

**Dr. C. W. W. Kannangara
Memorial Lecture**

29



Equality versus Equity

Dr. Sunethra Karunaratne

The first professor in science education in Sri Lanka

15th October 2018



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**Department of Research and Development
National Institute of Education
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www.nie.lk**

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First Edition - 2018

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**Printed by : Press
National Institute of Education
Maharagama
Sri Lanka
www.nie.lk
Tel: 011 7601601**

Equality versus Equity

On visiting this site of the National Institute of Education for this lecture, I reminisced the day I assumed duties under its first Director General Mr. D. A. Perera. After coming here as a Chief Project Officer, I had to work under the then Director of the Research Division, Dr. G. B. Gunawardena. It was required to continue annually as a series the Kannangara Memorial Lecture initiated as a concept by him. This onerous task assigned to Ms. Amara Peeris was implemented successfully by her with all her might and main until her retirement. I am also grateful to the present Director General of the Institute, Dr. T. A. R. J. Gunasekara for inviting me to deliver this lecture.

The commemoration lecture we are holding today is about Dr. Christopher William Wijekoon Kannangara eulogized as the father of free education. He was born on 13th October 1884 in the village of Randonbe in the Balapitiya area of the Southern Province. He started his schooling at the Wesleyan Missionary School in Randonbe. The Chief Guest who came to this school for the prize giving was Rev J. H. Darrel who was the principal of Richmond College, Galle. Having seen the heap of prizes Kannangara had won, Rev. Darrel had said that this pupil would need a bullock cart to carry the stock home. On the advice of Rev. Darrel, Kannangara appeared for a scholarship examination seeking admission to Richmond College. In addition to free tuition, Kannangara was offered free board and lodging at Richmond College, one of the prestigious schools on the grounds of his exceptional ability in mathematics shown at the examination. This kind of schools located close to the city was limited to the children of rich and educated parents. In those schools, the position of Principal was

mostly held by a Christian graduated in from Oxbridge Universities (De Silva, 1969). Those days, the schools were classified into two categories – the English Schools and the Vernacular Schools. Pirivenas also belonged to the Vernacular category.



Figure 1. The facade of Richmond College

Student Kannagara's talents were not limited only to mathematics. He captained the school cricket team, represented the school football team and the debating team and also displayed skills in drama and theatre. A problem that frequently worried this student who plenteously participated in school activities was the starkly contrasting lack of facilities for the students of the neighbouring schools. Those schools without permanent buildings had been cobbled together with wattle and daub walls and cadjan thatched roofs.



Figure 2. A school without facilities

The students who came to those schools didn't have a uniform unlike the Richmond children who were clad in a uniform of white shirt, blue short trousers, white socks and black, laced shoes. Most of the vernacular school children came barefoot to the school.



Figure 3. Richmond College students

Though each English School student learning in fully furnished classrooms had a desk and a chair, students and teachers in some vernacular schools didn't have a chair to sit on. During school hours, students learned sitting on a tarpaulin sheet laid on the floor. Playgrounds were not available. All these were burning issues to student Kannangara.



Figure 4. Learning with facilities



Figure 5. Learning without facilities

As soon as Kannangara completed his school education with distinction, he was awarded the opportunity to serve his alma mater as a Teacher of Mathematics. Subsequent to that, he served as a teacher at Prince of Wales' College, Moratuwa and Wesley College, Colombo. During this period he studied law and after taking oaths as a proctor of the Supreme Court in 1910, he practiced in the courts of Galle.

After embarking on politics in colonial Ceylon, Kannangara was elected to the Legislative Council in 1924. With the grant of universal franchise to all the citizens by the British colonial rulers in 1931, Kannangara was elected to the State Council by the public in accordance with the Donoughmore Constitution. According to this Constitution, the Council's executive committees had seven Chairpersons. One of them was the Minister of Education. Dr. Kannangara was the first Minister of Education in Sri Lanka. In 1942, at the first convocation of the University of Ceylon, Kannangara was conferred an honorary doctorate by the vice chancellor of the university, Sir Ivor Jennings appreciating the services rendered by him for education. He also served as the Executive Chairman in Education from 1937 to 1946. In spite of some members elected

to the State Council opposing the educational reforms presented in 1944, they were passed amidst applause of the house. That day, M.S. Aney who had come as a representative of India to listen to the Free Education Bill walking to Dr. Kannangara stated that had he presented this Bill in India as an Indian, he would have been worshipped as a god. Giving the right of free education to all the children in Sri Lanka was implemented with effect from 01 October 1945.

Transformational changes in the field of education occurred during the period from 1937 to 1946 (Ministry of Education, 2007). They are;

- Free education from the kindergarten to university
- Medium of instruction is mother tongue in the primary stage
- Teaching English in every school from grade three
- A curriculum that develops child's Head, Heart and Hand (3Hs).

The Education Ordinance No. 31 of 1939 put forward by Dr. Kannangara in the past is still in force. Notwithstanding the minor changes attempted, no change in the Ordinance has taken place to date. In this lecture, I am presenting Dr. Kannangara's contribution to education to date under the themes equity and equality.

Different people have defined equality and equity in various ways. According to Jacob and Holsinger (2008, p.4), equality is 'the state of being equal in terms of quantity, rank, status, value or degree while equity is considered 'the social justice and

ramifications of education in relation to the fairness, justness and impartiality of its distribution at all levels or educational sub-sectors’.

Distribution of resources according to equality should be just and fair. In this, a common judgment is taken to distribute resources by sub-sectors. But, various opinions may emerge from society about such a judgment.

How Equality and Equity are Emphasized in the Sessional Paper XXIV, 1943

Sessional Paper XXIV, 1943 has emphasized facts on equity in education both specifically and as a whole. The way the concept of equality has been analysed with a broad vision in it has ideal characteristics which can be related to present day society. The third chapter of the Report of the Special Committee on Education (1943) states three specific aims of education.

1. Mental Development or Mental Discipline
2. Culture including Character
3. Efficiency

In the way these three specific aims have been analysed, it is clear that it has emphasized the concept of equality as well as the need to institute equity by paying balanced attention to the three aims. When discussing the mental development, it is important to consider how the ideas which the Sessional Report present, emerge as controversial issues relevant even to the current context.

In this connection we would draw attention to the evil effects of the concentration on examination subjects

at far too early an age. At the moment however, we are more concerned with the educational principles which apply to the whole mass of pupils at school. Experiment has long since demonstrated, what reason had previously suggested, that there must be manual as well as intellectual training. Concentration on academic subjects, especially at an early age, produces unbalanced and therefore only partially effective development (p.12, para 14).

Emphasis is here laid upon manual training - woodwork, metal-work, gardening, cooking and other forms of domestic sciences- because it is one of the means towards a balanced mental development (p.12, para15).

Next to the manual subjects, we stress particularly the various forms of art and music. They are important not only for their own sake but also because of their high cultural value. Above all, they provide media for self-expression... A music lesson that consists in the playing of a single 'piece' a thousand times in order to pass an examination is not a means of developing self-expression but a means of killing the desire for it (p. 12, para 16).

As per these extracts, it is important to analyse on the grounds of the present context, how the imbalance of the academically oriented current curriculum and the mechanical nature of the examination-centred training programmes hinder the balanced development of the pupil and identify solutions. The concept of equality emphasizes the acquisition of minimum standards.

The Millennium Development Goals (MDGs) that had been set out before 2015 such as giving primary education, secondary education or literacy for all are examples for them. However in achieving those targets, there is an unfairness in discriminating individuals or children as competent and incompetent. Measuring competence based only on the personal factor divides children into two categories, talented and dull. Besides it ignores the external factors such as the gender, ethnicity, wealth and the area of residence that affected the tagging of the child as competent and incompetent. Through the policy of the equity it is expected to study the capacity to reach educational goals along the external factors such as these and formulate educational policies accordingly. On this foundation, it is required to identify the ratios between the schools in Sri Lanka and the number of students seeking higher studies in them and the trends in those ratios occurred after independence and reanalyse them in relation to demographic patterns, districts of residence and socio-economic background. The future plans should be systematically laid out with a foresight on the direction the education should take by 2030 and 2050. How the district quota system, the policy of equity operating at present with regard to university entrance affected the students' progress after the decade 1970-1980 should be scientifically analysed and due changes in it should be recommended.

According to UNESCO-UIS 2018, measurements on the equity in education are five fold:

1. Meritocracy
2. Minimum standards
3. Impartiality
4. Equality of condition
5. Equality of redistribution

The Quality Input Project launched in Sri Lanka in 2000 for providing facilities to rural, poor schools with scant resources can be regarded as a policy formulated to promote equity in education. Though the term 'equity' hasn't been explicitly stated in the Report, it is rich in ideas about the steps that should be taken to institute equity in the field of education. Examples on the two concepts equality and equity are discussed in the sequel.

According to the facts stated in the second chapter 'democracy requires in the first place a minimum standard of education and, beyond that, equality of educational opportunity' (p.9, para 3). A strong statement set down in the Report is 'We would impose no limitation on educational developments that are consistent with the democratic way of life (p. 9, para 4). Hence, it has indirectly shown the need to implement the concept of equality as well as the concept of equity essential for a democratic society.

In quoting the figures which indicate our diversity, therefore, we do not wish to stress that the divisions are fundamental... When we emphasize the special needs of the Kandyans and Muslims our purpose is not to forward their interests as communities but to enable the members of those communities to share equally with others the facilities that the nation affords (p. 10, paras 6 and 7).

When analysed this statement in depth, it is seen that it includes implications for the necessity of the equity concept because it highlights the requirement that special attention should be paid to the groups with lesser abilities.

We refer to the communal problem not because we favour communalism, but because owing to

the accidents of history the members of certain communities as individuals have not been able to claim equality. Our essential aim is to secure a sentiment of national unity, and so long as members of particular communities labour under a sense of frustration and a sense of grievance neither they nor the rest of the population will be able to think in other than communal terms... Our effort should be to remove inequalities so that national unity may be developed still further (p. 10, para 7).

This quotation indicates an attempt taken at the time to remove inequalities. The concept of equity emergent from it is relevant to the post-independent Sri Lankan context. The problems cropped up in the past and at present with regard to the district quota system for university admissions is a strong piece of evidence for this. There is a need to review the damage caused to the policy of equality and how the concept of equity in education is distorted by continuing indefinitely without a proper investigation, a step that should have been taken temporarily until the district-wise disparities are removed and new policies are formulated.

‘The diversity of our cultures renders even more important, if this is possible, the fundamental democratic principle of toleration (p.10, para 8). This underscores the importance of acting with tolerance, a principle of democracy when making decisions relevant to equity (Tamil members of the Parliament who expressed their gratification to Dr. Premadasa Udagama for the benefit caused to Kilinochchi, Mannar and Mullaitivu districts because of the district quota system, not speaking about it in the public is an example for overlooking this principle).

As is stated in the second paragraph of Chapter I, in spite of the fact that the term equity is not directly stated in the questionnaire prepared to collect opinions from teachers' unions, school managers and the general public (p.149, appendix 1), it poses questions embodying concepts relating to it. Examples are:

- Should all schools be owned and controlled by the State? If not, what degree of control should be exercised by the State over non-Government schools? Should non-Government schools be aided from public funds? If so, to what extent?
- Should schools continue to be divided into English and Vernacular schools or should they be divided according to their curriculum and not according to their medium of instruction?
- Should primary schools be separate from post-primary schools? Should there be separate infant schools?
- Should there be one type of post-primary school with various sides, or should there be different types of post-primary schools?
- Are you in favour of post-primary education for all, or should post-primary education be restricted? If the latter, what should be the basis of restriction?

The questions asked by Kannangara those days are debated even today when proposing reforms in education. The questionnaire contains questions relevant to teachers as well.

- Should the salary of a teacher depend upon the type of school to which he is attached, the post which he holds in that school, and/or upon his qualification?

- Should teachers form an educational service with graded posts?

Though some of the arguable issues queried through these questions have been solved by now, factors impacting upon equality and equity in school education still remain. For instance, despite the acceptance of providing post-primary education to all as a policy, how it should be moulded conforming to students' competencies still remains a controversial problem. Although the teaching profession has been graded as a service, there is a need to solve current problems by analyzing in-depth how teaching profession shall be combined with the Educational Administrative Service as a service based on professionalism. For example, the current practice of recruiting university graduates as administrative officers on the simple criterion of the competitive examination and delegating them the supervision of teachers with 10-20 year experience in the teaching profession is contrary to the policy of equity.

From the principle that education should proceed from the known to the unknown, it follows that a school should emphasize the geographic and economic conditions of its neighbourhood. We should expect the emphasis to differ, for instance, in Colombo, in Jaffna, in a low-country village school, and in an estate school. It is not suggested that there should be any difference in the quality of the instruction; nor, indeed should there be much difference in the subjects; what should differ is the emphasis. For instance, one would not expect as great an emphasis upon gardening in an urban school as in a rural school. These differences are necessary for relating education to life (p. 14, para 22).

Equity and equality have been accentuated by this statement also. Thus, the policy related to education and curriculum especially at the primary stage should be given due concern. Discussions have been made on the education of the 'Rodyas' by the Sessional Paper III of 1905 and estate children by the Sessional Paper IV of 1905 (p. 17, para 33).

When dissecting the four main defects (paras 50-57) and eight other shortcomings (para 58) given in Chapter V also, it is clear that problems related to equality and equity have been analysed. The four main defects were:

1. Existence of two types of education according to the medium of instruction
2. Excessive uniformity in education
3. Absence of equality of opportunity for education
4. 'Compulsory education' is in substantial measure not compulsory

A concept germane to equality has been indicated as absence of equality of opportunity. All the other three have emphasized the importance of implementing facts and policies related to both equity and equality. 'Excessive uniformity' asserts that despite primary education should have considerable amount of uniformity, secondary education has to be diversified according to students' abilities, their inclinations and the country's needs.

Other drawbacks are:

1. The inadequacy, in many cases, of school grounds, buildings and equipment especially for practical work;
2. The domination of curricula by examinations;

3. The narrowness of curricula, especially in the secondary schools;
4. The unsuitable nature of external examinations;
5. The shortage (and often the poor quality) of books in Sinhalese and Tamil;
6. The lack of sufficient provision for the blind, deaf, dumb, epileptic, crippled, mentally deficient, and backward children;
7. The inadequate provision for adult education; and
8. The abnormal percentage of withdrawals of pupils at the end of the primary stage.

Many of these problems were due to the shortage of funds. So, when seeking solutions to subsidiary problems, there was the need to make policy decisions in accordance with the policy of equity. But, at present, notwithstanding the allocation of adequate funds for the field of education and distribution of them among the provinces according to equity and fiscal policies, there are defects in their usage so that the disparities among the schools are mitigated.

The following facts relating to equality have been set out under control of education in Chapter VI.

- Mere State control of education does not necessarily connote a State System, for even under a denominational system the State has to exercise over the schools a certain measure of control; for example, State control must ensure the maintenance of a minimum standard of educational efficiency (para 62).

Therefore, the State at present should have its control over the international schools in Sri Lanka to safeguard equity.

- By equality of opportunity is not meant the same opportunities for all children for obtaining the same education. It really means opportunities for obtaining an education for which a person is best suited (para 63).

On these grounds, it is required to match and diversify the current post-primary education in Sri Lanka with individual needs. The classroom learning teaching process too has to be adjusted in conformity with individual variations.

Almost all of us here have learnt in a traditional classroom. When discussing teaching-learning methodologies, I ask my students to draw a picture of a classroom. More than 90 per cent of them drew the traditional classroom familiar to them. When supervising students' lessons also, such are the classrooms that I come across.



Figure 6. A picture of a traditional classroom drawn by a teacher pupil



Figure 7. Teacher-centred classrooms

Despite the plethora of discussions we hold about student-centred and teacher-centred learning approaches at various seminars, lectures, workshops and courses in Sri Lanka, novice teachers passing out from training too resort to teacher-centred education and it is very seldom that a lesson tending towards the student-centred approach is seen. From this it is clear that a continuous assessment is essential not only for the students but also for the teachers. Teacher capacity can be developed by activity based workshops (Karunaratne, 2008). Many teachers opine that as in-service sessions also assume the lecture mode, no new ideas or experience can be drawn from them. Although one may object to what I say, here I am referring to what is commonly seen rather than the good practices of one or two. The more closer the teacher to the student, the more are the student's desire and interest for learning (Karunaratne et al., 2009 b).

One student is different from another. Their home environments, social environments, passions, interests and intelligence quotients are not identical. This is well spelt out by the theory of multiple intelligence expounded by Howard Gardner (1983).



Figure 8. Student-centred classrooms

The idea emphasized when presenting facts about grading, classifying and organizing schools in Chapter VII is:

...we wish to emphasize that no implication is intended that one type is superior to another. ... We would state unequivocally that we intend that all the three types shall be accorded parity of status in our scheme (p. 39, para 89).

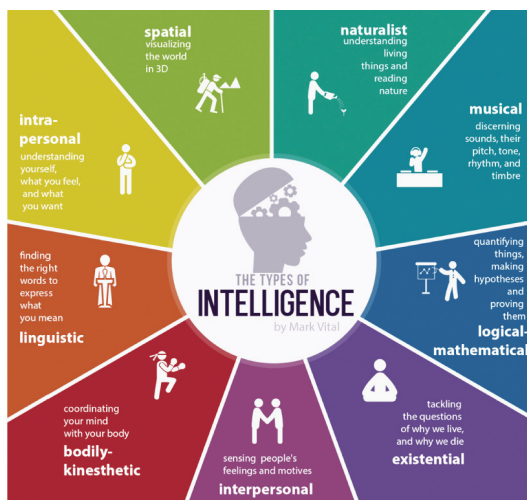


Figure 9. Howard Gardner's multiple intelligence

The classification often used today for schools comprises four school types:

- Type 1 AB - Schools with Advanced Level science stream
- Type 1C - Schools with Advanced Level arts and commerce streams
- Type 2 - Schools with classes up to Ordinary Level
- Type 3 - Schools with Grades 1-5

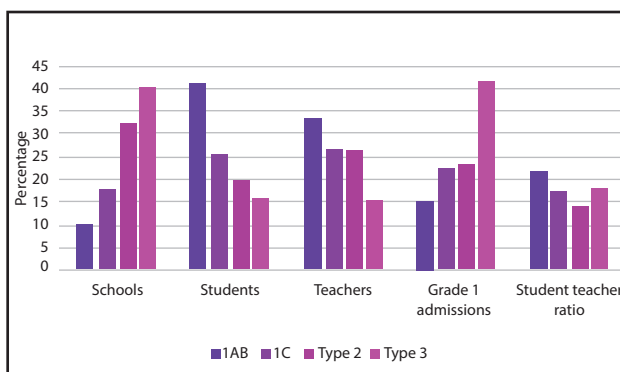


Figure 10. Percentage of schools, students, teachers, grade 1 admissions and student-teacher ratio by school type

Source: Annual Census Report – 2017, Policy Planning and Performance Review Division, MoE (2018)

Figure 10 illustrates the number of schools, number of students, number of teachers, grade 1 admissions and student-teacher ratios at the end of 2017 as percentages by school type. Most of the schools belong to type 3. Since these have classes up to grade 5, it is reasonable to find less number of teachers and students but it is deplorable not to see a dip in the student-teacher ratio.

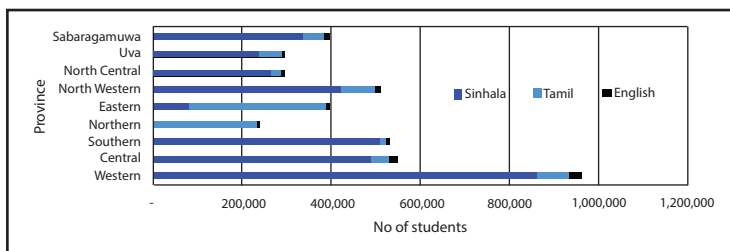


Figure 11. Number of students by provinces and medium of instruction

Source: Annual Census Report – 2017, Policy Planning and Performance Review Division, MoE (2018)

Comparison by provinces shows inequalities in the medium of instruction (Figure 11). The number of students learning in Sinhala and English media is very small in Northern and Eastern provinces. When analysed by school type, it can be seen that the number of schools with facilities to learn in all the three media is 558 (Table 1). Of them, 437 are 1 AB schools. Of 1AB schools, 801 are mixed schools while 92 are boys' schools and 136 are girls' schools.

Table 1. Distribution of schools by medium of instruction - 2017

Functional grade	Medium of Instruction						Sex of School			
	Sinhala medium only	Tamil medium only	Sinhala and Tamil medium	Sinhala and English medium	Tamil and English medium	Sinhala Tamil and English medium	Boys	Girls	Mixed	Total
1AB	296	114	9	437	142	31	92	136	801	1,029
1C	1,121	545	22	94	26	10	24	66	1,728	1,818
Type2	2,303	939	22	20	2	2	20	28	3,240	3,288
Type3	2,612	1,411	22	7	3	4	18	21	4,020	4,059
Total	6,332	3,009	75	558	173	47	154	251	9,789	10,194

Source: Annual Census Report – 2017, Policy Planning and Performance Review Division, MoE (2018)

Still there are problems with regard to the choice of the medium of instruction. Figure 11 displays selection of the medium of instruction by province and the number of students in the schools. In every province, only a very small number learn in English medium. It is quite clear that giving equal opportunities (equality) to all the 10 194 schools is difficult. But it is vital that inequalities are minimized and a policy of equity is followed for the betterment of students.

Central Schools

As a result of the thinking espoused from the school days either to bridge or narrow down the gap between the rich and the poor, Dr. Kannangara put forward the concept of Central Schools. This, I consider, is the concept of paramount importance set out in the Kannangara Special Education Report for introducing free education.

An education system with free education had been in existence in the Anuradhapura era. Those were native language schools. Since there was colonial rule from the sixteenth century on, these schools were undervalued. As all State affairs were done in English at that time, parents longed to educate their children in English. Further education should be done in English or some other Western language. Learning in English schools was limited to the children of rich, educated parents. When the country was ruled under the Donoughmore Constitution, Kannangara was the Minister of Education. He has expressed his opinions about this inequality as follows.

We insist also that one type of school should not be regarded as superior to another. Where a boy leaves school at the age of sixteen, an academic education

which fits him for a clerical post is of no greater merit or desirability than a technical education which fits him to become a mechanic, or an agricultural education which fits him for intelligent work on the farm (p. 15, para 24).

As a measure to extirpate the step-motherly treatment of the children learning in Vernacular Schools, a Central School was started in every electorate. This name was used not only in the geographical sense but also with the meaning that a variety of facilities for education is provided by the same school. It was a well-contemplated decision made by the Executive Committee; however weak an honest attempt made to free the education system from its academic orientation (p. 32, para 71). This is a policy of equity as it removes the barriers to achieve equality. A scholarship scheme was also started which opened the doors of the Central Schools at the centre for the bright students ending their primary education in neighbouring schools without facilities to continue their education. Forty students in primary schools around every Central School were given free board and lodging.

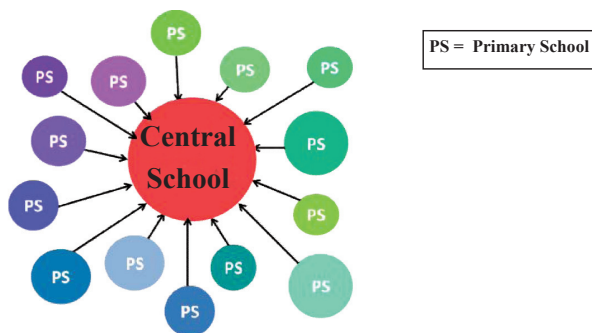


Figure 12. The concept of Central Schools

Grade five scholarship examination held today in our country has deviated from this noble idea. Now its major concern is giving an opportunity for grade five students to enter a popular school rather than providing further education to gifted students with economic difficulties. Hence, getting their children clear the hurdle of the scholarship examination by placing an unbearable load on grade five children has become an imperative of parents and teachers. Sumathipala (1968) states that Central Schools not only brought education to the village but also helped poor students move up the ladder of social mobility through the provision of board and lodging for them.

Mathugama school started in 1880 on a spectacular plot of land was named C.W.W. Kannangara Central College conforming to the Kannangara education policy. The post of the principal in this school was first held by Mr. G.D. Kulathunga.



Figure 13. C.W.W. Kannangara College - before and at present

Subsequently, the principal's post of the school was held by Mr. H.L. Wimalasooriya and Mr. J. E. Jayasooriya respectively. Afterwards, Mr. Jayasooriya rendered yeoman service to education as a professor in the University of Ceylon. He was the first speaker of the Kannangara Memorial Lecture Series initiated by the National Institute of Education.

The Central Schools started in 1941 increased in number to 54 by 1947. Bridging the gap between the English Schools and the Vernacular Schools, these schools used English as the medium of instruction. Dr. Kannangara wanted to found the Central Schools similar in model to that of the Royal College, Colombo. The model depicted in Figures 14 and 15 was the model of the Central Schools.



Figure 14. Walala Central College



Figure 15. Peradeniya Central College

Dr. Kannangara wanted to eliminate the blockades for realizing equality by providing all the privileges enjoyed by the children in celebrated schools to disadvantaged children. Therefore, special attention was paid to the quality of Central Schools. An officer was appointed to supervise teaching and learning in these schools. He, with the assistance of District School Inspectors, frequently inquired into the school organisation, the curriculum and the teaching and learning process. After June 1943, it was proposed to hold the Senior School Certificate Examination in place of London Matriculation and Cambridge Senior Examinations held till then. By 1946, 121 students had attended the Senior School Certificate Examination from 14 Central Schools. Of them, 61 passed the examination with nine securing distinctions for English Language. As far as the Central Schools are concerned, getting this type of a result is outstanding.

Special attention was paid to extra-curricular activities. Local dance, music and sports were added to the curriculum. Boys and girls of these schools participated in displays at Independence Day celebrations. Kuliypitiya Central College becoming first at an island-wide scouting competition is also a victory of Central Schools. At the Diyatalawa training camp, Central School cadet platoons won the first place several times. Realization of equality through the policy of equity applied to Central Schools sparked parents' zest. Many parents contributed to develop Central Schools donating money, material and labour (Silva, 1969). When Dr. S.F. de Silva, the Director of Education from 1957 to 1964 was investigating into the Central Schools, parents had said 'This is our children's school'. Mr. Rupasinghe who acted as a Director of Education in the decade of 1980 used this idea to develop schools under the project 'This is my child's school'.

University Education

Since Central Schools paved way for the tertiary education of rural, talented students, there was a rapid increase in the number of students entering universities. Even after giving free education, only about seven of those who had their education in English in English Schools and Central Schools got qualified for higher education and white collar jobs. In 1957, permission was given to sit the Senior School Certificate Examination in Sinhala and Tamil media as well. With the authorization to appear for the University Entrance Examination in Sinhala and Tamil media in 1959, universities too started to give their education in Sinhala and Tamil media in addition to English. Vidyodaya and Vidyalandkara Universities established in 1958 had their education mostly in swabasha.

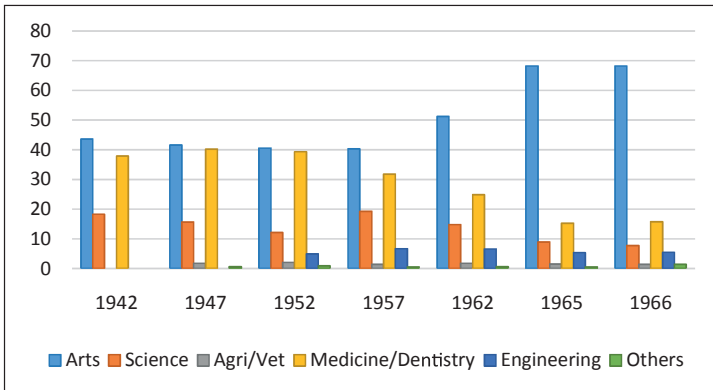


Figure 16. Growth of the number of faculties in universities from 1942 to 1966

Source: Malalasekara Centenary Volume (1969)

No policy was presented by Dr. Kannangara to the effect that teaching shouldn't be done in English language. He

appreciated learning English and proposed to teach English as a compulsory subject from grade 3. It is pathetic that some hold the misconception that Dr. Kannagara has said that English shouldn't be learnt. Because of the poor attention paid for learning English subsequently, employing competent teachers to teach English became difficult.

Initially, i.e. from 1942 to 1966, there were only arts, science, commerce, medical/dental and agriculture faculties in universities (Fig. 16).

Later, various subject streams were started. Alongside the increase in the number of universities, the number of faculties too increased. As per the data of the University Grants Commission, the number of students admitted to the universities increased by 2012/2013. Figure 17 shows that the number of faculties also was increased giving the students a wider choice of subjects.

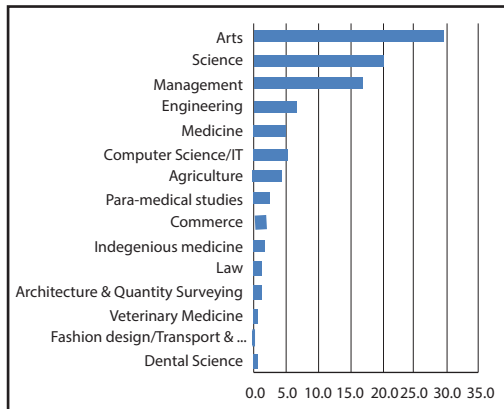


Figure17. Students admitted to the universities by subject

Figure 18 indicates the numbers graduated from the respective faculties by 2016 (Embuldeniya, 2016). It is seen that though a majority of graduates have been produced by the Arts Faculty (16,000), the number of graduates turned out by the other faculties is less than 50 per cent.

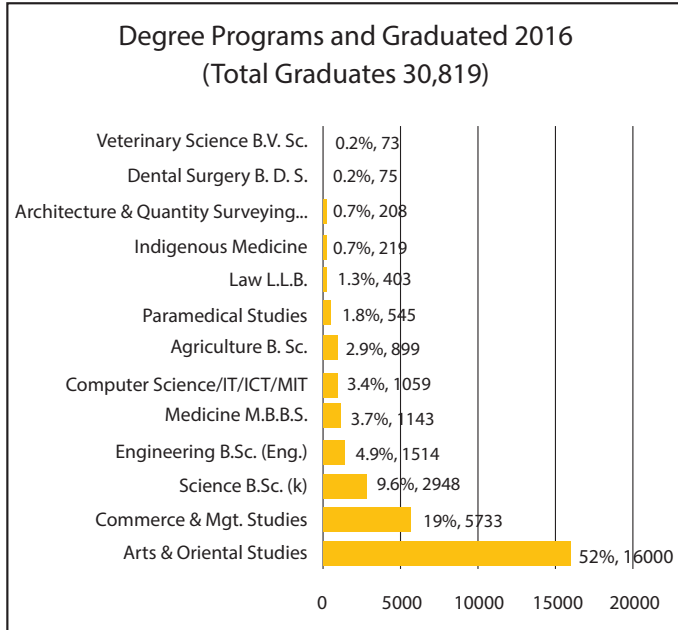


Figure18. Number graduated by courses

Even today, the acceptance and assessment of subjects has an impact on the selection of subjects. The fact that schools are distributed all over the island notwithstanding, only a few have Education Faculties or Departments which enable teachers to obtain Bachelor's, Master's or Doctoral degrees in education (IPS, 2017). Establishment of a Department or a Faculty of Education in every university is a great support for teachers who produce the future generation of the nation.

Women's Education

Under the title 'Girls' Education', paragraph 321 (p.iii) of the Kannangara Special Committee Report presents ideas about women's education. The Report has rigorously deliberated on the physical differences between boys and girls and the employment they can engage in, in the future. The aim of education is the mental development of a girl or a boy. Research hasn't found that a boy's mind is much different from that of a girl. What differ in them are the interests. That is also in accordance with the environments in which they grow. A boy may play with a doll or a girl may be attracted towards boxing according to the environment. Notwithstanding that the education received at the school sets a background for home experiences, girls receive a limited education at home.

The Committee Report states that every boy and girl should be developed physically and spiritually:

The society we have in mind is a democratic society in which all men are looked on as equal. Obviously, however, all men are not equal in all respects. They are not equal in regard to their capacities, physical, intellectual and moral. But they are equal in regard to what men have in common as being men, persons, moral beings. This equality matters so much that, compared with it, great and obvious differences between men are of relatively little importance. It is only in a democratic society that such equality is respected. In a democratic society the aim of education is accordingly to help every boy and girl to achieve the highest degree of physical, mental and moral development of which he or she as an individual is capable as well as to help them to be able and willing to work for common good (p.11, para 12).

This is a statement which underscores the importance of equality.

It is particularly important that girls should receive a good education because they will be the mothers of the next generation. It is also necessary to ensure that school influences that go to build character and develop culture should harmonize with the home influences (p. 13, para 19).

This statement is important in two ways. Firstly, the emphasis on girls' education can be considered an indication of the acceptance of the policy of equity. As a result of it, a considerable progress in girls' education can be seen in Sri Lanka today. As regards the university undergraduates' performance, more first and second class passes have been obtained by female students while more general passes have been secured by male students (Figure 19). Another fact emergent from this is that university courses are not implemented equitably for males and females.

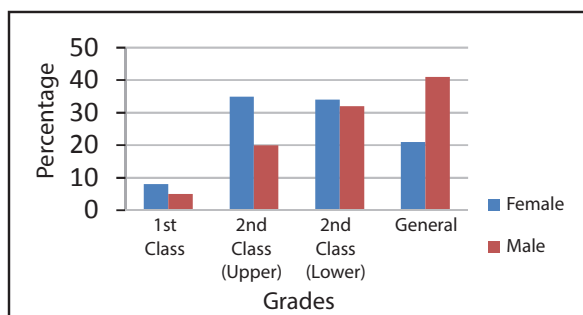


Figure 19. Percentages of male and female graduates by passes

Source: Ramanayaka et al. (2012)

Secondly, showing emphatically the relationship with home is extremely important from the point of view of the present context. On the basis of an injudicious attitude prevalent in the school culture, it is seen that children are excluded taking home environment as a negative factor affecting child's development. This is contrary to the principle of equity. A tendency of branding children attending small schools as 'left overs' is also seen. This has compelled parents to seek after urban schools and the parents who have become newly rich to incline towards English education in international schools. Hence, the above statement is important because it upholds equity and ideas have been expressed to the effect that in the future, policies should be formulated without causing repercussions on the principle of equity.

Let us start building a national system of education, which aims at realizing the destiny of this nation. Are we going to have a nation in this country or not? ...If we aim at that let us start with our schools; let us educate our people. If it is going to be a national education let it certainly be religious in spirit; let it be patriotic in tone. If it is going to be a national system of education, let it draw from the historic past and not from recent times. If it is going to be a system of national education, let it be based on principle of justice, equality and mutual service. If it is going to be a system of national education, let it be under national control. If it is going to be a system of national education, let it provide for all the children of the nation, let it be directed to their physical, moral and intellectual welfare (Hansard 1944, p. 946).

In the education system prevailed in the Anuradhapura era also, women didn't have any deterrent for education. It is said that boys had their education in monasteries and pirivenas while nunneries looked after the education of girls. Though they had their education separately, they sat together when listening to sermons showing that they were not discriminated against (Endagama, 1992). But, because of the English schools founded during colonial rule, there was a closure and undermining of vernacular schools. This affected women severely. At that time, schooling female population was very small and women's literacy was at a low ebb. In 1901, only 8.3 per cent of the women's population was literate. Dr. Kannangara who sustained that all people are equal strongly wanted to remove the inequalities that oppressed women. Dr. Kannangara has commented on the unfairness afforded to women in the following terms:

It is a well known fact that in this country women are treated as slaves or lifeless goods. In this democratic era we have to go ahead with time. Being on an equal standpoint and status, women can compete with men. A half of the humans shouldn't be kept in slavery under oppression. If they are humiliated in an unequal manner, what can be the quality of the products? Steps should be taken to treat everybody equally for the sake of the future generation (Hansard 1947, p. 4294).

Stromquist (2015) has stated that empowerment of women is important to eliminate inequalities while Gosh (2015) has revealed that women's literacy could be increased by using self-help groups.

UNESCO-UIS has designed an e-Atlas to show gender inequality. This describes the progress achieved by girls and women and the impediments for their education. In spite of the attempts and the progress occurred during the past two decades, more girls have dropped out from education than the boys. According to UNESCO-UIS data, about ten million girls in the 6-10 age group have never been to school. Nevertheless, almost all the girls having admission to school receive education even in the midst of the hardships. Sustainable Development Goal 4.5 targets eradication of disparities in the gender equality and provision of equal opportunities to have access to all levels in education.

With the implementation of Kannangara education policy, the women subject to suppression were relieved. In 1931, of the total number of students enrolled in schools, the percentage of girls was 36.4. Table 2 indicates how this increased gradually. The current status presents a different picture.

Table 2. Percentage of schooling girls by year

Year	1931	1947	1963	1970	1979	1983
Percentage of girls	36.4	43.0	46.0	48.0	49.3	49.7

With the advent of free education, the doors of education were opened not only for the rural children but also for all the girls. In the women’s year 1975, the inequality on women became visible.

Unemployment of women is twice the unemployment of men. In both local and foreign labour markets, women often get less paid jobs. Through a research conducted using 507 children (256 girls and 251 boys), Kersey et al. (2018) showed the notion

that when selecting employments, a difference between males and females emerges due to discriminations affecting them from the childhood is a misconception. Education system and the school exert a great influence to attract girls for various subjects. Therefore, women can be empowered by the provision of equal opportunities and a quality STEM education (UNESCO, 2017).

In Sri Lanka which produced the first woman prime minister in the world, gender inequalities can be seen even today (Jayawardena, 2015; Madurawala, 2015). Society even today accepts that maintaining peace at home and accomplishing everyday household chores successfully is an obligation of a woman and a mother. It is also important to identify that self is treated unfairly. Every year, American Association of University Women (AAUW) awards grants to female international students reading for post-graduate degrees in American universities based on academic excellence. On the occasion of the grants awarding ceremony held in Washington in 1990 for which I myself participated to receive the grant, I understood that I too have been denied the due privileges and posts in Sri Lanka for the sake of being a woman when I was listening to the life stories of other grantees. But, as a girl in Mahinda College, Galle which is a boys' school, I was not subject to any inequality. Providing equal opportunities to woman is a responsible task.

Science Education

A problem in the present context of Sri Lanka is the existence of a curriculum framework and an examination procedure that consider mathematics and science first and foremost. Nonetheless, from the way the subject content is sequenced under respective sections when presenting the educational substance in the Sessional Report, it is clear that it has inquired into the aims of education in a broad perspective.

- Personal and Public Health
- Manual Training
- Music and Art
- Language and Literature
- Mathematics
- Nature Studies and Natural Science
- History and Geography
- Citizenship

The Sessional Report states that the curriculum is not knowledge-centred but should be developed on activities and experiences. Further, it should not be examination-centred (p. 47, para 143). These activities should be designed so that students' experiences are manifested falling in with respective contexts, so it also conforms to the policy of equity.

After gaining independence in 1948, various changes have been made in the Sri Lankan education system. Studies conducted by various institutions have stressed the necessity of scientific and technological skills for the agricultural and industrial development of Sri Lanka (Wanasinghe, 1981). Thus the necessity of developing such skills not only by higher education but also by school education has been explained.

Science was taught in assisted schools in which the medium of instruction was English. At the time when I was in the Ordinary Level classes, all schools didn't have facilities to teach science. Moreover, in order to have qualifications to learn science at the Ordinary Level, in addition to the term tests, an year end examination was held after grade eight. I also got through such an examination held by the school and learnt science at the Ordinary

Level. Advanced Level science stream could be held only in a very limited number of schools. Most of the female students who learnt science in girls' schools went either to a boys' school or a Central School and learnt science further. This witnesses the inequality which barricaded girls' learning.

The policy decisions made by the Ministry of Education in 1956 led to the upliftment of science education subsequently. Those policy decisions were:

- Students aged 11-14 should be taught general science;
- The number of schools teaching science at the GCE Ordinary Level shall be increased;
- A scholarship scheme should be introduced to support the science education of students belonging to low income groups.

After receiving UNESCO aids as a result of a survey conducted by the World Bank for the development of science education from 1957, the Government appointed a committee under the chairmanship of Mr. B.J.P. Alles. As W.R. Clerk has stated, two main factors have been taken into consideration for developing science education with a broader aim of laying a strong and more effective technological foundation for society.

1. The teacher should have at least knowledge, understanding and feeling about the broad aims of teaching science.
2. The examination should give a motivation for a correct methodology of teaching science.

Under this project, it was decided to teach general science in grades 6, 7 and 8, physics, chemistry and biology in grades 9,

10 and 11 and physics, chemistry, botany and zoology in grades 12 and 13 (Advanced Level). So, appropriate instructional methods and examinations for it had to be planned. Traditional methods of testing science learning needed to be changed. By implementing school-based assessment properly, students' weaknesses can be remedied in situ turning them into strengths (Sedere et al., 2014; Karunaratne, 2012).

With the distribution of resources for school laboratories in the decade of 1950 under the direction of Mr. Alles, science education was formally started in Sri Lanka. Steps were taken to construct 'double unit laboratories' in 158 schools and 'single unit laboratories' in another 158 schools. In 1972 a large scale education reform was launched. This brought about a drastic change in science education. Its motto was 'giving science education for all'. Today every student in grades 6-11 learns science. This is a reason for delight as well as an approach towards equality. The move expected to give experiences to the future generation to face day-to-day challenges successfully. Accordingly, integrated science was introduced to junior secondary grades. By this time there were regional disparities as regards the facilities for science education and the students who pursue higher studies in arts and commerce as well as the majority that denied the opportunity of higher education didn't receive science education relevant to their day-to-day life. Science education received by a limited sector was of highly academic character and contributed very little for skill and attitude development. Therefore, the science curriculum was again revised. In consequence, action was taken to develop measuring and observation skills under an integrated curriculum at the primary grades, teach integrated science at the junior

secondary grades and teach physics, chemistry and biology at the senior secondary grades. This new curriculum was implemented year-by-year gradually upwards from 1972.

As Ranaweera (1976) recounts, this new curriculum endorsed integration and was planned to give experiences for everyday life by connecting with the environment. At this time, nearly 600 schools had laboratory facilities and about 5 000 more schools had to be provided with such facilities. In the years 1971 and 1972, 3 766 schools had been provided with the minimal equipment kits whereas no equipment at all had been supplied to about 1 500 schools. This shows the inequality in science education prevailed at that time. Free distribution of textbooks to school students from 1985 too was a support for science education. This is a policy of equality.

In the first part of the decade 90-99, attempt was made to make a change in the approach of teaching science. Thus, the classroom teaching learning process bent from the traditional teacher-centred mode to pupil-centred mode (Perera, 2010). After identifying the need to widen science education, in 2003, the National Education Commission recommended to start science and mathematics subject streams in all the schools which had Advanced Level classes. However, only 262 schools could start Advanced Level science subjects during the period 2003-2013. Schools with the Advanced Level science stream are not equally distributed throughout the island. Most of them are located in urban areas. Of them too 1/5 is in the Western Province. As at 2018, only 1 017 schools have Advanced Level science stream out of 10 194 schools. The number of arts students is twice the number of science students.

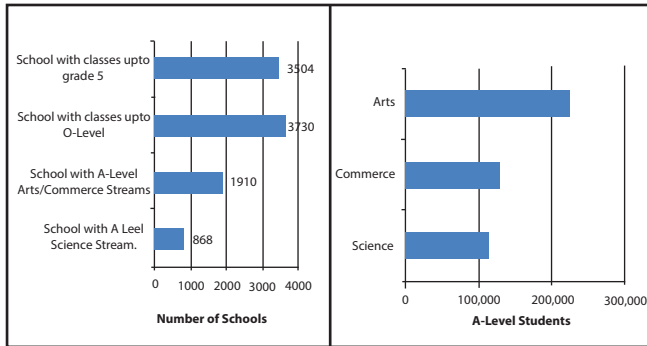


Figure 20. Opportunities for GCE (A-L) science education and number of students

Source: Jayawardena (2015)

Teaching the recently started technology stream is also subject to debatable problems. Figure 21 illustrates the disparity of human and physical resources in the districts of Sri Lanka when receiving quality education. Technology laboratories and Information Technology teachers have not been deployed proportionately.

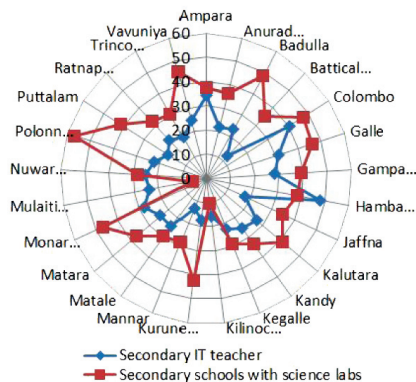


Figure 21. Availability of science laboratories and IT teachers in secondary schools

Source: Madurawela (2015)

There is a disparity in the provision of computers also. Nearly 70 per cent of the schools in the Western Province have computer facilities. But computer facilities are available only in about 50 per cent of the schools in Uva, Eastern and North-central provinces. It is the responsibility of the Government to lessen this difference.

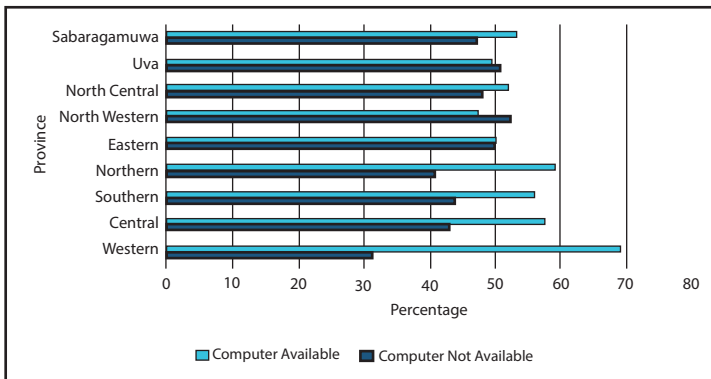


Figure 22. Percentage of schools with and without computer facilities
 Source: Annual Census Report – 2017, Policy Planning and Performance Review Division, MoE (2018)

Despite the host of reforms and changes carried into effect, teaching and learning and evaluation of science and mathematics are not done using modern methods of learning and evaluation. In order to realize the Sustainable Development Goals in 2030, the teaching and learning of present day students should be done setting sights on 21st century skills. Most of the students learning science and mathematics say that science and mathematics are difficult subjects because learning their concepts is not related to the day-to-day life. Students can assimilate fuller and meaningful learning by knowing how the things he/she learns are related to life. By allowing students to solve challenging problems, creative

ability and logical thinking can be developed (Karunaratne, et al., 2009 a). These abilities grow further by solving the problems in groups (Karunaratne, et al., 2009 b).

Many countries in the world adopt STEM education for learning science. Here, science, technology, engineering and mathematics are made to learn in integration strengthening the concept development in students. From this, a meaningful learning can be gained (Figure 23). As this integration encompasses school, community, country and the global village, the student can lead a successful life in the future upsurging his/her talents.

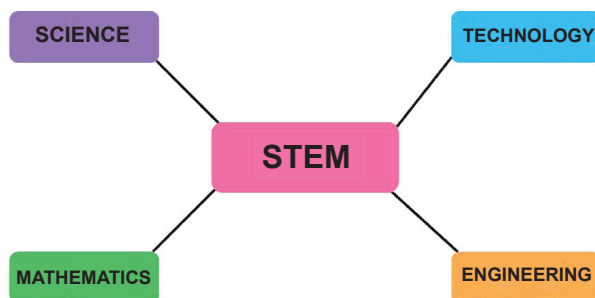


Figure 23. Subjects connected with the STEM concept

What is more important is the development of the four skills (4 Cs) – Critical thinking, Communication skills, Collaborative skills and Creativity during this process. An individual receiving STEM education not only becomes creative but also becomes knowledgeable about all the subjects in common. Thus he is employable in various occupations.

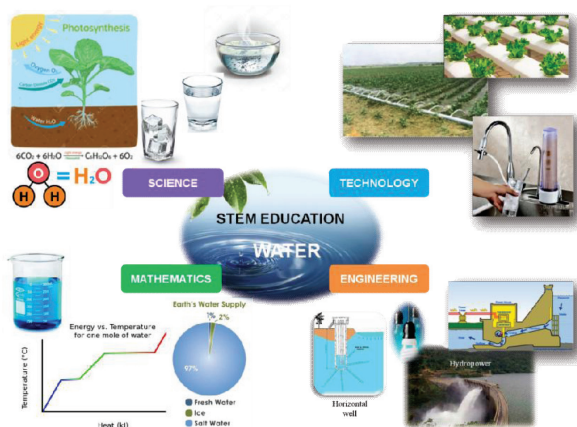


Figure 24. Learning the concept of water through STEM education

Figure 24 illustrates how the concept water can be taught more productively by integrating with science, technology, engineering and mathematics without limiting to learning its physical and chemical properties. Moreover, without limiting STEM education to four subjects, a more meaningful learning about water can be brought about by adding dance, singing and arts to it. Therefore, some call STEM education 'STEAM'. By receiving STEM education, one develops science literacy and ability to solve problems and make decisions facing challenges, so living with an understanding about the world becomes a habit.

Sustainable Development

With the culmination of the Millennium Development Goals (MDGs) introduced by the UNESCO in 2015, Sustainable Development Goals (SDGs) were brought into being. Of the 17 SDGs the fourth emphasizes the delivery of quality education.

Equity is a concept which remains as the core of SDGs. SDG 4.5 aims the eradication of gender inequalities and provision of equal opportunities to have access to all the levels of education. In the meantime, vocational education needs to be underscored for the vulnerable children and for those who have become vulnerable due to disabilities or being aboriginal (e.g. veddhas in Sri Lanka).

The concept equality has also been analysed on the basis of the concept Inclusion. In line with the global trends, there are instances where the local and global data frames do not subsume the marginalized groups. The marginalized groups include disabled adults, the displaced due to conflicts, soldiers, child labourers and nomadic people. Despite the fact that problems related to gender equality have been solved in the Sri Lankan context (except in some Islamic groups), formal statistics on the common disabled population as well as the soldiers disabled by the war protracted for thirty long years, Tamil children who were conscripted as child soldiers, children fallen prey to political deception and children belonging to the groups such as gypsies have not been compiled from the viewpoint of education and for the aim of identifying the steps to be taken to establish educational equity (Karunaratne, 2014). Therefore conforming to the example set by the UNESCO Institute of Statistics (UIS) started to support the achievement of Sustainable Development Goals by 2030, Sri Lanka also should collect the population data relevant to sustainable development and educational equity. It also should use them to implement the educational policy and decide on relevant alternate policies. The objectives of the UIS are also important in the context of Sri Lanka. It is essential that the Ministry of Education and the National Institute of Education align their action according to them. Some of them are:

- Preparing guidelines on how the equity of each individual is ensured throughout his/her life
- Conducting research to design a comprehensive framework appropriate for measuring equity in education
- Disseminating relevant data which are locally and internationally strong to initiate research and policies

SDG 4.7 aspires to impart to every child, knowledge and skills essential for achieving a sustainable development. A sustainable development upholds sustainable pattern of living, gender equality, human rights, peace and a culture without conflicts, global citizenship and cultural diversity.

In a research study conducted by Mahathma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP), data were collected on education policy, national curriculum framework and subjects in relation to 14 categories. Figure 25 shows categories reflected by education policy (For this, educational reforms in 1997 and new educational reforms in 2013 were considered).

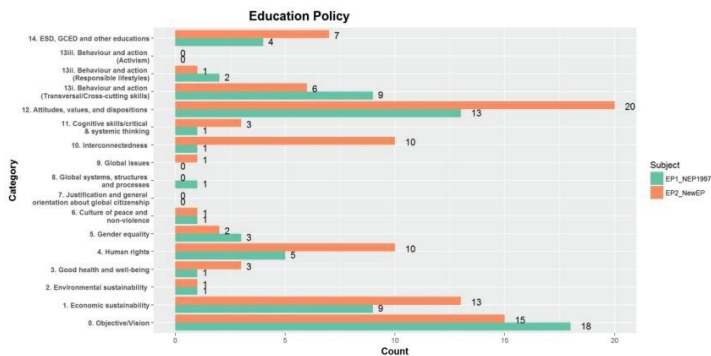


Figure 25. Categories reflected by national education policy

However, when the national curriculum framework is considered only seven categories are represented (Figure 26).

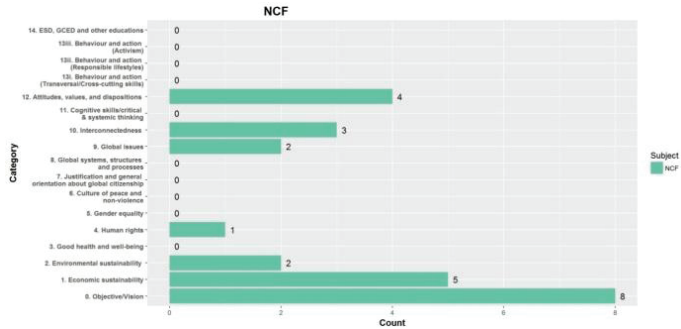


Figure 26. Categories reflected by the national curriculum framework

Figure 27 depicts the compilation of data collected on national education policy, national curriculum framework and subjects under three major dimensions - Economic, Environmental and Social development.

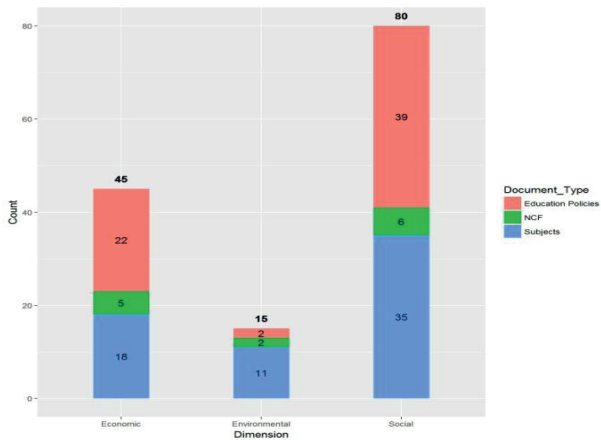


Figure 27. Inclusion of education policy, national curriculum framework and subjects in three major dimensions

The study reveals that a greater attention has been focused on the social dimension (Figure 27). Under that dimension too, national curriculum framework has been given less concern compared to education policy and subjects. This is seen under the economic and environmental dimensions also. In curricula and textbooks in Sri Lanka only very little has been mentioned about education and global citizenship for sustainable development (Karunaratne, 2017). This implies that the national curriculum framework should be strengthened. Though education policy includes many out of the 14 categories (Figure 25), it is required to investigate reasons why all those categories are not represented in the national curriculum framework and subjects. It is a difficult task to achieve SDGs without a holistic development in education policy as well as in the national curriculum framework and subject content. Through the analysis of data in the said study, many findings surfaced. One main finding of it was that in these countries the curriculum gives less prominence to sustainable development and global citizenship (UNESCO – MGIEP).

Today, what our country needs is to have a sustainable development in the 21st century. When designing the curriculum, its expected learning outcomes should aim to mould an accomplished citizen who can serve the country and the world. Today many of the developed countries in the world customize their education systems conforming to the 21st century learning framework because of the use of developing skills in addition to gaining knowledge. Dr. Sedere clearly explained this at the Kannangara memorial lecture held in 2016. Reviewing Kannangara reforms, Prof. Carlo Fonseka (2009) and Dr. G.B. Gunawardena (2012) have declared that we have failed in implementing the reforms effectively. I also agree with this idea.

Once again I wish to express my thanks to Dr. (Mrs.) Jayanthi Gunasekara, the present Director general of the National Institute of Education for inviting me for this oration. I am very much thankful to Dr. Godwin Kodituwakku who served as a Director of the Research Division and an Assistant Director General of the Faculty of Research and Planning for providing necessary information for this lecture. My thanks are also due to the present Director of the Department of Research and Development, Dr. Dayananda Keppetigoda and staff, Senior Lecturer Ms. Shirani Pushpamala who coordinated this task and Mrs. Nilmini Fernando who typeset the manuscript of the lecture. I am also much thankful to Mr. M. A. P. Munasinghe, the former Chief Project Officer of the Department of Research and Development for translating into English the report prepared in Sinhala and Mr. P. S. Mohan of the Teachers' Service for translating it into Tamil. I am also grateful to Mr. W. M. U. Wijesooriya, Director (Acting) Printing and Publication and the typesetters Ms. K. Kandiah and Ms. A. D. Anusha Tharangani for their efforts in bringing this lecture in print form.

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About the Speaker

Having obtained the Bachelor's degree in Biology from Vidyalankara University, Sunethra Karunaratne started her career as an assistant teacher at Elpitiya Ananda Maha Vidyalaya and at her alma mater Mahinda College, Galle. She completed the Postgraduate Diploma in Education at University of Peradeniya with a Distinction Pass winning the Kahn Gold Medal for the best performance. Having pursued further education, she obtained MSc from the University of Peradeniya, MEd in Science Education from the University of Bristol and then PhD from Michigan State University, USA.

During her distinguished academic career she served several educational institutions which include Pattalagedera Teachers' College, Curriculum Development Centre, Research Division of the Ministry of Education, Research Division of the National Institute of Education and finally the Faculty of Science of University of Peradeniya where she was appointed full Professor in Science Education in 2009 becoming the first to hold the position. Her contribution to these institutions is monumental. At the NIE, Dr. Karunaratne's initiative of Grounded Theory-based Qualitative Research and her colloquium address on 'Social Constructivism' were well received. Being the first to be conferred a doctoral degree in Science Education she introduced undergraduate courses and post-graduate courses to the university system.

Prof. Karunaratne has communicated research findings at national and international forums. She has served as a consultant in the publication of science textbooks and has authored chapters of textbooks and publications. She has served as a member in several professional bodies of Sri Lanka and abroad and was a visiting

scholar for the Problem-based Learning Project in Michigan State University and University of Ipoh, Malaysia. Prof. Karunaratne was instrumental in forming the Indian Ocean Comparative Education Society (IOCES) the first convention of which was held in Sri Lanka by her as its president. She extended science education activities by serving as the Higher Education Link Coordinator between PGIS and Sheffield Hallam University. She also has shared her expertise as an examiner with Curtin University of Technology, Edith Cowen University and University of Sussex.

Prof. Karunaratne served as the national consultant for the UNESCO/MGIEP Project on 'The State of Education for Peace, Sustainable Development and Global Citizenship (EPSG)' and the UNESCO project 'Involvement of Sri Lanka in a Multi-country Mapping on Learning to Live Together' in Bangkok. She was invited by the Geneva Centre for Human Rights Advancement and Global Dialogue to make a presentation on 'Human Rights: Enhancing Equal Citizenship Rights in Education'. In appreciation of her service to the education system, World HRA Congress awarded 'Education Leadership Award' to her at the South Asian Partnership Summit and Business Awards in 2016. Although she is retired, she is serving as a consultant in many institutions. She is serving as a member of the planning committee of the South Asian Centre for Teacher Development and, also as an active member of the National Committee on Science, Technology, Engineering and Mathematics (STEM) Education in Sri Lanka.

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