels could be opened or operational modes established, it still lacks a conclusive or normative pointer; a research paper or a collection of massive evidence may indicate various problems or faults in current practice or note which of various avenues is the most desirable, if one had to choose from among those evaluated. Still, it does not specify which path, out of all imaginable ones, is the right, best or even a good one to take.

The agents of change – a dilemma

Who should then become the agents or facilitators of changes or development that relate to educational content? There are of course optimists who assume it is possible to bring about changes, at least of the curriculum. There seem to be at least two very different views on how this might be done and there

might also be a third. (The idea that the market should be in command within education is rarely proposed on the basis of dynamism, but based on social efficiency, which may have little to do with change).

One optimistic view, which is however only implicit in the current discussion, is that successful curricular development might be a top-down process, involving local authorities, national governments or even international organisations, such as the OECD. This can be seen in the implicit drive towards national curricula, sometimes accompanied by national testing programmes, which are used in order to ensure equity and standards. It is also implicit in the PISA international initiative, even though it was probably never the intention to enforce a global curriculum. Nevertheless, it has had such an effect, at least to the extent that most nations which participate want to score well on PISA tests and thus make sure their curricula live up to the test. In both settings, the standards set and the drive to both reach and surpass them would be the principal fuel for improvement.

The other view is that changes must and can be driven by the schools themselves, including the school leadership and the teachers [60],[21] even though it is not quite clear if this is meant to include curricular development, directed specifically to potential future scenarios. "Treat them with respect, let them learn from their peers and give them the freedom to make decisions as a team", Hargreaves and Fullan note when they received acknowledgement for their work [61].[22] This goes well with the general idea that ownership of ideas is a precondition for their successful implementation. Thus, perhaps the most sensible way forward is to relax both the institutional and centralised grip on the curriculum and entrust the professional teachers, literally, with the task of educating the young generations. This would mean placing trust in the disciplinary and eduational professionalism of the teachers, and thus countering the developments of mistrust as clarified by Borman and John [33], and sensibly taking up Fox's [43] ideas of EdGe-ucation. Thus a population would essentially produce its educationally based competence by crowdsourcing, not only at post-compulsory level, but both earlier – and later. Goodson [49] rather optimistically believes "that we shall, once again, see "bottom-up" change, internal to the school, generating new agendas of change" p. 220. But it is unlikely to happen unless it is engineered and encouraged by all the major stakeholders in the process.

However, we suggest there is a problem with both these classes of ideas. Their implementation may suffer due to a general lack of communication between the major stakeholders and agents, which connect to education and even

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[19] In medicine, there are "translational science" centres and the triple or n-tuple helix structures have been used in attempt to form good channels of efficient communication between various stakeholders for advancing big projects. From Activity theory we have the Change Laboratories which are mechanisms of change being developed within various fields. Thus there are tools being developed.

[20] Carol Campbell, current (2016) Co-Director of the Knowledge Network for Applied Education Research (KNAER) at the University of Toronto.

[21] Here a different reference group is used, i.e., teachers at all levels, compared to a narrower definition above, the time lapse is 20 years.

[22] See http://www.prnewswire.com/news-releases/hargreaves-fullan-win-grawemeyer-education-award-284696381.html

between different levels and operators (e.g., governments and assessment systems) within education. There is a host of reasons why governments cannot create a dynamic education system without close consultation with the teachers. Which is especially difficult, if they are simultaneously developing a mammoth system of measurements, largely based on a mistrust of the system [33], i.e., this professional group of teachers. On the other hand, it would probably be somewhat naive to expect teachers in individual schools or districts, without considerable support, to engender the dynamic development implicitly envisaged in this text. In order to do so, they must continuously renew their expertise through professional development, but also group together in a variety of ways.

This text is based on the belief that there are immense changes already taking place in our local and global worlds, which will continue, perhaps at an accelerating rate, which the systems of education need to understand and steadily take into account, literally, seriously and formally. There are ambitious attempts to renovate national curricula [2, 3] and at the level of individual schools as shown by a host of impressive examples by Robinson [62]. It must thus be acknowledged that schools and their agenda and their content and methods of teaching are changing, but too slowly. Perhaps most of the current interest is focussed on changing how schools are run, − perhaps the only aspect that does not need to change and there is no evidence that such modification will inspire the changes that are important.

Above, we have pointed out a number of reasons why change, particularly as it refers to the content of education, has a host of obstacles to contend with. None of them are intrinsically pernicious but they may hinder sensible change. As an example, it is certainly not claimed that institutional values, sensible assessment or the love of one's subject should be considered negative in themselves, but I have argued how these may nevertheless hinder sensible developments, most often inadvertently. Such inertia is thus quite serious, and if it is not faced and tackled, it will make a dynamic renovation of the ingredients of education very difficult. We have argued that the content of education does not figure sufficiently in the educational reform discussion – where it should be, but even if it is attended to it will have great difficulties accommodating the changes that should take place. Thus, all of these obstacles mentioned should be addressed head on in order to pave the way for the successful development of education.

Systems of education must discuss and understand their own *raison d'être* from a sophisticated philosophical and educational perspective, also taking thoroughly into account a future perspective, involving a spectrum of potential futures. Furthermore, as changes in content are certainly needed, a sophisticated understanding of the inertia within systems must be present and how it can be overcome, without, however, attempting to enforce narrow - minded political agendas in the guise of reforms. With reference to the educational reform literature we are here not really focusing on commonly discussed reform, e.g. on how schools are run, or inspected and children tested, but on a genuine and deliberated, visionary and sustained development of the curriculum.

The dilemma we bring up here is, however, not only about fundamental curricular issues and change but also about who would have the competence and drive to discuss and implement the sensible changes. To put it differently, what educational vision, overview and fundamental knowledge about education, possible futures and the mechanisms of institutional change is needed as a minimum to take up these issues? Furthermore, who should take the initiative and what is their agenda? Where is the arena for these discussions? The problem is that there are very few in sight that possess the characteristics mentioned above, and are equipped with the urge, status, authority, overview and the competence to do so. It is also worth asking: who would accept the responsibility – and not lose touch with those operating the system of education?

There is, however, an agency formally in place that has offered to take on this task, namely, UNESCO. Institutionally, it is the right agency for the undertaking. However, it needs to be empowered for the task, in formal, visible and practical terms. Not to decide on the curricular issues, these should not be determined on a global level, as has proven to be the unintended consequence of the OECD PISA exercise. Given the vision and depth of the previous UNESCO reports on education, the next step in UNESCO's endeavour should be very welcomed, see in particular UNESCO: Education Research and Foresight [18], *Rethinking Education*, which emphasises the changing nature of education, both with regard to form and content, but also its complexity when addressed within different cultures. Another promising agent is the Council of Europe, e.g., its Pestalozzi Programme, which perhaps does not quite have the legitimacy of UNESCO on the global scale, but has by its past endeavour, motivation and scope shown it might take the initiative. This needs to be done by a legitimate and a powerful actor.

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