

Report of the Co-Education Working Party

Submitted to HM Government of Gibraltar, 14 May 2017

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1 Terms of Reference

The working party was set up to make recommendations to Government vis-à-vis secondary education and whether a co-educational model is desirable. The brief was not to conduct a full public consultation exercise but rather to invite submissions from professionals who work in education, non-governmental organisations, youth groups, leaders from different religious faiths, charities, parent associations, teachers, and a sample of secondary school children and university students.

The working party would like to thank all those who submitted their carefully considered views on this important question (Appendix 1 contains details of the invitations sent out - not everyone responded); it would further like to thank members from the public who took the trouble to write to us despite not being asked to do so. We are also indebted to the associations, charities and clubs for assisting us in our task through the dissemination of information and the holding of meetings.

The working party considered these submissions and engaged in discussion and research (see Appendix 2 and Appendix 3). The report that follows, therefore, is the fruit of these considerations.

2 The Research

The single-gender schools versus mixed schools debate is a perennial one, charged with emotive arguments on both sides, making it very difficult to arrive at an objective decision. On a purely educational or pedagogic basis, and based on the search undertaken by the working group, there are no clear advantages or disadvantages demonstrated as to the superiority or inferiority of either single-gender or co-educational schooling systems.

Advocates of single-gender schooling sometimes refer to school league tables and examination results as evidence, arguing that single-gender schools consistently perform better academically, and that in particular all-girls' schools usually top the scales. It is further argued by some that single-gender education gives girls the very best preparation for the real world, and that it is well-known that girls learn differently from boys, preferring co-operative, discussion-based learning with set goals and supportive feedback.

Yet there are others who argue for a co-education model suggesting that girls are not in any way affected by the presence of boys, and, furthermore, that boys benefit academically from the presence of girls.

Furthermore, a common view expressed by some teachers and educators is that even if it could be conclusively proven that grades are slightly lower in a co-educational setting, this is a price worth paying in terms of other benefits. These might include increased confidence and social skills and being more at ease with each other; and, above all, the ability to see girls and boys as simply friends, not merely potential "dates".

Whilst raw statistical data may indeed support any of these claims, the research evidence we reviewed from around the world is somewhat more complex. The real difficulties arise from the fact that it is impossible to make a true like for like comparison between schools given that there are other considerable factors which affect performance. Schools differ in a host of ways: pupils' social background, the quality of the teaching, the academic history of students who enter the school, the school ethos, the way the school is managed and the calibre of the leadership, the size of the school and the number of children with special educational needs all play a significant part on the academic outcomes. Any attempt to compare schools that are completely the same in all regards is therefore an impossible task.

Given the understanding that on purely educational grounds, there is no clear evidence in favour or against establishing co-education, the issues must therefore be seen as a response to the change in social structures and values which society at large has undergone; there are clearly two main considerations, and not merely one, to pay attention to: firstly, the purely educational/pedagogic argument; and secondly, the broader questions of 'what kind of society' we want our schools to reflect so as to prepare our children to be the good and responsible citizens of tomorrow. Both necessarily must be firmly grounded in the context of Gibraltar.

3 Co-Education in Gibraltar

The working party received numerous responses for and against the establishment of co-education in Gibraltar. Some of the arguments are detailed below; these are not evidence based.

(i) **Pro Co-Education:**

- * (a) Given that children are co-educated until and including middle school, it would appear to make sense to continue with co-education into secondary school. The segregation of the sexes during the formative years is not natural and is itself a distraction, as manifested by the need for some to congregate outside schools of the opposite sex at the end of the school day.
- * (b) Making friends with the opposite gender, studying and learning next to each other and benefiting from different learning styles makes for a relaxed atmosphere; this is indeed an advantage as we prepare children for university or the workplace.
- * (c) Pupils may be socially disadvantaged in single-sex schools; co-educational schools reflect better the nature of society and enable pupils to foster friendships and relationships amongst boys and girls of the same age; this should help pupils to form more stable relationships in adult life.
- * (d) The Gibraltar College transitioned to co-education years ago with no detrimental effects; Years 12 and 13 currently operate practically on a mixed-gender basis; most of the education in Gibraltar is already co-educational. It therefore seems completely logical and sound to establish full coeducation.
- * (e) Under the present system, no choice is offered to students and parents in respect of which schools pupils attend; furthermore, the current system is relatively inflexible in respect of the subject choices offered to students; with the necessary flexibility factored in, some subjects could be taught in a co-educational environment, whilst single-sex groupings could be allowed whenever this is more appropriate.
- * (f) Second chance learning can be entertained if we have two co-educational schools. It then becomes possible to transfer students from one school to another if there are extenuating circumstances.
- * (g) If we handle the transition sensitively, fully aware of the pitfalls that need to be avoided, then we can make anything work and work well in our schools in Gibraltar. It would also mean that resources can be shared across both genders and if this leads to boys doing textiles and girls woodwork, and has no detrimental effect in the science/mathematics based subjects being taken up by girls, then co-education has the potential to bring about the most positive and beneficial change.
- * (h) In Gibraltar at secondary level the opportunity to mix with those of the opposite sex can be quite limited for those children with a disability; co-education would, therefore, allow the chance to learn how to interact with those of the opposite sex on a daily basis using examples and guidance from fellow pupils, something which is not always possible outside of a structured setting; this would hopefully lead to appropriate and easier interactions in social situations.

- * (i) Co-education prepares students for adult life; it promotes socialisation and mutual understanding, encourages tolerance, self-control and diversity; it provides more opportunities for academic and extra-curricular endeavours without gender stereotypes.
- * (j) No young person should receive less favourable treatment on the basis of gender; neither should he/she suffer disadvantage by reason of gender. People should always be treated equally and not put into separate boxes by their social class, their religion, or their sex.
- * (k) Learning to work with the diversity in society, particularly with the other gender, is extremely important and represents the only way of really solving problems of harassment, family violence, and misunderstanding between genders. In segregated environments, boys and girls look for differences between themselves, widening the gulf between the sexes. In non-segregated environments, young people work together and learn from each other, generating a climate of mutual trust and respect.
- * (l) Co-education throughout will present opportunities to develop mutual respect amongst both genders, allowing them to continue their personal and interpersonal development in a society where equal opportunities is now at the forefront of our core principles of good citizenship.
- * (m) Whereas there are always pros and cons to any given circumstance and notwithstanding the due ramifications that certain aspects of having a co-educational system throughout our schools may bring, the pros clearly outweigh the cons; our community should greatly benefit as we prepare children to be the citizens of tomorrow.

(ii) Against Co-Education:

- * (a) Research shows that girls do better in a single-gender setting, especially in the sciences; given that statistics in Britain show that the sciences make young people far more employable, it would seem logical and prudent to maintain the current setup.
- * (b) Co-education at the ages of about 11-16 puts young people together at the age when they are most self-conscious about their development and appearance. This is bad enough with those of the same sex, but becomes much worse in the presence of the opposite sex and is a huge distraction from their work and consequently from their opportunities in a later life.
- * (c) Boys and girls tend to develop at very different rates at that early-teens stage; there is often a ganging-up on one side or the other against self-conscious individuals, which can be extremely distressing as well as detrimental to progress.
- * (d) It is interesting to note that if girls are asked for their views on co-education in the presence of others (adults and/or young people) they say they agree with co-education; however, if no one is within earshot they confidently say they do not want co-education.

- * (e) A single co-education secondary school would host in excess of 2000 pupils and that size in Britain has been found to bring lots of problems relating to discipline and behaviour which are very difficult to manage.
- * (f) Two co-education secondary schools in Gibraltar would result in unhealthy competition between both, with parents looking anxiously at the other school and wondering if they should try to transfer their child to that school.
- * (g) The consortium style of recent years seems to have worked well to enable students to take subjects not available in their own school. All things considered, the system as it has evolved seems to be the most suitable for Gibraltar; it is the most practical for Gibraltar's children to have the best possible chances in education for their future.
- * (h) The single sex secondary system has worked well, and any change in the system must have its reasons; political correctness should not play a part.
- * (i) Is it worth going co-ed simply because it is politically expedient and there is public pressure from certain individuals? What about the children who would be affected during the move?
- * (j) It would be better to invest much more in our present resources, both financially and in terms of personnel, to improve the well-being of teachers and students; the school buildings look tired and money should be committed to improve our schools.
- * (k) It appears that the debate on co-education is politically motivated rather than based on purely educational reasons, perhaps fuelled by needless debates on social media. Why should the whims of those who are not educators determine such a fundamental change to the very fabric of the educational system in Gibraltar?
- * (1) It is not a priority at the moment. Alternative provision for our children, especially those who are disaffected with their schooling, should be top of the list. Fixing something which does not appear to be broken is a risk we take without any evidence to support the improved or impaired academic success of our students and any benefits on a tolerant society as we know it.

4 Conclusions and Recommendations

The overwhelming conclusion evidenced in our research and discussions is that neither co-education nor single gender settings have any substantive basis upon which to claim educational advantage; the data available does not lean significantly in favour of or against co-education. There are, of course, strong opinions on the matter as evidenced in the discussions above.

Notwithstanding, the working party believes that education should be much wider than the purely academic, and the educational environment should reflect reality as it is: that is to say males and

females going about their lives (socially and at work) side by side, and should nurture in children from the very onset and throughout their schooling the belief in the self-evident fact that, although not the same, men and women are equal. This should also help them develop social skills with ease as they interact with members of the opposite sex on a daily basis under the supervision of their teachers.

Our deliberations, discussions and research lead us to conclude that a smooth transition from singlegender to co-educational structures, should see both social and educational benefits from a school environment that is more attuned to society than the mono-gender model, which, for a range of historical and other reasons, reflects past (not contemporary) societies and their values. Our interpretation of education goes clearly beyond schools as mere examination factories obsessed with examination results. Education is an open ended process which works largely through conversation, example and relationships. It is a dialogical rather than a curricula form of education.

Schools should endeavour to aim at forming and educating the whole person in the belief that all persons should have an equal chance to share in the life of the community and the wider world. Education should lead children to seek and uphold the truth, to be critical and to be able to discriminate positively, to be respectful of others and of the environment; it should encourage interaction with others to arrive at informed, committed action. It is an ongoing cognitive, emotional and social process; a process of living in which the end is not the important factor, but the process itself. We therefore firmly believe that a co-education setting is the best way of achieving this vision of education.

There are, of course, pragmatic questions regarding the efficacy of transitioning from one system to another with possible advantages and disadvantages at both an economic and educational level. It is vital that the quality of teaching, focus on student well-being, the offering of a balanced and challenging curriculum inclusive of vocational pathways, and the monitoring of academic standards with a strong emphasis on value added is upheld and guaranteed as we transition towards coeducation.

Furthermore, just sitting in the same classroom is not, in our view, what co-education is all about; it should be accompanied by continuing education in not only the differences between men and women but also what distinguishes them emotionally and psychologically so that they are instilled with a sense of respect for the opposite gender which, hopefully, will stand them in good stead throughout their education and for the rest of their lives. This needs to be achieved through a strong commitment

to personal and health educational programmes, which need to be carefully managed and factored into the curriculum.

While the construction of a new mega school has been discussed by some, the working party would prefer to see co-educational secondary schooling to spread from the existing secondary institutions. New entrants from the middle school sector are often daunted by the prospect of the transition to secondary education; every attempt should therefore be made to ensure they are not overwhelmed by finding themselves almost overnight in an excessively populated metropolis.

In short, the move from middle school, which sees children drawn from defined and, in all probability, familiar catchment areas, into the world that secondary education represents should not only be treated sensitively but should also provide children with the opportunity to mature naturally as they journey through a complicated adolescence and stride purposefully towards adulthood.

The importance of process in any movement towards a new system of co-education should not be underestimated. Winning people over to the idea of co-education, or indeed intermediate models to eventually achieve this, is considered crucial to ensure success. Thus, formal and valid ongoing consultation with students, teachers, union officials and parents is a worthy and valuable approach as we work towards change.

5 Proposed Model for Co-Education

The working party believes that introducing co-education also presents an opportunity to address some of the deficiencies currently inherent in our educational system. The preferred model, as summarised in table 1 below, therefore attempts to address these deficiencies as well as delivering on co-education.

(i) First Schools

All first schools are to take on children from pre-school to Year 2. This would substantially increase the nursery provision afforded; we would therefore operate the same system of catchment areas for nurseries as we do for schools, thereby eliminating the need to allocate places after assessing the individual needs of respective families. The working party believes that high attainment in first school should correlate with attendance at Government nursery. Furthermore, an additional and important advantage is that children would move to middle school at the end of Key Stage 1; the formal assessment opportunities and quality assurance mechanisms are therefore improved as a direct result of this.

(ii) Middle Schools

Middle Schools would take children from Year 3 to Year 6. This would set up a smooth transfer at the exit phase of Key Stage 2, with all the pertinent formal assessments completed across all our middle schools in line with what happens in England and Wales. This arrangement once again makes it easy to quality assure and track the journey of children. The working party places a very strong emphasis on value added; schools must ensure that all children develop their true potential. We therefore need the assessment structures in place to ensure that we can confidently measure this. This arrangement should create a more standard entry into secondary education.

(iii) Secondary Schools

- * (a) Students would commence their secondary schooling at Bayside and Westside at the start of Key Stage 3 (at the beginning of Year 7), with both schools operating on a co-educational basis. The assimilation of an extra year (Year 7) would require both schools to grow in size, each taking on approximately an extra two hundred students; furthermore, the teaching complement in each school might have to grow proportionally.
- * (b) Post 16 provision would operate completely under a consortium arrangement jointly administered by the two respective Headteachers and the Principal of the Gibraltar College, with the College additionally providing a completely revamped vocational framework.
- * (c) The Gibraltar College would continue to deliver on Adult Education and professional courses, with the recently established language school for children expanded to include Mandarin and Computer Programming, and the teaching of English as a foreign language enhanced.
- * (d) Vocational Pathways would also be introduced at an earlier stage in both Bayside and Westside, at the exit phase of Key Stage 3, to include structured outreach work-experience programmes. This fills a huge gap in our current education setup.
- * (e) The details of how Bayside and Westside are populated require special attention. To avoid unfair comparisons (a perceived good school and bad school) it would be necessary to either randomize completely how the schools are populated, or to define the feeder schools that will populate Bayside and Westside ensuring that no one middle school continues to feed the same secondary institution every year, but rather alternates accordingly between Bayside and Westside on a yearly cycle. In

other words, if for example Bishop Fitzgerald School populates Westside one year, it will switch and populate Bayside the next.

- * (f) The allocation of feeder schools to populate Bayside and Westside along the parameters described above is the preferred option because it avoids the possible breakup of established friendship groups. We do however also accept the logistical considerations vis-à-vis traffic and other factors such as siblings in different schools that might require a simpler more permanent twinning of feeder school to secondary school.
- * (g) The working party recommends a bottom-up and indeed top-down approach in order to slowly transition to co-education, rather than a Big Bang approach.
- * (h) The top-down approach effectively means that the sixth form (Years 12 and 13) would start to operate as a complete consortium from the onset; the working party considered and rejected a separate sixth form college: Year 12 and 13 students are role models for younger pupils to follow; they contribute significantly to the positive ethos of the school.
- * (i) The bottom-up approach would take a little longer: Year 7 would commence in both schools operating on a co-education basis, with Years 8, 9, 10 and 11 continuing as single-gender settings, with the Years 12 and 13 consortium fully operational at this stage as discussed.
- * (j) Initially Year 7 students in both Bayside and Westside would enjoy their own ecosystem: a school within a school so to speak; an area especially reserved for them, not quite segregated from the rest of the school, but not fully integrated either.
- * (k) The second year of phasing in co-education sees the arrival of a new Year 7, with the consequent rollout of the incumbent Year 7 students into Year 8: the ecosystem would expand somewhat, with a bit more of the school(s) colonised. Year 9, 10 and 11 (the remaining single-gender years) are gradually being squeezed out bottom-up (by Years 7 and 8) and top-down (by the full consortium set up).
- * (1) Only Years 10 and 11 remain as single-gender years by the third year; Year 11 is the last surviving year by the fourth; full colonisation is complete after five years have elapsed and co-education is achieved at this stage.
- * (m) Throughout the process, and indeed thereafter, it is crucial to guarantee the quality of the teaching. This can be done in two ways: (a) all teachers in the system are accountable to the Code of Professional Conduct recently launched, which sets out what is expected of teachers in their professional role; (b) by introducing a Post Graduate Certificate in Education hosted at the University of Gibraltar that all teachers need to follow, we essentially declare a single pathway into teaching with stringent controls, and thus become the gatekeepers guaranteeing the quality of the new recruits. This will of course require further discussion.

- * (n) A simpler model, which does not alter the year structure across the sectors, can also be considered; in this case there would be no Year 7 migration to secondary, and co-education can be achieved along similar parameters in four years instead of five. This proposal does not require the physical expansion of both schools to accommodate the extra students; furthermore, neither does it require the consequent increase of the teaching compliment. It is therefore economically more viable and would work, however it misses the opportunity of better aligning the schools with the Key Stage system.
- * (o) The working party prefers the former, bolder proposal because it achieves co-education and simultaneously addresses the shortcomings of our current system in terms of formal assessments and the tracking of progress. This mirrors the system in England and Wales.
- * (p) We also considered and rejected a split-site co-education secondary school, with a lower school and upper school campus. The lack of healthy competition and the inability to draw comparative data to quality assure played a significant part in our decision, as did the complexity of implementing such an arrangement.

(iv) Table 1 - a Proposed Model for Co-Education with the Restructure of School Years:

- * (a) increased nursery provision by catchment note that pre-school entry age is still 3 to 4 years;
- * (b) first school to middle school transfer coincides with change from Key Stage 1 to Key Stage 2;
- * (c) middle school to secondary school transfer coincides with change from Key Stage 2 to Key Stage 3;
- * (d) vocational pathways blended with GCSEs;
- * (e) full consortium arrangements henceforth with additional vocational framework (note also that AS exams are being phased out).

Current Model			Proposed Model			
Key Stage	Year	School	Key Stage	Year	School	
Early Years	Reception	First	Early Years	Pre-School	First	(a)
1	Year 1	First	Early Years	Reception	First	
1	Year 2	First	1	Year 1	First	
2	Year 3	First	1	Year 2	First	
2	Year 4	Middle	2	Year 3	Middle	(b)
2	Year 5	Middle	2	Year 4	Middle	
2	Year 6	Middle	2	Year 5	Middle	
3	Year 7	Middle	2	Year 6	Middle	
3	Year 8	Secondary	3	Year 7	Secondary	(c)
3	Year 9	Secondary	3	Year 8	Secondary	
4	Year 10	Secondary	3	Year 9	Secondary	
4	Year 11	Secondary GCSE	4	Year 10	Secondary	(d)
5	Year 12	Secondary AS	4	Year 11	Secondary GCSE	
5	Year 13	Secondary A-Level	5	Year 12	Secondary AS	(e)
			5	Year 13	Secondary A-Level	

Table 1

The working party accepts that these recommendations must be taken alongside Government's plans to develop/improve/relocate some of our schools; furthermore, the Gibraltar Teachers' Association will of course need to be consulted in respect of the changes proposed. Nevertheless, we must profess our excitement at the prospect of delivering on co-education.

We therefore present these proposals for consideration by the Minister in order to (a) encourage further discussion in a different direction or (b) accept present recommendations and request more detailed proposals.

Signed:

Darren Grech (Director of Education, Chairperson) Michelle Barabich (Headteacher, Westside School) Michael Tavares (Headteacher, Bayside School) Kenneth Saez (Headteacher, St Bernard's Middle School) Dympna Holmes (Senior Executive Officer, Department of Education) Stephen Reyes (Parent) Angelique Linares (Parent) Stuart Borastero (President, Gibraltar Teachers' Association)

Appendix 1: Invited to Submit

- * Chamber of Commerce Mr Christian Hernandez info@gibraltarchamberofcommerce.com
- * Duke of Edinburgh Mr Michael Pizzarello mjpizza@gibtelecom.net
- * Equality Rights Group Mr Felix Alvarez equalityrightsgroup@yahoo.com
- * GFSB Ms Gemma Vasquez gfsb@gfsb.gi
- * GGCA Ms Wendy Cumming ggca@gibtelecom.net
- * Childline Ms Jo Abergel joabergel@gmail.com
- * Gibraltar Disability Society disabilitysociety@hotmail.co.uk
- * Gibraltar Scholars (sample)
- * Gibraltar Teachers' Association <u>borastero@gibtelecom.net</u> (extended invitation to all teachers)
- * Gibraltar Women's Association Ms Tamsin Suarez gibraltarwomensassociation@hotmail.com
- * Girl Guides Ms Valerie Makey valmichvi@hotmail.com
- * Hebrew Community Mr James Levy mbjc@gibtelecom.net
- * Hindu Community Mr Haresh Budhrani gibraltarhindutemple@hotmail.com
- * Humanist Secular Society Mr David Gibbins dgibbins@shsgib.org

- * Muslim Community El Mokafi
- * Protestant Church Very Rev John Paddock deangib@gibraltar.gi
- * Roman Catholic Church The Bishop, 215 Main Street
- * Scout Association Mr Mark Rodriguez rodriguezmark50@yahoo.co.uk
- * Students from Bayside and Westside (sample)
- * Unite the Union Mr Victor Ochello victor.ochello@unitetheunion.org
- * Washington Internship Students (sample)

Appendix 2: Research (Publications)

- * Collister Working Party. (1974) A report to Government on the future organisation of secondary education in Gibraltar. A Local Publication.
- * Cooper S. (2010) Single-sex education in the UK and a selection of other English-speaking countries. Sheila Cooper, Executive Director, Girls' Schools Association, UK.
- * Cortés C. (2016) The Perceived Impact Of Single Gender Instruction In Catholic Schools In The Ecclesial Province of Cincinnati. Masters of Sciences in Education, Franciscan University of Steubenville.
- * Datnow A and Hubbard L. (2013) Gender in Policy and Practice: Perspectives on Single Sex and Coeducational Schooling (Sociology in Education). Routledge.
- * Department for Education and Skills Publication. (2015) Gender and education: the evidence on pupils in England.
- * Department for Education Publication. (2014) Preventing and tackling bullying: Advice for Headteachers, staff and governing bodies.
- * Gender and Education Association Publication. (2013) Single-sex and co-educational schooling.
- * Harker R. (2000) Achievement, Gender and the Single-Sex/Coed Debate. British Journal of Sociology of Education, Vol. 21, No. 2.
- * House of Commons Publication, Women and Equalities Committee. (2016) Sexual harassment and sexual violence in schools: Government response to the Committee's Third Report of Session 2016-17. HC 826.
- * Smithers A and Robinson P. (2006) The Paradox of Single-Sex and Co-educational Schooling. Buckingham, Carmichael Press, 42.
- * Spielhofer T, O'Donnell L, Benton T, Schagen S and Schagen I. (2002) The impact of school size and single-sex education on performance. Slough: National Foundation for Education Research, Local Government Association.

- * Sullivan A, Joshi H and Leonard D. (2012) Single-sex and co-educational secondary schooling: what are the social and family outcomes, in the short and longer term? Longitudinal and Life Course Studies, Volume 3, Issue 1, 137-157.
- * Younger M and Warrington M. (2006) Would Harry and Hermione have done Better in Single-Sex Classes: A review of single-sex teaching in co-educational schools in the United Kingdom. American Educational Research Journal, 43, 579-620.

Appendix 3: Research (Websites)

- * http://www.houstonschoolsurvey.com/single-sex-education-old.html#.WI87pbYrJBw
- * https://www.goodeducation.com.au/single-sex-schools-outperforming-co-ed-study/
- * <u>http://www.dailymail.co.uk/news/article-1162831/Girls-far-likely-thrive-single-sex-schools-nationwide-survey-shows.html</u>
- * <u>https://www.agsa.org.au/news/girls-single-sex-schools-significantly-positive-maths-girls-co-ed-schools/</u>
- * <u>http://www.genderandeducation.com/resources-2/pedagogies/singlesex-coeducation/</u>
- * <u>http://www.ncgs.org/Pdfs/Resources/single-</u> <u>sex%20education%20in%20the%20UK%20and%20other%20English%20speaking%20countries.</u> <u>pdf</u>
- * <u>https://www.theguardian.com/education/2016/jan/28/girls-at-single-sex-schools-outdo-those-in-</u> <u>co-education-analysis</u>
- * http://www.independent.co.uk/news/education/schools/should-we-sound-the-bell-on-single-sexschools-2367032.html
- * <u>http://webarchive.nationalarchives.gov.uk/20130401151715/http://www.education.gov.uk/publica</u> <u>tions/eOrderingDownload/00389-2007BKT-EN.pdf</u>
- * <u>http://www.genderandeducation.com/resources-2/pedagogies/singlesex-coeducation/</u>
- * http://www.llcsjournal.org/index.php/llcs/article/download/148/177
- * https://subhashniappana.files.wordpress.com/2011/06/harker-r-2000.pdf