Pragmatically Perfect Educational Framework

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Summary

This document provides an analytically derived approach to the provision of education to members of society, catering for the full range of pupils having different abilities, attitudes, home environments and levels of parental support. It addresses the deficiencies of the current system (for example one size does not fit all and the product output is not fit for society or work). The resultant affordable solution framework builds on established methodologies without any idealogical influences. The goals of the framework are that all pupils are able reach their potential throughout their life and contribute happily and positively to society. Asscoiated documents that should be read to complete the picture are The Pragmatically Perfect Framework for the Service Delivery and The pragmatically Perfect Framework Delivery of Skills Training.

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Introduction

This paper is intended to provide an analytically based approach to the education of humans of any race or culture rather than one which is ideologically based or distorted by current thinking. The paper was written because the author was unable to find any existing material which addressed all aspects of education in a neutral fashion.

Prior to presenting the framework, the real purpose of education is postulated and the assumptions derived of the range of genetic base and nurturing environment of the pupil intake.

The paper captures a number of alternative approaches and extracts the strengths of each approach based on published statistical evidence.

The postulated framework is flexible enough to benefit from technological advances and improved understanding of learning. The solution acknowledges that there is a minimum level of attainment that has to be reached in certain aspects of life for all citizens to be able to live happily in today's society. It also recognises that learning does not stop just because one leaves an educational establishment and so ongoing facilities need to be provided. The focus is on providing pupils with the tools to live in today's society and the motivation to achieve the best in whatever is appropriate to their intrinsic talents rather than a contrived exam certificate. The author does not claim to have all the answers, and would encourage all readers to provide feedback to enable the concepts to evolve in a positive manner.

Purpose of Education

There have been a number of statements regarding the purpose of education.

The ASCD Committee on Platform of Beliefs, Educational Leadership stated in January 1957 that "The main purpose of the American school is to provide for the fullest possible development of each learner for living morally, creatively, and productively in a democratic society." (http://www.ascd.org/ASCD/pdf/journals/ed_update/eu201207_infographic.pdf).

In the 1980s, the noted educator and philosopher Mortimore Adler put forth the Paideia Proposal (Adler, 1982) which integrated the ideas of Dewey and Counts, as well as his own. Specifically, Adler suggested that there are three objectives of children's schooling:

- the development of citizenship,
- personal growth or self-improvement, and
- occupational preparation.

David Tyack has argued that from an historical perspective, the purpose of schooling has been tied to social and economic needs (Tyack, 1988). More recently, some sociologists have argued that schools exist primarily to serve a practical credentialing function in society (Labaree, 1997). Expanding on the pragmatic purpose of school, deMarrais and LeCompte (1995) outlined four major purposes of schooling that include:

- intellectual purposes such as the development of mathematical and reading skills;
- political purposes such as the assimilation of immigrants;
- economic purposes such as job preparation; and
- social purposes such as the development of social and moral responsibility.

  (http://www.purposeofschool.com/philosophical/)

For the purposes of this paper, it is assumed that an educational framework for society needs to ensure that each and every pupil, on concluding the basic phase of education,

- is self aware and knows their strengths and weaknesses.
- is content with life, relationships with others and can manage set-backs within the context of society
- understands how to live a healthy life
- is able and willing to maximise their contribution to society
- is able to develop new skills throughout life to adapt to changing circumstances.

It is important to note the purpose of education is not to enable pupils to pass exams, but to prepare them for life in the fullest sense. Education differs from indoctrination in that it encourages pupils to make decisions for themselves rather conform unquestionably to set of decisions made by others such as parents, personalities or religious leaders. However there are some elements of education

that need to be learnt by rote (e.g Legible handwriting, time tables, use of language etc). In order to maintain consistency with the common understanding of education, this paper does not address the acquiring of job specific skills as this is addressed in a separate paper.

External Factors influencing pupils entering the Education System

Society provided education only occurs after a child has been subjected to other influences. The 'nurture' phase of education intrinsically relies on the inquisitive mind of a child and natural absorption of data entering the mind. Initially learning relies on the unquestioning respect a child has for its parents. Children, as they grow up, become more independent of their parents and thus should be able to independently validate the advice provided in their early years. A flexible society provided educational framework thus takes account of a child's nurtured learning phase, which means that children need to be assessed on entering the system. It needs to be recognised that society based education may provide a child with guidance which is in conflict with where some aspects of parental historical culture.
Of particular relevance in this area, is with regard to religion where parents may encourage their offspring to adopt the guidance of historical figures usually as interpreted by a specialist in the domain. Most religious 'education' however is indoctrination because pupils are expected to accept it unquestioningly since it is a 'belief' even where it is at variance with scientific evidence. As with parental supplied nurtured information, education should encourage pupils to question all material supplied and be able to reason through the differences in content between religious education with modern day understanding resulting from improved science and technology. Other areas of potential indoctrination include state media, social media, 'false news' and peer pressure, all of which the educated citizen must be able to question in a constructive manner. As such society provided education must include the moral framework by which society lives (as articulated in Pragmatically Perfect Society Framework).

Key to this paper is the understanding that an individual's education is the sum of input from the pupil's parents, the pupil's local environment, 'formal' schooling and ad hoc activities external to any formal schooling. Irrespective of what environment teaching is provided in, currently there is a common set of experiences that applies to all children from birth to adulthood.

1. Pre-society educational
    - that provided by parents (levels and suitability will be parent dependant).
    - environmental conditions and interaction with local children and offspring of parental friends.
2. Initial group education (e.g. pre-school, nursery or first days at primary)
3. Society provided 'academic' education.
4. Initial work experience and vocation training as appropriate (outside of the scope of this document).

Items 1- 3 above may be supplemented by clubs and societies which children may be introduced to outside of the society's framework.

Genes

It is a biological fact that with the exception of identical twins we are all born with different DNA and genes. These differences affect the rate at which we develop and our biological characteristics.

The following points emerge from Intelligence: Genetics, Genes, and Genomics by Robert Plomin and Frank M. Spinath of King's College London published in 2004, Journal of Personality and Social Psychology.

- Studies carried out in the 1990s have effectively established that individual differences in intelligence are substantially (50%) heritable. Later research now suggests that the heredity element in adulthood is higher, perhaps as high as 80%.
- Nearly all personality traits show that, contrary to theories of socialization from Freud onwards, environmental influences operate to make siblings growing up in the same family as different from one another as children growing up in different families (Harris, 1998; Plomin & Daniels, 1987). However, intelligence is the exception to this rule of non-shared environmental influence (Plomin, 1988).
- Because adoptive siblings are unrelated genetically, what makes them similar is shared rearing, suggesting that about a third of the total variance can be explained by shared environmental influences.
- Although shared environment is important for intelligence in childhood, recent studies of adoptive siblings assessed after adolescence show an average correlation of zero (McGue et al., 1993). These results indicate that although shared environment affects intelligence in childhood, in the long run environmental influences on intelligence are non-shared.
- DNA causes of severe mental retardation are not usually genetic as inherited siblings of these retarded children were not retarded.
- In contrast, siblings of mildly retarded children tend to have lower than average IQ scores

Wikipedia provides informative material about IQ, for the purposes of this paper the following two tables are of interest.

Accomplishment	IQ	Test/study	Year
MDs, JDs, and PhDs	125	WAIS-R	1987
College graduates	112	KAIT	2000
		K-BIT	1992
1–3 years of college	115	WAIS-R	
	104	KAIT	
		K-BIT	
Clerical and sales workers	105–110	WAIS-R	
	100–105		
High school graduates, skilled workers (e.g., electricians, cabinetmakers)	100	KAIT	
		WAIS-R	
	97	K-BIT	
1–3 years of high school (completed 9–11 years of school)	94	KAIT	
	90	K-BIT	
	95	WAIS-R	
Semi-skilled workers (e.g. truck drivers, factory workers)	90–95		
Elementary school graduates (completed eighth grade)	90		
Elementary school dropouts (completed 0–7 years of school)	80–85		
Have 50/50 chance of reaching high school	75		

Table 1 Average adult combined IQs associated with real-life accomplishments by various tests[131][132] .

Accomplishment	IQ	Test/study	Year
Professional and technical	112		
Managers and administrators	104		
Clerical workers, sales workers, skilled workers, craftsmen, and foremen	101		
Semi-skilled workers (operatives, service workers, including private household)	92		
Unskilled workers	87		
Adults can harvest vegetables, repair furniture	60		
Adults can do domestic work	50		

Table 2 Average IQ of various occupational groups:[133] /Type of work that can be accomplished: [131]

There is considerable variation within and overlap among these categories. People with high IQs are found at all levels of education and occupational categories. The biggest difference occurs for low IQs with only an occasional college graduate or professional scoring below 90.[22] For context readers should be aware that when current IQ tests were developed, the median raw score of the norming sample is defined as IQ 100 and scores each standard deviation (SD) up or down are defined as 15 IQ points greater or less,[3]. By this definition, approximately two-thirds of the population scores are between IQ 85 and IQ 115. About 2.5 percent of the population scores above 130, and 2.5 percent below 70.

The author contends that the adoption of a single measurement is not of help in informing the detail of the educational discussion. In 1994 an article in the Wall Street Journal signed by 52 researchers postulated that intelligence is a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings - "catching on," "making sense" of things, or "figuring out" what to do. A more useful concept is to work on the basis that each child has a maximum potential ability in each of the following areas:

- The ability to retain and recall information/knowledge
- The ability to understand information
- The ability to analyse situations (enquiring minds, proactive steps to get all information).
- The ability to apply knowledge and common sense
- The ability to visualise situations and output
- The physical coordination of the body (e.g. hand/eye – not normally within the scope of intelligence).
- The ability to communicate (clearly and in a timely and appropriate manner).
- The ability to relate with others. (e.g. empathy, self confidence and teamwork)
- Degree of self-motivation.

Observation

So although we are limited by our genes as to the maximum extent we have these abilities, education determines the extent we get to performing at maximum or optimum levels for ourselves. The education system needs to be appropriate to a wide range of abilities and not merely the median. It is of note that statistically virtually half a school’s intake is likely to have an IQ of 100 or less.

Nurturing

The second factor is the effect of parenting both during formative years and the support given by parents during the period of basic education. Some parents also encourage their children to participate in external activities, such as scouting, piano playing, swimming or football which further extends their maturity and self awareness. Other parents do not make any positive attempt to broaden their child's outlook and in extreme cases regard children as a hindrance. In scenarios where 'abandoned', some children self explore and can become more 'streetwise' as a result.
A useful paper from Australia clarifies the oft repeated falsehood that the family with low socio-economic status (SES) adversely affects a range of educational outcomes (Factors Influencing the Educational Performance of Students from Disadvantaged Backgrounds by Gillian Considine (Australian Centre for Industrial Relations Research and Training University of Sydney) and Gianni Zappal (Research and Social Policy Team The Smith Family)).
The authors found that some first-generation immigrant parents (e.g., Cuban, Vietnamese) through the process of migration and subsequent incorporation in the host society, come to see education as a key means of upward mobility for their children, despite their own low levels of education and income (Portes and MacLeod, 1996). Children from these communities did well despite coming from low SES backgrounds whereas the negative effects of SES were not ameliorated in the academic performance of children from immigrant communities with low levels of social capital (e.g., Haitian, Mexican).
Other studies based on Census data suggests that the second generation (especially those of European, Indian and Chinese origin) have achieved substantial educational mobility in terms of staying on at school, compared to those from British, German, Dutch and Australian origin (Birrell and Khoo, 1995; Khoo, 1995). As a consequence, higher percentages of children from non-English speaking background (NESB) achieve tertiary qualifications compared to those from English-speaking background (ESB) (Birrell and Khoo, 1995; Dobson et al., 1996). As with the US research, however, there is a great deal of variation between different ethnic groups. Studies have found that it is more likely that people from Vietnamese, Chinese, Eastern European and Korean backgrounds are in higher education than people from ESB. Whereas those whose language group was Arabic, Khmer and Turkish were half as likely to be in higher education than those from ESB (Dobson et al., 1996; Cahill, 1996; see also Marks et al., 2000).

Observation
Rather than the social background being important, the focus needs to be on the nature of parental support. There are three distinct scenarios in play here.

- Parents who provide at least an adequate level of nurturing.
- Parents who do not provide nurturing, but their children are interested in being educated. The framework needs to enable these pupils to easily access material and human support as necessary.
- Parents who influence the children negatively. This scenario is outside the scope of this document and any solution should be subject to a politically derived framework. Suffice to say the framework solution needs to identify these children in an objective manner so that any agreed solution can be put in place.

Environment

This section addresses influences on a pupil due to factors outside of the parents' direct control such as:

- The presence of similarly aged siblings. Single children have a different perspective from those who have come from a larger family. This is evident in their (in general) more mature

relationship with adults and the lack of experiencing a close bond with similarly aged siblings.
- A child's standing with their siblings, for example the eldest will often have a different perspective to number two. Siblings may also suffer from some form of disability or characteristic such as OCD which influences a child's understanding of life.
- The closeness of the full family for example where children are close to grandparents and possibly have to provide support as the grandparents age.
- The wealth of the family, approach to materialism, provision of food (ready meals or prepared at home)
- Interaction with local children, extent of being streetwise and extent of understanding nature.

Observation
A child's home environment cannot be changed and so this paper will only suggest a requirement to ensure a record should be made of each child's environment and then appropriate processes followed if behavioural or absence issues arise. Fortunately the impact of environment decreases with time, although it does impact the child during adolescence.

There is a key exception to the above associated with the arrival of the mobile phone. This product means fewer parents are actively engaging with their children (e.g. mothers talking on phones whilst pushing buggies and not having eye contact with their children). Similarly children are also spending less time in a family dialogue environment as result of television, access to social media and individual video streaming. All of which reduces the full range of non-verbal communication components normally associated with any dialogue. This mindset appears to carry through into later life. Consequently any future framework, whilst taking advantage of pupils mobile phone skills, needs to promote the learning of body language and encourage direct human interaction.

Current practices

Initial educational approach

Currently UK government guidance is that children must start school the September after their fourth birthday. There are various views on the wisdom of children starting school together with a physical age variance of at least a year. Taking account of children born pre-term/ post-term, the physical age range of the intake could be as great as 14 months. If one takes into account the natural genetic differences in development, the intake could have a mental maturity variance of up to 2 years. Anecdotally, parents with the youngest children in the class, consistently find their children are getting the lowest marks even though their innate ability is on a par with the oldest in the class.

A recent report in the British Medical Journal [PPE01] has reinforced the concerns about mental health. The annual incidence of self harm was observed to increase in girls (37.4 per 10 000) compared with boys (12.3 per 10 000), and a sharp 68% increase occurred among girls aged 13-16, from 45.9 per 10 000 in 2011 to 77.0 per 10 000 in 2014. Referrals within 12 months of the index self harm episode were 23% less likely for young patients registered at the most socially deprived practices, even though incidences were considerably higher in these localities. Children and adolescents who harmed themselves were approximately nine times more likely to die unnaturally during follow-up, with especially noticeable increases in risks of suicide (deprivation adjusted hazard ratio 17.5, 95% confidence interval 7.6 to 40.5) and fatal acute alcohol or drug poisoning (34.3, 10.2 to 115.7).
The following is an extract from an article by Dr David Whitebread, a Senior Lecturer in Psychology and Education at the University of Cambridge (http://www.cam.ac.uk/research/discussion/school-starting-age-the-evidence).
"*A recent letter signed by around 130 early childhood education experts, including myself, published in the Daily Telegraph (11 Sept 2013) advocated an extension of informal, play-based pre-school provision and a delay to the start of formal 'schooling' in England from the current effective start until the age of seven (in line with a number of other European countries who currently have higher levels of academic achievement and child well-being).*
There are several strands of evidence which all point towards the importance of play in young children's development, and the value of an extended period of playful learning before the start of formal schooling. These arise from anthropological, psychological, neuroscientific and educational studies. Anthropological studies of children's play in extant hunter-gatherer societies, and evolutionary psychology studies of play in the young of other mammalian species, have identified play as an adaptation which evolved in early human social groups. It enabled humans to become powerful learners and problem-solvers. Neuroscientific studies have shown that playful activity leads to synaptic growth, particularly in the frontal cortex, the part of the brain responsible for all the uniquely human higher mental functions.
In my own area of experimental and developmental psychology, studies have also consistently demonstrated the superior learning and motivation arising from playful, as opposed to instructional, approaches to learning in children. Pretence play supports children's early development of symbolic representational skills, including those of literacy, more powerfully than direct instruction. Physical, constructional and social play supports children in developing their skills of intellectual and emotional 'self-regulation', skills which have been shown to be crucial in early learning and development. Perhaps most worrying, a number of studies have documented the loss of play opportunities for children over the second half of the 20th century and demonstrated a clear link with increased indicators of stress and mental health problems.
Within educational research, a number of longitudinal studies have demonstrated superior academic, motivational and well-being outcomes for children who had attended child-initiated,

play-based pre-school programmes. One particular study of 3,000 children across England, funded by the Department for Education themselves, showed that an extended period of high quality, play-based pre-school education was of particular advantage to children from disadvantaged households."

Observations

- There is evidence that only having a yearly intake is detrimental to some pupils.
- Starting chalk and talk teaching too early increases the level of mental health problems
- Learning through play is beneficial

Personal Relationships

Education brings together a wide range of individuals with different backgrounds and characteristics, over the crucial period which includes adolescence. During this time individuals become more self aware and learn how to exploit their strengths. Not only are other pupils impacted by this, it is apparent that teachers who are may be having a low period in their own life are susceptible to the opportunities that this period presents. To cater for this situation, society provides guidance on both bullying [PPE18] and teachers' rights [PPE19]. The BBC reports [PPE20] that at least 959 teachers and school staff have been accused of having a relationship with a pupil in the past five years. The Diana Award's Anti-Bullying Campaign reports [PPE21] in the UK more than 16,000 young people are absent from school because of bullying and 7 in 10 young people aged between 13 and 22 have been a victim of cyberbullying (2013). In addition 60% of 13 to 18 year olds have been asked for a sexual image or video of themselves.

Observation

Schooling has two distinct learning elements, namely structured (classroom and team sports) and unstructured (playground and online). In both environments the school and society have a responsibility and role in minimising the opportunity of bullying. The framework solution must provide for

- pro-actively providing environments where the opportunity for bullying is reduced
- ensuring pupils learn that society works best with all working together as a team recognising their individual strengths and weaknesses.

It must have a single model for addressing bullying when it occurs in a manner not detrimental to the victim, since some pupils are severely disadvantaged by unstructured mixing of the full range of pupil behaviours and ages, especially during adolescence.

Grouping pupils by birth year

There are a number of groups promoting the concept that mixed ability classes fare better than those which are have been set on the basis of 'ability'. However on reading web posted articles a number of themes repeat themselves

- It is easy for students to get frustrated in a class of mixed ability. Stronger students may feel held back, weaker students may feel pressured. [PPE07]
- Children placed in the bottom stream do worse in maths and reading in Key Stage 1 assessments than similar children in mixed-ability classes, even after adjusting for social and

parental background. But those in the top stream do better than their peers in mixed-ability classes. [PPE10]

- A new study[PPE08] contradicts the popular theory that students perform better when surrounded by higher-achieving classmates. Michigan State University's Scott Imberman and colleagues found that marginal students in a middle school gifted and talented program — despite learning alongside the "best and brightest" -- performed no better on national tests than a similar group of students who didn't qualify for the program. This paper is part of a growing body of literature suggesting that just because you have stronger peers doesn't necessarily mean you are going to perform better.
- University of Nottingham study[PPE09] identified that there are risks to setting and the problem is associated with the mindset of the teacher.
    - In Boaler's previous study (Boaler, 1997b) at least one-third of the students taught in the highest set were disadvantaged by their placement in this group, because they could not cope with the fast pace of lessons and the pressure to work at a high level. The students that were most disaffected were very able girls, apparently because able girls, more than any others, wanted to understand what they were doing — in depth — but the environment of set 1 classes did not allow them to do this.
    - Students in low sets at the four schools appear to be experiencing the reverse of the students in high sets, with repercussions that are, if anything, even more severe and damaging. Indeed, the most worrying reports of the implications of the setting process for students in our sample came from students in low groups. These students reported a wide range of negative experiences, substantiated by observations of lessons. These included a frequent change of teachers (in one school the 'bottom' set had been taught by 3 different teachers in the first 9 months), the allocation of non-mathematics teachers to low sets and a continuous diet of low-level work that the students found too easy.
    - In the same way as the 'top set' teachers had fixed ideas about the high level and pace of work students should have been able to do, the low set teachers had fixed ideas about the low level of work appropriate for 'bottom set' students. The students reported that teachers continued with these ideas, even when students asked them for more difficult work.
    - Perhaps the most surprising finding is that setting did not appear to accomplish the one thing that it was designed to do, namely allow teachers to match the work set to the strengths and weaknesses of individual students. Teachers in the four schools in our study that used ability grouping responded to the move to setted teaching by adopting a more prescriptive pedagogy
    - When the students were asked if work they were given was at "the right sort of level", the proportion of those taught in mixed-ability groups who said that the work set was 'usually about right' for them was actually higher (81%) than that for those taught in ability-groups (77%). Interestingly teachers of set classes did not use the 'mixed ability approach to lessons which would have addressed all of the above.

Observations

a) Research papers reporting that setting is detrimental to weak students only look at results and not causes.
b) Weaker sets in schools are given weaker teachers.
c) Teachers are consistently bad at adapting the speed and depth of teaching material to the capability of the pupils in the class. Teachers expectations are that bottom sets are no good even when the pupils complain the material is too easy and slow.

d) Anecdotally it is reported that the real reason for mixing classes is so that not all the disruptive pupils are with each other in the bottom class. It appears the less dominant disruptive pupils succumb to peer pressure in the upper sets and misbehave less.

Overly dependence on classroom rote learning

It is universally accepted that one cannot teach an individual to swim or ride a bike just by classroom tuition. In 270 B.C., Sophocles said, "We learn by doing. That is the thing. For though you think you know it, you have no certainty until you try."
Skemp [PPE06] argued that it is not enough for students to understand how to perform various mathematical tasks; they must understand why. He used the term “relational understanding” and explained that it is an appreciation of the underpinnings, ideas and relationships in mathematics.
The first of the threads of proficiency is conceptual understanding, which is the why of mathematics. It is the ability to understand mathematical concepts, operations, and relationships, and the contexts in which they are useful.
The second thread of procedural fluency is the skill of carrying out procedures flexibly, accurately, efficiently, and understanding the context in which the procedures should be applied.
The third thread of proficiency is strategic competence, which is the ability to formulate, represent and solve mathematical problems using effective strategies. Devising a strategy includes being able to manipulate the process of problem-solving by formulating and selecting approaches. Students with strategic competence will exhibit conceptual understanding when they select and organize their solution, and procedural fluency when they carry out their strategy with efficiency.
The fourth thread of proficiency, adaptive reasoning, is the capacity for logical thought, reflection, explanation, and justification. It is not enough to just select and carry out a strategy. Deductive reasoning is used to make conclusions using facts, definitions, rules, or properties. Mathematics learning develops when people are able to articulate the proofs and mathematical decisions they made, including: why a certain strategy was selected, why it was the most effective, and how they know they were successful or not. With the assistance of representations, even young children can demonstrate their justifications and reasoning. It is important to consider that, “it is not sufficient to justify a procedure just once... Students need to use new concepts and procedures for some time and to explain and justify them by relating them to concepts and procedures they already understand”.

In Australia, there is particular awareness of the limitations of rote learning from the experience of Asian students coming over to study at University. A research paper[PPE16] by a Chinese student reports on a survey of 78 first year to fourth year Asian international undergraduate students at a South Australian University. The paper notes that

- The teaching style in Asian countries is more teacher centred, where the teachers or lecturers would give all or most of the information to the students. This makes the learning easier for students because they don’t need to look for more knowledge themselves.
- It is clear that Asian assessment systems requires students to remember all that they have learnt and to reproduce their learning in the examination in order to do well.
- Asian students prefer the more practical oriented Australian programs here. They feel that what they learn here is more meaningful to them. It is quite different. What you learn in Asia is more based on theory. Here we are provided with more practical things to do. Which makes what you learn sound more real to you.

- In Australia, critical thinking is very important. Asian students indicate that in Malaysia we can memorise all the things. The exam test recall rather than the ability to apply the knowledge.
- In Australia, the hardest thing for me is to take down lecture notes, because I never had to do that before. In Asia, teachers would give out notes, coming here certain lectures we have to write our own notes, which is pretty hard because we are not used to it. By the time you finished writing, the lecturers are way out and you may miss part of it.
- Generally, Asian students do not have much experience in teamwork. They found it difficult to work in a team especially with members that are not cooperative and unreliable.

An article by Nicola Yelland [PPE17] (Professor of Education, Victoria University) expresses concern about Australians being mislead by thoughts of Australian Schooling following Asian teaching techniques because East Asian countries appear at the top in world education rankings. She had recently returned from working in a teacher education institution in Hong Kong and conducting research in local schools that involved systematic observations of 3 to 15 year-olds in low socio-economic zones and notes the following

- Singapore's teacher education program has cut subjects such as the history and philosophy of education and curriculum and assessment design because these subjects are not assessed in PISA (an OECD sponsored literacy, numeracy, science and "problem solving" exam).
- It is claimed the problem-solving aspect of the PISA test ensures that rote learning cannot explain this performance. But Hong Kong students practice books are full of the examples of "problem solving". I can assure you that you can teach problem solving strategies like the ones included in PISA, and in fact, you can practice them day in and day out.
- The Program for International Assessment (PISA) 2004 context information findings were that Hong Kong students had a bad perception of their schooling with more than half claiming school had done little to prepare them for adult life.
- I have been in situations where I have asked Asian students "what do you think?" And they reply "tell us what you think and we will think the same". Is that really the mark of a gold star education system?

Observation

- Rote learning in itself does not educate a child fully
- Assessments need to focus on understanding and application
- Society behaves in a simplistic manner wanting to keep up and align with other societies.

Use of Academic Results

The UK Department Of Education published Implementing the English Baccalaureate in July 2017 [PPE15]. In the introduction the Secretary of State stated 'To become a great meritocracy, we need an education system which ensures that everyone has a fair chance to go as far as their talent and hard

work will allow. We need to remove the barriers that stop people from being the best they can be, and ensure that all children are given the same chances through education to succeed.' This is followed by the statement 'I would like to see 90% of pupils starting to study GCSEs in the EBacc combination of subjects (English, maths, science, history or geography and a foreign language) in 2025 as these are the subjects which at A level, according to the Russell Group, open more doors to more degrees'.

In the UK in 2013, following a review by Ofqual in 2013, it was decided that GCSEs should be based on a single exam in which pupils will be allocated a number grade based on their mark as opposed to an alphanumeric rating. But in reality the principle of a single exam remains in place. Conversely Trinity College London offers individual exams to establish which grade of capability a student is at. Specifically they state: Our graded music exams offer the choice and flexibility to allow candidates to play to their strengths, enabling them to gain recognition for their own unique skills as performers.
Our music exams:
Recognise that a flexible approach is best, prioritising candidates' individual needs
Offer freedom of choice within assessments, enabling candidates to demonstrate their musicianship in the way that suits them best
Assess real-life skills that translate naturally from real music-making to the assessment
Assess skills that are specific to each discipline – the opposite of a one-size-fits-all assessment
Allow candidates to express their whole musical personalities through options to demonstrate creativity in different ways
Use diagnostic mark schemes where appropriate, offering precise and specific feedback to inform continued learning. Trinity College London's graded exams are numbered from 1 to 8 in increasing order of difficulty.

Observation
a) So in effect, there are 2 distinct types of assessment. One is incremental allowing a student to progress when it is clear the previous phase has been mastered. The other is a big bang approach attempting to grade progress at a single sitting without incremental feedback to the student during the period of study. The big bang approach focuses on memory, whilst the incremental approach is more focussed on real world scenerios.
b) The assessment is on academic ability and not whether the pupils have achieved their potential and are able to lead happy and healthy lives.

Comparison of schools

Each year in the UK tables are published of the academic exam results of each school. The major debates are whether the focus should be on valued added rather than absolute level of achievement. An Australian Paper – REPORTING AND COMPARING SCHOOL PERFORMANCES would appear to provide the most objectively reasoned recommendations.

- Although it has become popular in education systems in some other parts of the world to use statistical models to develop 'measures' of school performance and to report these measures publicly in league tables, we believe that there are very sound technical and educational reasons why school measures of this kind should not be used for public reporting and school comparisons.
- Related to this point, we are not convinced of the value of reporting 'adjusted' measures of student outcomes publicly. Measures of student outcomes should be reported without adjustment.

- Nationally comparable data should be collected on the percentage of students in each senior secondary school completing Year 12 or equivalent; the percentage of students applying to all forms of post-school education and the percentage of students completing VET studies.
- Nationally comparable data should be collected on the early literacy learning of children in each primary school. These assessments will need to be developed and should be administered upon entry to school and used as a baseline for monitoring progress across the first few years of school.
- Nationally comparable data should be collected on the tertiary entrance results of students in each senior secondary school.
- For the purpose of providing public information about schools, a common national website should be used to provide parents/caregivers and the public with access to rich information about individual schools. The national website should provide information about each school's programs, philosophies, values and purposes, provided by the school itself, as well as nationally comparable data, provided centrally.

Observation

- Comparing the performance of schools based on academic performance is not a meaningful approach. The comparison should be informed by all aspects of education and behavour.
- Most schools are so geographically separated, except in larger conurbations, that parents do not have a choice as to where to send their children.
- Commercial organisations delivering services from geographically dispersed locations (e.g. McDonalds, Holiday Inn) focus on ensuring a consistent quality of service and consumer satisfaction from all locations.

Suitability for employment

The feedback from 'industry' is that the current education system does not adequately prepare pupils for work. The following points emerge from newspaper reports

- Telegraph –
  - The research from the National Institute for Economic and Social Research found that recruiting skilled foreigners allows companies to become more efficient and expand their businesses.
  - The economists' findings follow a government-backed study this week showing that foreigners are filling a fifth of jobs in key industries such as engineering because of a lack of skills in Britain.
  - The study may fuel the debate about whether British workers have the skills and work ethic needed to compete with foreign counterparts in an increasingly international labour market.
  - The researchers studied official figures on employment and concluded that foreign workers employed in Britain are on average better-educated and work longer hours than British recruits
- Daily Mail – The report, by two Finnish academics, was presented yesterday to a conference on migration at University College London organised by NORFACE, a European organisation of state-funded research councils.
  - It said that while Eastern European workers in Britain are more likely to have jobs than locals, their jobs are often among the most low paid.
  - This appears to support the long-held argument that many migrants are more willing to take low-paid jobs than those of British birth. As early as 2007, official figures showed that four out of five newly-created jobs were going to migrants.
  - In 2015 greater shares of foreign-born men were employed in professional occupations (e.g. software professionals and health professionals) and in the two lowest paid

occupations: elementary (e.g. cleaners, kitchen and catering assistants) and processing occupations (e.g. transport drivers, food, drink and tobacco process operators), compared to UK-born men. About 30% of foreign-born male workers were employed in elementary and processing occupations compared to 20% of their UK-born counterparts

- Migration Observatory [PPE12] reports that in 2015 the industry with the highest share of foreign-born workers in its workforce was food products manufacturing, where about 41% of the workforce was foreign-born. The sector with the second highest share of foreign-born workers was manufacturing of wearing apparel (34%) followed by domestic personnel (31%).
- The Daily Telegraph has published the results of a Chartered Institute of Personnel and Development (CIPD) poll [PPE13].
  - Many of the 1,000 British businesses polled were making a "rational decision" to hire foreign labour
  - The most common reason given, by 26 per cent of firms, was "difficulty attracting UK-born candidates to fill unskilled or semi-skilled jobs".
  - A fifth of companies said foreign workers had better work ethic or motivation than home-grown candidates.
  - This highlights a particular need for even greater efforts to close the gap between education and work by government, business and employee representatives, to provide better guidance and support to young people, and help create a more level playing field by improving their employability skills and therefore employment prospects, especially the low-skilled and unskilled."
- The Express (https://www.express.co.uk/news/uk/493879/EU-migrants-snatch-jobs-from-UK-workers)
  - The Home Office Migration Advisory Committee report published earlier this month found that between 1997 and 2013 the number of Britons in low-skilled jobs fell by 1.1 million. Almost all of those jobs were filled by foreigners.
- Huffington Post (https://www.huffingtonpost.co.uk/entry/hidden-price-unpaid-internships_uk_5a8af9dbe4b05c2bcacddf2b?utm_hp_ref=uk-homepage)
  - A degree is worth "absolutely nothing" without unpaid internships, according to graduates who say they were left disheartened and disadvantaged when they couldn't afford to work for free to progress their careers.
  - Unpaid work that can last for months has created an elitist system, meaning that "only the rich or London-based applicants stand a chance" in some careers, young people said, after it emerged that it now costs over £1,000 month to do an unpaid internship in the capital.
  - "Within the fashion industry, experience is everything - without any internships under your belt, it would be nearly impossible to secure a job post-graduation," a University of Huddersfield undergraduate said.
  - Louise Pantani, a 25-year-old from Woolwich, is currently working in media and PR but has been trying to break into book publishing for the last three years. "Without having done at least three different internships, which are usually unpaid, you don't have a chance of getting looked at when you apply for proper positions," she explained.

Observations

- By focussing education on academic skills, the UK is failing to produce motivated applicant for skilled and semi-skilled jobs.
- There is no structured path from education into any career or job

Employment Context

Numbers

Recent figures for employment in the UK for 2017 identifies the breakdown by industry

This section to be updated since the included table did not convert to Microsoft word format

Looking at the artistic element of these jobs the The UK creative economy comprises an estimated 2.04m jobs in the creative industries and creative jobs which are in non-creative organisations (e.g. design or marketing teams within manufacturers). The creative industry itself employs another 900,000 who are not in creative roles.

Observation

It is self evident that the scope of the educational syllabus is irrelevant to most real world jobs.

Career Requirements

Examination of the UK Careers advice website shows that many jobs do not require GCSEs at all and in virtually every case a skill is required that is not within the scope of the current educational syllabus. For example the identified skills for a market trader are

- excellent sales and negotiation skills
- the creativity to set up an attractive stall
- business and maths skills
- spreadsheet or bookkeeping skills

Further analysis indicates that there are a considerable number of jobs where skill training is required (gas, plumbing, electrician, carpentry etc.). The education system should provide for this training to be available ‘locally’ so that pupils do not have to incur accommodation expense to achieve their certification.

The final conclusion is that only a subset of careers that really require degree qualifications. Recognised entrepreneurs (Alan Sugar, Richard Branson) have become successful without formal training and the passing of exams. How many historical great artists, authors or composers had formal degrees?

Observations

- The current UK education system is not educating people appropriately for society and work in later life.
- The focus on rote learning results in pupils with less creative or analytical think ability.
- ‘Home-grown candidates’ are reportedly not motivated to work.
- University degrees do not open the door to expected jobs.

- Some employers are minimising training costs by exploiting a surfeit of applicants and benefiting from unpaid internships.

Alternative Approaches

The Finnish Educational System [PPE04]

When Finland gained independence in 1917, Finland was one of the least advanced economies in Europe. Today, it is one of Europe's richest and most successful nations. In fact, according to the World Economic Forum, Finland has the world's most competitive economy. Finland's education system is one of the best in the world and generates people with the right skills to succeed in a modern knowledge economy. In the last fifteen years, Finland's students have performed at world-class levels on all of the international tests comparing student performance. The Finnish Educational approach can be summarised as follows.

- Most pupils (98%) spend approximately four to five hours per day in pre-school focused on play and preparation for primary education.
- Primary education begins at seven.
- All students attend nine years of school where instruction during the first six years is usually taught by a class teacher and the last three years by subject specific teachers.
- National standards are identified not for each grade, but at transition points in schooling e.g., for grades 1-2; grades 3-5; grades 6-9 and also criteria for a final subject assessment in Grade 8.
- All students in basic education and general upper secondary school receive counselling in how to study, career planning and how to choose their next phase of education.
- In secondary schools, each pupil is allocated a counsellor who remains with them throughout. Each counsellor works with approximately 80-100 students.
- Students who choose vocational upper secondary school attend a three year program that includes a minimum of six months of on-the-job-training. Forty-five percent of Finnish students work toward a vocational qualification.
- The majority of eligible school leavers in Finland now elect to go to a polytechnic rather than a university.
- Teachers identify students having problems and arrange for extra help during or after school.
- There is no final exam covering all aspects of basic education.

The Steiner Approach

The priority of the Steiner ethos is to provide an unhurried and creative learning environment where children can find the joy in learning and experience the richness of childhood rather than early specialisation or academic hot-housing. The curriculum itself is a flexible set of pedagogical guidelines, founded on Steiner's principles that take account of the whole child. It gives equal

attention to the physical, emotional, intellectual, cultural and spiritual needs of each pupil and is designed to work in harmony with the different phases of the child's development. The core subjects of the curriculum are taught in thematic blocks and all lessons include a balance of artistic, practical and intellectual content. Whole class, mixed ability teaching is the norm.

Steiner education has proved itself adaptable. More than 80 years after the first Steiner school was started in central Europe, this education continues to inspire people from all walks of life and in all parts of the world. Steiner schools have a reputation for producing well-rounded and balanced human beings who are able to cope with the demands of a fast-changing and uncertain world.

In the primary years children form a strong social group with their class, often having the same teacher throughout their primary years. This creates a unique bond between the class and teacher and helps build strong school communities. The Main Lesson is a unique feature of Steiner education, aimed to deepen, enrich and unify the learning experience. It is a unit of work on a particular theme/subject and is studied each day for 3-4 weeks. Teachers develop a wide range of artistically and academically integrated and related activities around the central theme. Each Main Lesson relates to the students' stage of development for that year and is linked to other subjects, building upon prior knowledge, experience and skills in creative ways that engage students in their learning. Steiner graduates are highly sought-after in further education and work place for their unjaded interest in the world and their resourcefulness.

The Montessori Approach

The methodologies applied in the schools of Dr. Maria Montessori are based on a philosophy of education that recognizes children's preference for control over their own learning. The goal of education is to make learning enjoyable.

- Children love freedom of choice when it comes to activities. That is why Montessori went to such pains to understand and define the appropriate "prepared environment" for her students, depending on their developmental stage. The classroom was set up with carefully constructed learning aids (called didactic materials) and manipulatives of all kinds. The children were left free to decide what they wanted to work at or, for that matter, they could decide to do nothing at all. Of course, Montessori recognised that one is only free when one has options, otherwise one has no choice; hence the considerable variety of stimulating learning materials that she prescribed and prepared for her classrooms.
- Children have "amazing mental concentration" when their interest in anything is spontaneous. Hence the importance of the "prepared environment" designed to naturally capture a child's interest and stimulate the desire to learn. This interest and desire to learn will be fostered in the classroom in which children have access to a range of computer-based learning systems alongside other more traditional learning tools.
- Children love repetition of material even when it is already known. Montessori describes this as a "profound psychological need" during the early years of a child's education. An appropriately programmed computer can be an invaluable vehicle for such repetitive activity because, unlike teachers, it never gets tired. One only has to watch children playing video

games to know how easily and exhaustively children are motivated by engaging computer-based activities. When those activities have the added value of being educationally constructive, it seems sensible to take advantage of the computer's motivational capabilities.

- Children prefer work to play. The distinction between work and play is an artificial one. Naturally, when work is perceived as play it will be preferred over activities that are perceived as less enjoyable. One of the problems in too many classrooms is that the teacher-pupil ratio is still so high that it is difficult to provide an environment where children can be allowed to "do what they want." The computerised classroom can go a long way to overcoming the problem of numbers. Classes can be more easily broken up into small groups, or individuals can be left to work on their own. So the teacher becomes the facilitator of learning, rather than the source of it.
- Children love silence. When we are trying to think, we usually find noise a distraction. Children will be the first to appreciate the opportunity to work undisturbed. That is why teachers place so much emphasis on discipline in class; not to stifle intellectual activity, but to maintain an environment in which it can flourish. Classrooms in which children have access to computer-based learning systems, while still needing adult supervision, often will not need much of it because the children are engaged. Children "explode into writing" once they have learned the letters of the alphabet and the sounds they represent. Children do not need to be taught to write. Montessori students first learned the letters and the sounds they represent; that led naturally to the discovery of an ability to construct written words. It was only several months later that they learned to read those written words.
- Children are spontaneously self-disciplined and extremely obedient in a Montessori classroom. The reason is simple: the children are engaged in activities of their own choice that absorb their attention, thus obviating much of the need for externally applied discipline.

The paper Academic Achievement Outcomes: A Comparison of Montessori and Non-Montessori Public Elementary School Students. The paper itself limits its findings to the scope of some academic aspects which can be summarised as follows: The five-year-old Montessori students scored better than their non-Montessori peers on several of the reading sub-tests and in some social situations as measured by the researcher -created vignettes. The twelve-year-old Montessori students had stronger creative writing skills than their non-Montessori peers, but reading skills of the two groups were similar. Montessori students who were twelve years old had higher scores on the social skills measures than non-Montessori students.

Distance Learning

There are various approaches to distance learning some of which the learning is all remote but the general approach is to supplement individual distance learning with group sessions.

Australian School of the Air.

School of the Air is a generic term for correspondence schools catering for the primary and early secondary education of children in remote and outback Australia where some or all classes were

traditionally conducted by radio, although this is now being replaced by internet technology. In these areas, the school-age population is too small for a conventional school to be viable. Each student has direct contact with a teacher in an inland town such as Broken Hill, Alice Springs or Meekatharra. Each student typically spends one hour per day receiving group or individual lessons from the teacher, and the rest of the day working through the assigned materials with a parent, older sibling or a hired home-stay tutor.

Traditionally, the students received their course materials and returned their written work and projects to their hub centre using either the Royal Flying Doctor Service or post office services. However the extension of Internet services into the outback now enables more rapid review of each child's homework. As the children are in isolated situations, the School of the Air is frequently their first chance of socialisation with children outside their immediate family. This is supplemented by 3 or 4 annual gatherings where the children travel to the school to spend one week with their teacher and classmates.

Studies have shown that such education has a parity with, if not better, standards than traditional methods of schooling.[15]

Open University (UK)

The Open University (**OU**) is a public research university and the largest university in the UK for undergraduate education. The majority of the OU's undergraduate students are based in the United Kingdom and principally study off-campus; many of its courses (both undergraduate and postgraduate) can also be studied anywhere in the world.[5] In October 2006, the OU joined the Open educational resources movement with the launch of OpenLearn. A growing selection of current and past distance learning course materials will be released for free access, including downloadable versions for educators to modify (under the Creative Commons BY-NC-SA licence), plus free collaborative learning-support tools. In the early 2000s, the OU researched the use of virtual worlds in teaching and learning, and had two main islands in Second Life.[37] [38] In May 2009 these regions formed the basis of a case study[39] by Linden Lab, the company which owns Second Life. In mid-2010, the university led the list of contributing universities in the number of downloads of its material from the educational resources site iTunes U, with downloads of over 20 million.[40] In 2013, the OU began a Massive open online course (MOOC) platform called FutureLearn, which is the UK's largest provider of free online courses.

Computer Based Learning

CBL [PPE05] refers to the use of computers as a key component of the educational environment. While this can refer to the use of computers in a classroom, the term more broadly refers to a structured environment in which computers are used for teaching purposes. The concept is generally seen as being distinct from the use of computers in ways where learning is at least a peripheral element of the experience (e.g. computer games and web browsing). Since its inception, it has been a subject of close scrutiny and debate, with myriad arguments being advanced both in support of and against CBL. Some claimed benefits are:

- It provides quantifiable and instantaneous feedback for its users.

- It also often allows for educators to measure progress in an environment that is more structured than the typical classroom, limiting stress and allowing for a focus on non-technical elements of pedagogy.
- It is often seen as the most efficient and effective manner in which to conduct distance education, as a lesson plan can be created that allows people to study at their own pace. either via the Internet or software installed on individual computers at various sites.
- In general high quality e-learning offers a more effective learning model because it offers:
    - an immersive experience which more effectively engages and meets the individual needs of the learner
    - better long-term retention of information as activities can be reviewed to ensure full understanding (Hairstein (2007) – retention levels are 12% higher than traditional models)
    - learners have the ability to complete work at their own home, at their own pace; stop, reflect and repeat subjects as required and concentrate on the subjects they are less familiar with.
    - consistency of learning, where all participants get the same content, studies have shown that variance in learning across students was reduced by 50-60% .

The US Department of Education released a study in 2009 which stated "…that online learning today is not just better than nothing – it actually tends to be better than conventional instruction."

- Studies by Towards Maturity (2010) indicated that 69% of report participants indicated improved effectiveness of learning using online solutions.

Advantages of computer-based learning in primary and secondary education:

- The child has 100 percent of the computer's attention.
- A computer-based learning system gives the child complete control over the pace of learning. That echoes the aspiration of the philosopher George Bernard Shaw who said, "What we want is to see the child in pursuit of knowledge, not knowledge in pursuit of the child."
- Adaptive courses will adjust the delivery of the content based on errors made by pupils in answering questions of understanding which will be more tailored than a teacher in a classroom could ever be.
- There is reduced need for the purchase of textbooks since all material should be freely available online.
- The computer frees up the teacher for interaction with other children who might need more help.
- Using computer based testing can reduce the amount of marking a teacher has to do as well as automatically providing statistics of the class as a whole.

Side benefits are

- Pupils are able to study from home.
- Specialist teachers do not need to be geographically co-located with pupils.
- Reduced printing and distribution costs.
- Easier and faster to update as a result of changes.

Towards Maturity in a 2011 study, found that on average, business and organisations reported costs and average time savings of 26 and 31% through the use of e-learning. Whilst the savings for industry of staff cost savings will not be realised in the education system, other components of the savings will still apply.

Observations

- The Finnish model provides a proven sound base on which the framework could be built.
- Steiner's model emphasises the need for education to address physical, emotional, intellectual, cultural and spiritual needs of each pupil and the need for the solution to work in harmony with the different phases of the child's development.
- Montessori demonstrates that children learn well through play and structured play techniques can be evolved to cover all aspects of education.
- Computer Based Learning has matured to the point that it is now better than than conventional teaching. More importantly it means that a pupil's progress is less dependant on the local quality of teaching. The use of a computer reduces the impact of a poor teacher. It is also cost effective.

Proposed Framework

Context

To be all embracing, the scope of this framework needs to address

- The scope of the content that constitutes the minimum level of educational standard a pupil would need to achieve to be comfortable in society.
- The tools and approach to delivering all education.
- The alignment of the syllabus and the assessment of pupil's progress to the needs of society and the employment market.

For the purposes of this paper the phases of education are to be broken down into the following categories.

- Basic– the minimum level as postulated in the first bullet above.
- Primary Academic - roughly equivalent to GCSE's
- Secondary Academic – roughly equivalent to old fashioned A (1960's) level
- Tertiary Academic – Universities
- Vocational Training – education that prepares people to work in various jobs, such as a trade, a craft, or as a technician.
- Skill Development is the learning of specific skills which will assist the pupil in fulfilling some specific tasks (e.g. languages, guitar playing, painting, swimming, pottery, computer programming, nursing, engineering design, teaching, memorisation). Note this can occur in parallel with basic education and often is. Examples of early skill acquisition is evident with child prodigies. Note this term is different to vocational training where the teaching is to address specific career or job needs although it is recognised that for example a talented pianist can earn a living exploiting that particular skill.

The following summarises considerations in arriving at the solution.

- It is the genetic make-up (where the term make-up includes IQ, self motivation and maturity) of an individual that determines their academic ability in the educational phase of their life.
- It is the type of parental support that determines the attitude of pupils at school and not their social economic background.
- Not all pupils who start school have benefited from a normal nurturing education.
- Because of genetic, social and nurturing differences, provision for pupil segregation may be required in school playgrounds.
- Learning through play, rather than chalk and talk, results in happier and better educated pupils.
- Appropriate streaming is beneficial to all pupils as it should allow them to both proceed at their own pace and understand the material better.
- Not all teachers are equal either in lesson plan presentation or relating to the full breadth of pupil type (slow, bright, negative or positive attitude). To be fair to all pupils the outcome of the educational service must have minimal dependency on the quality of the teacher.
- The current UK exam model puts pupils under stress which is not representative of life and is of little relevance to life situations. The model of working through grades would seem better suited as all pupils will leave with a grade level in each subject, which is a more positive outcome for each pupil.
- The current mandatory 'academic' course syllabus is not aligned to career, society and individual life needs.
- The current university/college models of education do not ensure the establishments have to accept any responsibilities in delivering career beneficial output.

- There is no overall strategy in place to improve productivity, reduce the cost of learning, or make training available to those unable to easily get to a place of learning.
- Pupils are naturally geographically dispersed and there is no attempt to provide all pupils with equal opportunity to learn with minimal disruption to the environment.
- There is no closed loop with the needs of industry and the opportunities available to pupils. (Aligned to this there are no active steps being taken to ensure there are enough vocational places available to meet the forecast jobs market needs).
- There is currently no provision for pupils to learn about society, relationships, hobbies and charity work.
- There is no strategy to benefit from the introduction of technology even though it has been shown to be be beneficial, cost effective and provide quality services uniformly across the country.

Solution Approach

A central computer based learning service to be set up to **support** existing teaching facilities, those studying from home and mature students. It is envisaged this aspect of service will evolve over time and as technology improves and AI technology becomes more mainstream.

By reducing the time teaching staff spend on transmissive presentation of material to classes, teachers are freed up to run tutorial sessions ensuring pupil interaction thus partially compensating from the reduction arising from use of smart phone technology.

In order to balance out problems arising from culturally deficient parenting it will be necessary to augment the missing elements in children so identified on entry. Where it is apparent that the level of support provided by parents to pupils falls short of expectations positive steps need to be taken to rectify the situation. The particular steps will depend on the parental situation and this will be discussed further in the framework solution.

Society should mandate a single best practice framework model for all pupils. The framework needs to accommodate innate differences in children’s learning ability, maturity (as opposed to physical age) and motivation. Thus any published assessments should be made on relative progress rather comparison with a standard model and not focus only on academics. Where pupils rate of progress falls of in a particular area then it should be established if the pupils is reaching their limit or if there are other causes. If the rate of progress declines in all areas proactive steps need to be taken to understand the cause and remedy the situation.

Due to the increased number of immigrants to the UK (although with the large amount of population movement this applies to most countries), English culture, tolerance and charitable support needs to be explicitly taught as part of the education framework. The syllabus for the framework needs to include these expectations and pupils should be assessed to have absorbed these elements prior to completing the basic elements of education.

The framework implementation should allow for new pupils starting on a termly rather than on a yearly basis as at present. Grade testing will take place on a termly basis. The concept of a school year should be phased out.

The solution needs to provide transparency to the pupils in effectiveness of education and its suitability in providing the pupils the required skills and motivation for work. It should also provide a mechanism for grading all aspects of pupils (not just academic) so that they are aware of their own strengths and weaknesses.

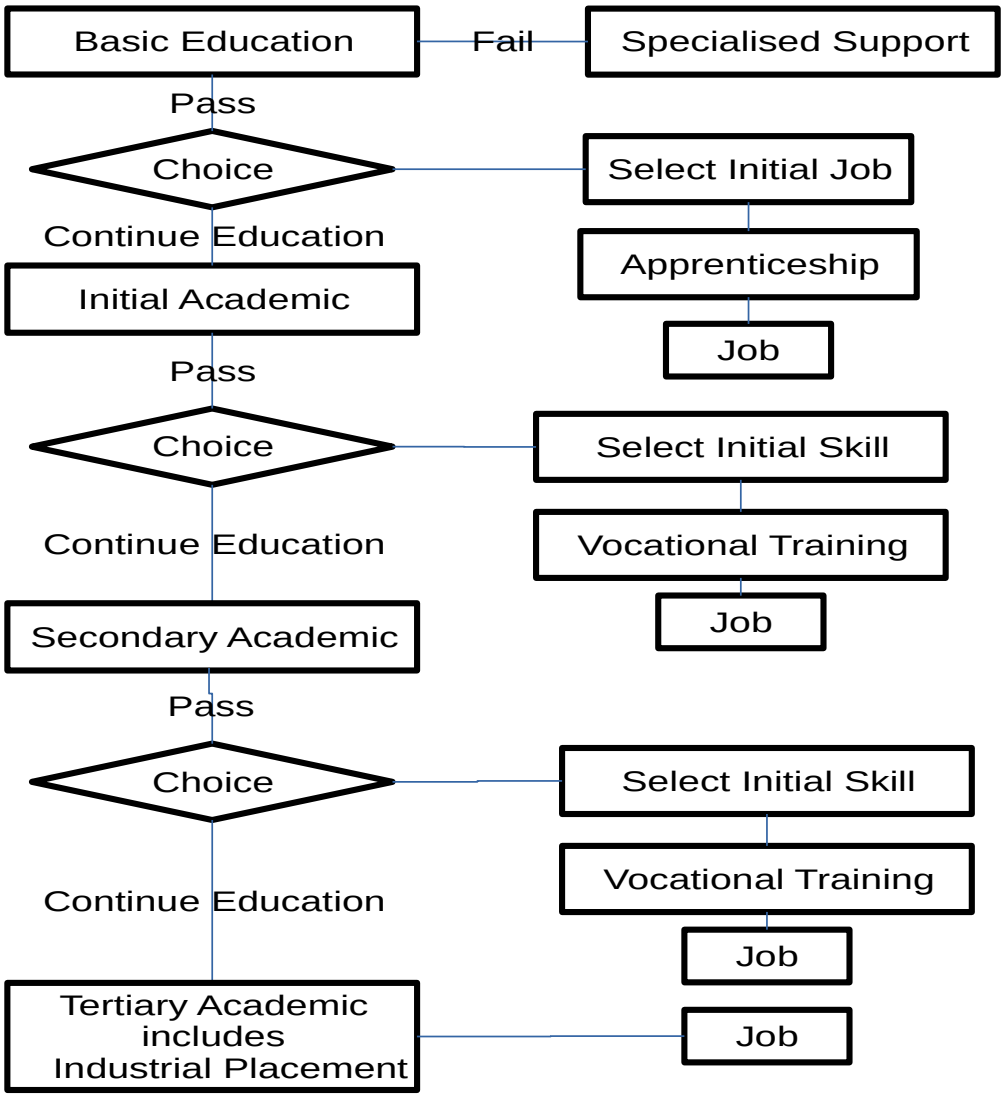
The learning model should be aligned with the instinctive learning characteristics of youth and adapt as pupils mature and become more ‘in-control’ during adolescence. Likewise it should balance the amount of rote learning with proactive learning to maximise the ability of individuals to both understand the information and apply appropriate processes. Education should exercise all pupils creative and physical skills and encourage development (e.g. sport, art, oratory) where natural ability is observed.

It may be that there are pupils who are unable fit into the standard framework model (e.g. for reasons of behaviour or restricted physical abilities), and society may need to provide a ‘standard specialised’ service to accommodate these pupils.

Given the above, a quality schooling framework needs to cater for the full range of abilities being carried out in a single framework. However there are strong social reasons (jealousy, bullying, uncouth behaviour) for institutions to provide appropriate levels of separation (multi-site if necessary). With the onset of adolescence, pupils relationship with school staff changes and thus the organisational framework needs to take account of this.

Proposed Framework Solution

The following postulates an overall educational flow-path for pupils.



The first observation is that education services supports all pupils from the time that they enter the system until they are contributing to society

It will be also noted the term Basic Education has been introduced. This recognises there are pupils who do not have the skill or aptitude to stay on into classical academic education. However they will leave the education system having made traceable progress and be shown to met the criteria identified in the proposed syllabus for Basic Education. To assist in the upcoming choices guidance will be available on which careers require what training, typical salaries and the number of

vacancies of each career type. The part time apprenticeship, which will include a period of charity work, will then conclude at the same age as current GCSEs thus a pupil will still be available to commence work formally at the same age as at present.

There will be those who are unable to meet the levels defined in the basic syllabus and society will assess the nature of their needs against nationally agreed criteria and provide a ‘standard’ support service appropriate to their need. The provision of this specialised service support will be addressed in a separate paper.

The solution recognises that one size does not fit all and consequently does not mandate any standards have to be obtained at predetermined ages. Each educational establishment will support at least two speeds of learning so that each pupils can progress at a speed better aligned to their natural ability. For consistency, irrespective of the speed of learning those passing exams at certain grades will all achieved the same standard. (No dumbing down in scope or pass criteria).

The educational services will be seen to deliver if the pupils meet the criteria outlined in the purpose of education above and the next generation of pupils are better prepared to

- enjoy life and live healthily
- contribute positively to society
- have improved ability to bring up their own children.

Scope of Basic Education

Basic education is the minimum scope of education level that it is deemed that an individual needs to have an enjoyable fulfilling life in today’s modern society. The following is an outline syllabus of basic education.

1. Reading
    1. The ability to read and understand basic material available in everyday life, e.g. shopping, directions, highway code, emails and messaging
    2. The ability to read and understand all published notices.
    3. The ability to read and understand forms e.g. employment contracts, loan agreements, rental agreements, purchasing agreements and other documentation together with their rights appropriate to daily life.
    4. Basic reading for enjoyment
    5. The ability to differentiate between humour, hatred, facts, opinion and false news.
    6. Understanding the differences between opinions expressed privately and those put in a public domain (social media).
2. Writing
    1. The ability to write joined up words neatly

2. The ability to form basic sentences (subject verb object).
3. The ability to write down what they say.
4. The ability to complete forms.
5. Touch typing on a keyboard (Important productivity issue for today's terminal based world).
6. Dictation. - The ability to construct sentences before opening one's mouth (Relevant as speech recognition becomes more pervasive).

3. Money
    1. Mental arithmetic (in head) addition and subtraction up to 500, multiplication and division up to 12
    2. The ability to understand buying and selling (pricing and tax)
    3. The ability to understand income (gross and taxes)
    4. The ability to understand saving and credit spending.
    5. The need to balance books and to be prepared for unexpected costs. (household accounts). Income from work being greater than outgoings leads to happiness.
4. Human and animal basic life-cycle. (the examples to include environment and pollution)
    1. Plants /Trees
    2. Fish (e.g. salmon as an example, polluted waters, dependency on lower forms of life for food.)
    3. Cows, Sheep, Hens (BSE methane, reproduction required for milk, to include end of life process – humane stunning)
    4. Humans.(need for support as babies, and also support when old. Introduction to health related services that society provides).
    5. Human relationships, Grandparent, parent, child (commitment to upbringing), partner (sexual attraction, best buddy, trust and respect) all changing over time. Best child nurturing practices.
5. Society.
    1. Provides an environment in which everybody benefits by virtue of contributing and supporting each other in a predictable manner. Examples of when society is not working. Morale standards and the law.
    2. Introduction to all services provided by society. (Policing, energy, water, drainage, education, health, security, transport).
    3. Private businesses deliver products and services compliant with framework established by society. (e.g. food and drug quality, product guarantees).

4. Introduction to charities. (expectation is each child will spend time working for a charity for at least 3 months as part of education (recorded on their CV)
5. Safety – risk areas, and extent of society protection. (e.g. crossing roads, railways, swimming in lakes, sea, drug taking. Buying unlicensed products off the internet, social media.
6. Sorts of job types available (whether employed or self employment) and their characteristics, pay rates and employment law. (characteristics to include people facing, physical team based or individual motivation see section on understanding self).
7. Geography – solar system, earth, nations, weather. Understanding maps and local travel
8. Lessons learned from history of different types of society (wars instigated by religions and personalities seeking power) and the need for a responsible free press and a balanced society benefiting from the correct mix of capitalism and government instigated national services.
9. Vandalism, gang warfare etc. only reduce the quality of life for all and never have a constructive outcome.

6. Science
    1. Solar system
    2. Continents – Weather
    3. Nations – maps, travel
    4. Materials
    5. Pollution
7. History
    1. Different types of society (wars instigated by religions and personalities seeking power).
    2. Rise and fall of civilisations
    3. the need for a responsible free press and free speech.
    4. correct mix of regulated capitalism and government instigated national services.
8. Self
    1. Physical – height, weight, balance, hand eye coordination reaction times, teeth etc. development over time from youth to old age. (Possible concept is that a medical technician assesses each child individually say 3 times during educational period. All collected data to be forwarded to child's National Health record.)

2. Mental health – Self awareness and inner confidence. How others see you and your view of your strengths and weaknesses. (Formal opportunity to capture potential mental issues and assist in management of same.)
3. Health Guidance – hygiene, eating and exercise guidance, first aid
4. Interests – reading, music, dancing, art, nature, sport, cooking. (Each child should have at least two interests, one have a physical side and one should include a social element.) Each day there should be a lesson on locally available 'interests' provided by a member of the local society. Each pupil whilst in education will be expected to spend at least a year as member of two societies as part of completing their CV.
5. Generation of curriculum vitae and interview techniques (to include referee selection and concept of mentors – each student to be encourage to have a teacher as a referee.)
6. Learning techniques and ways of assessment as appropriate to each pupil.

Assessment of each pupil will be based on a grading system for each of the above subjects. Each pupil needs to focus on their improvements and what is needed to further improve themselves rather than the progress of other pupils. (No one with any sense seeks to get all pupils running a fixed distance in a certain time just because they have reached a specified age. In sports, the focus is on improving one's personal best times (PBs) or equivalent). Once pupils have reached grade 10 in the above subjects they can move onto more academic studies which will be graded 11 to 20.

Centralised Education Services

These are services that are provided free of charge to all members of society using technology on a self-serve basis (although individuals within 'Society's Safety Net' may have professional assistance in benefiting from these services). A separate paper on the Pragmatically Perfect Provision of Structured Information and associated services will be provided in due course.

1. For each and every member of society benefiting from the education services there will be a record kept of progress through the system. Each individual will have full read access to their records. With the exception of the Curriculum Vitae element it should not be possible to export any element of the record. The solution should ensure that bulk search and export of record information is not possible.
2. At least two instances of computer based training will be provided for every element of the education (i.e. basic, primary and secondary academic and university) syllabus. One instance will assume the pupil is capable of 'faster than average' (e.g. top 50%) progress whilst the other instance will lean towards visualisation based education and progress the student at a rate consistent with the slowest pupil. The learning solution will include understanding and ability to apply testing every 15 -30 mins of course material. The ability to set 'homework' tasks will be included. For each learning module there will be a FAQ

facility together with pointers for further reading for those pupils who have an interest in the subject. This computer based learning solution will be augmented with human hosted chat room facilities for Q&A. This service will address the problems of

2.1. pupils unable to get to school for whatever reason

2.2. consistent support to pupils being educated at home

2.3. provision of specialist subject material where either local teachers are not available or inadequate number of pupils to warrant a local class.

2.4. Situations where pupils do not interact well with their nominated teacher.

2.5. Making the services available to mature students as providing a way forward for late developers.

3. Computer based homework support and elemental testing services will be provided. These will be available not only to those using computer based learning but also to students following conventional course base education to provide analytical feedback to teachers of their pupils understanding of the material. The benefit of this approach is it reduces the paperwork load on teachers from a marking perspective.
4. Centrally based Exam Services will be provided in two forms. In the first case a fully automated based exam, answer and marking service will be provided, in the second case the questions will be provided in electronic form and the student's response will be captured conventionally on paper and marked conventionally. Key to this is that each student will be given randomised questions in each area to minimise rote input. Again with multi-choice answers the order of choice will be individually randomised.
5. A society (non-commercial) hosted datastore should be provided for teachers to share lesson plans and textbook material on a creative commons license basis. For example the operational mode could be a Wikipedia approach, but one which allows multiple entries for each module with users voting which they found most helpful. This facility allows teachers who are poor at writing lesson plans to benefit from those who can. This datastore should also providing free computer based text books. (This service all contributes to reducing the price of education.)
6. A society (non-commercial) provided structured information service to let schools and teachers disseminate material to pupils and for pupils to submit their work. In addition a free form information service (rather like Facebook) to enable groups to be created and views expressed in an open manner. This would let all pupils across society who are studying say Grade 2 of subject x to exchange views irrespective of school and location.
7. Open School and Open College models should be provided to support pupils of all ages studying to achieve grades up to University standard. For example it could be an adjunct to the Open University model in order to minimise set-up and administrative costs, but would be free to society's citizens.

Basic Education Local Services

These services are expected to be delivered from a site within 3 miles of each pupil's home. Sensibly the site should provide pupils with all their basic education needs. (Thus this facility will include pre-school and primary school in today's model.)

The starting age will be the start of term after the pupil's third birthday. The educational philosophy should be based on Montessori techniques with the scope as defined by the Basic Syllabus as defined above.

On starting education, each child will be assessed in a structured but where possible non-intrusive manner to assess their instinctive behaviour, knowledge, peer bonding, and basic health levels. This information will be captured in a society provided centralised datastore as detailed above. [By carrying out these assessments termly and keeping the data in a national repository progress can be assessed either as the pupil progresses up the educational system or if the pupil moves school due to a change in parental circumstances (e.g. new job).] The results of the assessment will inform the modules which the child needs to work on first. Each child will be allocated a teacher to mentor them through the whole of their Basic Educational Phase.

All full time staff of the establishment will have benefited from appropriate training in the Montessori methodology. Whilst the Montessori does provide for some teacher talks to groups it is recommended that structured (chalk and talk) education should not commence until pupils have demonstrated

- the ability to remain focused for 30 minutes
- the ability to take notes on material being presented
- the confidence to ask meaningful questions in a group environment when there is a lack of understanding.

Parents, who are not at work, are expected to contribute as helpers on a (say 50%) part time basis. As helpers, they will be introduced to Montessori techniques and provided guidance on applying the techniques at home, taking advantage of the central services provided, so their children can progress in a sound manner (with this approach parents will unwittingly improve nurturing skills for any subsequent children). Each child will be assessed for progress against the Basic Education criteria at least once a term. Initially the assessments will be based on qualified staff observations although as children get older they will be introduced to computer based assessment tools. For example mental arithmetic testing will establish the size of numbers a child feels happy with in head processing (adding, multiplying or dividing) together with a speed measure for answering a fixed number of questions and an accuracy of response. [Health related measurements should be fed back to the NHS so that the individual's record can be maintained from birth.] An automated analysis tool should be monitoring progress against established statistics and raise an alarm if deviations exceed agreed limits. Again where behaviours are outside the norm then appropriate educational steps should be taken. By carrying out these assessments on a fixed time basis and keeping the data in a national repository, progress can be assessed either as the pupil progresses up the educational system or if the pupil moves school due to a change in parental circumstances (e.g. new job).]

Pupils, who are identified as struggling despite normal school support, will be assessed to establish if the cause is with the child or due to the nature of home support. For example where shortfalls in the nurture phase have been identified or the child is lacking in parental support for reading or writing then extra support should be provided to those pupils. This could be provided by older peers or on a charitable basis. In either case an external specialist will be invited to lead on the appropriate remedial action as defined in Pragmatic Perfect Delivery of Social Services.

In order to have passed the Basic Educational Phase each pupil must have reached Grade 10 in each of the group headings provided in the basic syllabus. On reaching Grade 10 in a subject area, each pupil will be able to select which element of that subject area they wish to study in more detail. The idea being that society encourages pupils to build on their strengths. The scope of material to be studied must, in addition to academic subjects, include at least a physical activity (running, swimming, Pilates, dancing) and a hobby or interest in applied form. Progress in all subjects above should be formally assessed on a grading basis and the outcome would be pass or fail. In all cases testing would be computer based, although marking of some subjects would be manual until such time as AI tools have reached an adequate level. Each establishment would two variants of the courses for each learning module, one targetted at the faster 40%(ish) and the other running at a slower pace. [This reduces the pressure on children especially as the opportunity to take modules tests could occur monthly. A key benefit is that the criteria for achieving a grade is identical nationwide and potential employers are able map the grading levels to the standards that have been identified for their job vacancies].

It is suggested that unstructured breaks be replaced by activity and hobby periods. This will result in pupils being grouped on a mutual interest basis and hopefully build relationships which will continue outside of schooling.

Pupils having achieved adequate grades in basic education will then proceed with conventional academic subject education in subjects of their choosing albeit GCSE and A level exams will be replaced with grading assessment.
The Careers service should become part of the education environment. Children on reaching the appropriate level on understanding society should be having a lesson a week on the careers available and the characteristics of each career. For each type of job available employers should detail the grade and skill levels required together with an agreed set of other attributes (e.g. customer facing, fitness /strength levels, self motivated, ability to work outdoors) for the vacancy. Concurrently there should be a formal set of sessions whereby pupils get to know their own characteristics in as an objective manner as possible and the typical short and long term salary levels for each career. Each pupil should have a careers officer allocated to them at the start of their education at secondary school. The officer will assist them in the production of their CV and be available to support them during their initial years in jobs. The careers officers will also provide the link between industry and the schools. To enable this model to work all employers need to notify the careers organisation of vacancies using job descriptions derived from the UK published templates.

To better understand society, all pupils should spend at least 2 months working for a charity, supporting either the elderly, disadvantaged, or a nature related charity (cleaning beaches or working with animals, assisting younger children with reading/writing) so that there is a real understanding of how society is there to support those in need of help.

Local societies should be funded to present the nature of their activities to all pupils as part of a 'soft sell' with the aim of getting as many as possible attending a starter session. Typical societies include music, sport, theatre/ dance, scouts/ guides, nature, outdoor activities, etc.

Establishment reporting. At the end of every term each school should make public

- Number of pupils who have dropped out since last report. [All drop outs should be picked up by Society's Safety Net (see separate paper)]
- The number of children starting jobs [These are pupils who have completed an initial year's apprenticeship and gone into a full time job. Pupils who have not got a job after apprenticeship would again be picked up by the safety net to address issues arising from their education]
- Number of pupils going into apprenticeships/vocational training.
- Number of pupils continuing in academic education.
- Report on number of parent and child issues
- % parents attending P/Teachers evenings (an indicator of level of parental support)

Other concepts of reporting are proposed in OECD A Framework for the Analysis of Student Well-Being (http://dx.doi.org/10.1787/19939019)).

In a similar vein it is important that the recipients of the service have to provide feedback on their take of the quality of the service. However some data may be personal and so not all will go into the public domain. So each child on leaving the each phase of the educational system will be asked to complete a form to establish

- Three teachers they respected
- Teachers who were considered weak
- Good points of schooling
- Weak points
- Number of friends formed (unnamed)

For Basic education, the role of teachers is to facilitate learning and thus there is no requirement for any high level academic qualification. It is proposed that the teacher selection criteria should as follows.

- Ability to earn respect from children
- empathy with children
- stimulation of dialogue with children and between children
- managing group situation so all group members have equal and fair input

Academic Education Next Phase.
This should be seen as a seamless continuation of the educational model already established. Pupils will continue to study discrete grades in each subject area. As they progress they will be able to select more specialist areas requiring improved understanding and analysis. Fundamentally the material will be similar to that taught today except there needs to be increased focus on application aspects rather than learning for the sake of learning.
Teaching would be similar to current practice although staff would be able to refer to the centralised computer based lessons to augment their material. It is expected that pupils would be encouraged to self learn some material and the time thus released used for group tutorial workshops. Where pupils are seen to struggle to progress on improving grades then discussions should be held about moving away from either the subject branch or if all are exhausted then away from further academic eduction. At this point pupils would focus on identifying potential job interests and moving to

vocational training. On reaching the required set of grades pupils would either start an apprenticeship, start a vocational course or process to university. All pupils must have a vision of the type of job they are interested in prior to leaving the primary phase of academic education.
Vocational Training
All Vocational Training Establishments (VTEs- polytechnics) need to ensure the training they provide is fit for the intended careers by ensuring each and every course is associated with one or more relevant companies. Industry approved courses should be run which are acceptable to the appropriate Guild and the Guild should validate the acceptability of any exams and skills assessment prior to certificates of achievement are issued. A report on the student's time in industry by the industry will form part of the national record for the student. VTEs must report on placement success rate. Society should provide polytechnics both locally to pupils homes and also enable pupils to move away from home. In other words there should be no difference between universities and VTEs in the environments available. The only difference is the duration of the course and the very close relationship with industry (preferably local).
As with basic education, the purpose of teachers is to facilitate learning rather than teach. In this case the teacher must have passed the qualification that they are teaching and meet the criteria given for the Basic level.

University Education.
University courses must prepare students for jobs which will provide a salary that makes the investment worthwhile. Each year universities should publish a report into percentage of students obtaining full time employment in a relevant job together with max min and mean salaries for those students. Marketing material to include average student salary of last 5 years for each course marketed together with percentage of students not reporting as being employed in a course related job.
A British university degree should not be recognised unless the student has successfully spent a year with a company undertaking work relevant to the degree. (As with all industrial time this will result in a written record being appended to the students national record)
University responsibilities should now include actively providing support in getting its graduates full time employment.
Universities should reduce the amount of time spent lecturing to students. They should be stimulated to producing quality online learning material as not all research staff are good at the production of this material. Universities should increase group discussions to stimulate proactive understanding and ability to reason through their positions. This should result in students with improved lateral and innovative thinking.

Conclusions

This paper has outlined a pragmatic affordable educational framework which is logically defined and informed by current practice. The framework specifically

- provides a clear unambiguous purpose for society education
- provides criteria that enables the success of the framework to be objectively monitored.
- has a syllabus suitable for both immigrants and established citizens of society.
- provides a clear educational and training route for both less academically able, as well as those academically focused citizens.
- allows pupils to proceed as a pace suitable to them rather than one size fit all
- should result in happier pupils due to the adoption of learning through play methodology in the early years and incremental grading
- seamlessly takes pupils though the educational phase into employment.

- by virtue of adjusting the syllabus and including apprenticeships within the education system should better align education with the needs of industry.
- gives all pupils access to a mentor for support in their careers following the educational process
- provides for the introduction of free computer based learning and examining system for all members of society.
- reduces the administrative load on teachers
- achieves the above with a reduced cost as result of providing education through the use of computer technology and changing the role of teachers to facilitators.

It is inevitable that as understanding of human nature evolves, this framework itself will need updating, but it provides an initial attempt at providing a cohesive model for the benefit of society. To avoid emotional reactions, the funding models and the nature of education staff training and qualifications is not included.

A side benefit is that separate computer based instances could cost effectively be stood up in different languages to enable anyone in the world with network access to benefit from a standard education on a charitable basis.

There are three use cases which fall outside of the standard framework and these will be addressed in the paper on Pragmatically Perfect Provision of Special Needs. These cases are

- Situation where parental support does not meet a minimum basic level.
- Situation where for physical, mental or behavioural reasons the pupil is unable to progress or proactively causes issues for other pupils.
- Situation where home life demands place undue demands on a pupil

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