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A Comparative Study on Math's Education Rendered in the Two Communities on the Island of Cyprus

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Abstract: The island of Cyprus embodies two distinct communities having their own systems of education. On the road to EU certain parallelisms need to be set as it is the goal of this study on math's education. This paper will concentrate on K_1-K_{12} math's education. The topics to be dealt with will cover math's curriculum at all levels; weekly distribution of math classes, as well as their proportion to the other courses offered. Students are expected to be more creative in class rather than resorting to rote learning even in math education. The study will also try to shed light on class size. Finally the math teachers and their educational background will be looked into so as to check into their prior math knowledge. The main goal is to bring about the similarities and differences and to come up with the standards of EU as well.

Key words: Mathematics Education, Two Communities, Turkish, Greek

INTRODUCTION

Math education, receives utmost attention in all educational programs. Had it not been for education at processes, individuals could not have acquired the ways, beliefs and standards of the society they live in. As individuals have to comply with norms, rules and demands of the society, they are a part of a special emphasis to math education as it is an indispensable part of everyday life; it is extensively used in science, commerce and industry. Math, to put it briefly, provides means to explain and predict.

It is commonly accepted fact that mathematical thinking is not much different than daily or scientific thinking. Math is communicated through language, and similarly thinking is communicated thought language so this analogy shows us that math is a way of thinking. Mathematics help people create and solve problems think objectively and independently, with self confident, that explains the relations. Thus these realities make math education highly important in all systems of education. Through common systems need to be brought to the agenda, and also, as the European Union is extending its borders as a national entity Cypriots derive to be part of this system, we need to reconsider what we are doing in terms of math education at schools and try to comply by the world as well as the EU standards. With all these thought in mind, my colleague Dr. Mehmet Caglar from Limassol and now in Famagusta at Eastern Mediteranean University in «North» Cyprus and I Chrysoula Hadjichristou from Famagusta and now in Limassol in «South» Cyprus decided to carry research math education in the two communities to point out the similarities an differences and to what extent the programs offered were close to EU standards. In this point we mainly focus on statistical data on schools of all levels, math educators and their statistical distribution to schools and math curriculum applied at elementary and secondary schools.

The Educational International Publication Barometer 2001 on Human and Trade Union Rights in the Education Sector, a journal which focuses on four fundamental human rights, states that separate educational systems are maintained by the Turkish speaking and Greek speaking communities on the island. In both communities primary education is free and compulsory as of age five. Boys and girls enjoy the same opportunities; and academic freedom is respected throughout the island.

The table 1 presents the actual figures as regards to population, literacy, and enrollment in schools, teacher's population as well as government allocations from the budget on education (G.N.P.- Government Net Proportion). The difference in the enrolment percentages depends on the fact that in Greek Cypriot Community (G.C) students have a choice of private enrollment as well. The hassle here is the illiteracy high percentage in Turkey Cypriot Community (T.C.) and the low percentage spent on education compared to the G.C., which is almost less than the half of the amount spent in the G.C.

Within this framework, this paper will examine math education in both communities in retrospect to the whole education system. One of the objectives of the Ministry of National Education and Culture of the T.C. is to educate all individuals scientifically with humanistic values for the end product of constructive, creative and productive citizens. Similarly, the main objective of the Ministry of National Education and Culture of the G.C. is to raise individuals who can meet the challenges of the century in the international context, which includes developments in science and technology, as is the goals of the T.C. in the «north» Cyprus.

Needless to say had it not been for the educators there would have been no math education at all let alone other forms of education. For the matter the role the

Table 1

	Turkish-Cypriot Community	Greek-Cypriot Community
Population<15 years of age	21.6%	24%
Illiteracy	10,2%	3,1%
Pre primary enrolment (kinder garden)	100%	60%
Primary enrolment (Elementary)	100%	96,5%
Secondary enrolment (High school)	100%	95%
Primary pupil teacher ratio	14%	15%
GNP spent on education	4,5%	10,6%

educators play in this system is undeniable and it is worth mentioning the number of schools, pupils and teachers as well as the pupils/teacher; teacher/school and pupil/school ratio at elementary schools as in neither of the communities mathematics educator is carried out by subject area teachers(Board of Education, 2000). In the G.C. (denoted by south while the Turkish denoted by north), the total number of elementary schools is 346; total number of pupils 61,042 and the total number of teachers is 3,630 (see table 2). The pupil/teacher ratio is 17, teacher/school ratio is 11, pupil/class ratio is 23,5 and pupil/school ratio is 176 (see table 3) for primary schools and similarly tables 4, 5 for secondary schools in both communities.

The primary schools system bears similar significance in the «north» as well. The total number of elementary school is 113, pupils is 19,055, teachers 1370 and classes 874 (see table 2). The ratio of these totals turn out to thus: pupil/teacher:14, teacher/school:12, pupil/school:169 and pupil/class :21.8(see table 3).

Upon examining two communities the case of the secondary schools we conclude the following about school demographics. The total number of secondary school students is 52,980 (gymnasium, lyceum, evening

Table 2: Primary Schools in numbers (ibid)

	Number of schools	Number of pupils	Number of teachers	Number of classes
«north T.C.»	113	19055	1370	874
«south S.C.»	346	61042	3630	2599

Table 3: Primary School in ratios

	Pupil /teacher	Teacher/school	Pupil/school	Pupil/class
«north T.C.»	14	12	169	21,8
«south T.C.»	17	11	176	23,5

Table 4: Secondary School in numbers[2]

	Number of schools	Number of pupils	Number of classes	Number of teachers	Number of math teachers
«north»	30	14431	505	1420	166
«south»	99	52980	1996	4695	549

Table 5: Secondary School in ratios

	Pupil /class	Pupil /school	Pupil /teacher	Pupil /math teacher	Class /math teacher	Class /teacher
«N»	28,5	481	10	87	3	0,4
«S»	26,5	535	11	97	3,6	0,4

	Teacher /class	Math teacher /class	Teacher /school	Math teacher /school	Teacher /Math teacher
«N»	2,81	0,3	47	5,5	8,55
«S»	2,35	0,3	47	5,5	8,55

students). Total number of classes is 1996, total number of teachers is 4695, total number of schools is 99 and total number of math teacher is 549. These figures produce the following statistics for the G.C.: student/class ratio is 26,5; pupil/ teacher is 11, pupil/math teacher ratio is 97, class/ math teacher ratio 3.6, teacher/ class ratio 2.35, teacher/school ratio is 47, math teacher/ school ratio is 5.5, teacher/math teacher ratio is 8.55 and pupil / school ratio is 535 (see table 4,5).

When we have a look at situation for the T.C. community, the total number of schools is 30, 166 math teachers and over a total is 1420. on the other hand, the total number of pupils is 14,431 and the total number of class is 331. These numbers yield the following ratios: pupil/teacher:10, pupil/math teacher: 87, class /math teacher: 2,81 teacher/ class: 47, math teacher/school: 5.5, teacher/math teacher:8.55 and pupil/ school is 481 (see table 4,5).

The curricula of math in both communities

Elementary school, taken the heavy burden as well as the responsibility of raising the pupils according to the demands of the next phase of the education system. When we look into the elementary school programs offered by G.C., we come with the following figures reports. In Grade 1 and 2 the total number of teaching hours is 31, in grade 3 the total number of teaching hours is 34, in grade 4,5,6, the total number of teaching hours is 35. The number of math hours is 5 in the first two years and 6 hours during the remaining 4 years. Hence the percentages are: 16,1% in grades 1 and 2; 17,1% in grade 3; and 17,1 % in grade 4,5, and 6.

In the T.C. elementary education system, pupils go to school for five years instead of six in the G.C. Hence the curriculum is relatively different where

the math hours in the first 3 grades of T.C. is increased up to 25% compared to the 17% in G.C. In the first and second years, pupils have a total of 30 class hours, 8 of which is devoted solely to math education. Hence the percentage is 26,7%. The total number of contact hour's third graders is 33 while math is again 8 hours per week. This yields a percentage of 24,2%. However, in 4th and 5th grades, the total number of class hours is 33 and 6 hours of math every week. So the percentage is 18,2%.

In «north» Cyprus, the curriculum is centrally controlled and is geared to meet the demands of the pupils, as their main concern is higher education: whether they will pursue it in Turkey or in the U.S. or Britain. Thus, the exams they need to sit for differ and hence the total number of classes per week is 4 in all the three years comes to about 34, which means it comprises 12,5% of the entire weekly program.

The curriculum of the gymnasium, devotes again approximately 4 hours per week to math classes in both communities while the other subjects add up to 34- 35% (hence the percentage comes out to be 12,5-11.4%) in T.C and G.C. respectively, which means that there is no significant difference between them.

Upon looking at the Lyceum - Secondary high school curriculum in the T.C., we see that the number of math hours differ according to the section the pupils are in table 6. In the first year total number of math hours is 5, but in the second and third years, they are divided into three –field area: Science, Math and Arts streams (table 6). The number of math classes is seven per week in Math, 6 and 3 hours in Science Lyceum 2 and 3 respectively, while in Arts it is three hours in Lyceum 2 but there are no math lesson in lyceum three4. The percentage for the math classes would be 20% out of the 35% of the total classes. However when we have a look at science stream it is 17.1% in Lyceum 2 and 8.6% in Lyceum 3; but in art it is 8.6% in lyceum 2 and pupils do not have any math in their final year (see table 6).

In the G.C., a new type of comprehensive school was implemented as of the school year 2000-01, called Eniaio Lyceum, offers 4,3, and 2 hours of Math per week, in grades A, B, and C respectively in the Core

Table 6: Math hours in Secondary school

	A class	*B class*			*C class*			Total math hours in three classes in each area		
T. C.	5/35	Math	Science	Art	Math	Science	Art	Math	Science	Art
		7	6	3	7	3	0	19	14	08
G. C.	4/35	Core	Special	Enrichment	Core	Special	Enrichment	Core	Special	Enrichment
		3	7=4+3	9=7+2	2	6=4+2	8=6+2	9	17	21

Course. In grade A the total math hours is four over 35, while in grade B math hours can extended in 7 or 9 hours, which depends on the program (special or enrichment). Finally, in grades C the number of math hours, can also be extended in 6 or 8 hours (depending on special or enrichment program(Korkmaz, 1999, Akcal, 1993) (see table 6).

From the total math hours (table 6) we can assume that the math field comes up to 19 hours, (which is the total hours of the A´ class, B´ class and C´ class (5+7+7 hours) in Math field) in the Turkish curricula and that is the average of the two programs in Greek curricula that means again that there is no significant difference between the communities in the secondary school spent in math hours (Korkmaz, 1999, Akcal, 1993) .

When we look at the ratios between the two communities, it is possible to see that the figures are very close to one another. When we look at the programs and the curricular, we can assume that there are similarities in the ratio of math hours over other subjects. However, as the elementary school education is 6 years in the G.C., the number of math hours in the first three grades is more than in the T.C.

As education is the one main factor that reinforces social mobility in all communities and as math education plays the utmost role in raising pupils as learned individuals more and more emphasis should be paid to math curricula, math teacher education and trends in math education. It then becomes possible to say that education is a very dynamic process and as long as the world changes so would educational trends.

CONCLUSION AND RECOMMENDATIONS

When we consider math programs as a whole, we can see changes taking place from year to year, however, these changes are not very significant when we look at them at a yearly basis. When we consider the education system in both communities, there are differences in the elementary schools in terms of the duration of the education rendered at this level. In the G.C. elementary education goes six years while in the T.C. is five years. However, before 1985-86 school year, it was six years in the T.C. as well. However when we look at the tables we can see that there are similarities in the ratio of math hours over the other subjects. Also the topics of the curricula on both communities are according to the NCTM goals to achieve the math education. These goals refer especially in 10 topics of the elementary school–number operations, geometry, data analysis and probabilities, problem solving, measuring and proof, communication, connection and representation.

Upon looking into educational systems of the secondary schools, due to the different school systems, courses offered and especially the number of electives and courses, they are varied depending on the stream chosen by the pupils. However the total math hours in both communities are very close too.

An overall evaluation of the two educational systems with regards math education has been the main concern of the researches. We believe that, once scholars from both communities initiate such scientific studies jointly, they would help with the efforts in the road to piece. Once such undertakings are well underway, joint math meetings, math clubs, math operations could be arranged and these could lead to more extensive organizations where Turkish and Greek Cypriot could complete jointly or individually against their counterparts in math competitions with European countries. Joint publications would help bring the math scholars closer and bridge will be built between the educational systems.

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