

UGC recommendations for IKS: some serious lacunae

C. K. Raju

Indian Institute of Education

ckr@ckraju.net

The recent UGC guidelines for IKS in the curriculum for higher education¹ have several lacunae.

1. **Vedic math.** Some universities have introduced “Vedic math” in the syllabus.² I have long been pointing out that the so-called “Vedic” math has no connection to the Veda-s,³ or with ancient Indian math, for it is not found in any known ancient Indian mathematical text.⁴ What makes a complete mockery of the guideline is that the current teaching of arithmetic DOES originate with arithmetic found in the Veda-s and in numerous ancient mathematical texts. This Indian arithmetic (and related astronomy) first went to Arabs and Syrians and then spread Europe via Arabs starting in the 10th c. where it came to be known as algorismus after al Khwarizmi’s Latin name.

Europeans accustomed to the pebble arithmetic of the Graeco-European abacus had great difficulty in comprehending various aspects of Indian arithmetic—large numbers, place-value, zero, fractions, negative numbers, etc.—from the 10th c. Gerbert, to 13th c. Fibonacci, Descartes, Pascal, Euler, until the 19th c. De Morgan etc. These European difficulties with arithmetic have never before been brought out. Though they need to be, and the red herring of “Vedic math” detracts from that effort.

Thus, many of those European difficulties are repeated in school arithmetic as taught today, because colonial education apes the Western experience of learning of arithmetic, hence reproduces those historic European difficulties in the classroom in fast-forward mode on the principle that phylogeny is ontogeny.

Therefore, the correct approach to IKS, is to teach the true history of arithmetic, and to traditional Indian arithmetic as it originated. For example, to introduce place-value, large numbers etc. right away. This approach is being tried out in some schools in Kolkata and Bengaluru.

2. **Vedic astrology.** Further, there is the no Vedic astrology either, as pointed out long ago in a debate 20 years ago, when UGC first tried to open 16 university departments of Vedic astrology based on a misreading of jyotish as astrology. Vedanga jyotisha defines jyotisha as कालज्ञानं, and कालविधानशास्त्रं. It does not have a single sentence on astrology⁵ or फलित ज्योतिष), as I had challenged the UGC to point out 20 years ago. In fact traditional Indian astronomy texts from Vedanga Jyotish to Yuktibhasha (including Varahamihira’s Panchsiddhantica, across at least 3000 years do not have a single sentence on astrology. The correct approach is to avoid making a joke of Indian tradition by teaching an unscientific subject of astrology, and to instead teach the scientific aspects of Indian tradition and the Indian calendar,⁶ while emphasizing the religious and non-secular aspects of the Gregorian calendar.⁷ This is being tried out initially in a school in Hyderabad.

3. **Aryabhata vs Kerala calculus.** Again the UGC IKS recommendations speak of “Kerala calculus”. Now, it is true that Whish’s article⁸ on the Indian calculus mentioned only Kerala texts. But that does not mean calculus originated with the Aryabhata school of Kerala, which only carried forward the work of Aryabhata. This confusion is due to several reasons: first of all the focus of the UGC recommendations is only to develop a sense of pride in Indian culture, and not to emphasize

its current usefulness, which would bring it into a position which directly challenges the West. Pride can also be based on false assumptions as the case of Vedic math and Vedic astrology shows.

Second, if one focuses on the current use-value of IKS, the question would immediately arise whether the calculus can be taught better under IKS. No one else except for me has actually attempted this, and the moment one does so it is obvious that Aryabhata's finite difference technique⁹ ("Euler's method"¹⁰) of solving differential (finite difference) equations is far better suited than mere infinite series without any well explicated criterion of convergence. Third, even if the UGC unstated objective is solely to inculcate pride minus use value, a conflict would nevertheless arise in the glorification of the high caste Brahmins of the "Kerala school" over the low-caste dalit from Bihar, Aryabhata,¹¹ though there was no such conflict in the minds of people of the Aryabhata school in Kerala who openly acknowledged Aryabhata's as their guru.

Fourthly, there is a clear conflict between the philosophy of ganita which accepts empirical proof (prtyaksh pramana)¹² and the philosophy of axiomatic mathematics, underlying the real numbers regarded as essential to the teaching of calculus, which rejects empirical proof. ("Beware of being deceived by what you see", in the language of the current NCERT class IX math text which reflects the language of George Orwell "beware of what you can see and hear", regarded as the ultimate in propaganda.)

In my recent talks at PRCM in Australia,¹³ I have reiterated the principles underlying my course on calculus without limits, taught in 3 countries in 5 universities.¹⁴ But the colonized are unwilling even to discuss the differences in a rational way, because it exposes the religious (Christian) superstitions, underlying the current axiomatic philosophy of mathematics.¹⁵

Concluding remarks

This reluctance of Indians even to discuss IKS in its true spirit, exposes the fact that colonial education is not about knowledge but about jobs, and since the best jobs are still in the West, it is about keeping the Western/colonial master happy, and being deferential to them.

Because it is not just IKS, of interest only to Indians, but useful knowledge helpful to all in decolonisation, it seems far more likely that China or Africa or some others who are not so concerned to please the West will first adopt this. Of course, we can always boast after the fact that "we did it first". But we will never be able to explain to future generations why we avoided even discussing this possibility for so long, hence missed the bus. And we would have lost forever the technological advantage¹⁶ which comes from early adoption of a better technique, solely because of our great colonial fear of offending the West.

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<https://www.thehindu.com/news/cities/bangalore/ugc-asks-higher-education-institutions-to-introduce-vedic-maths-astrology-as-part-of-degree-courses/article66839613.ece>.
- 2 E.g. Harisingh Gaur University, Sagar, <https://dhsgsu.edu.in/index.php/en/vedic-syllabus>.
- 3 Raju, C. K. 'वैदिक गणित में वैदिक कुछ नहीं'. *Jansatta*, 10 August 2014.
<http://epaper.jansatta.com/318935/Jansatta.com/Jansatta-Hindi-10082014#page/17/1>, Raju, C. K. 'Nothing Vedic in "Vedic Maths"'. *The Hindu*, 3 September 2014, sec. Comment. <https://www.thehindu.com/opinion/op-ed/nothing-vedic-in-vedic-maths/article6373689.ece>.
- 4 "Nothing Vedic in Vedic Math: response to comments", <https://ckraju.net/blog/?p=100>.
- 5 "Astrology in University education—twenty years after", <https://ganita.net/astrology-in-university-education-twenty-years-after/>.
- 6 E.g. at a Bengaluru school calendar and arithmetic, <https://www.youtube.com/watch?v=tTnm2O7WAhM>.
- 7 "A tale of two calendars", <https://www.youtube.com/watch?v=MvpuC7Dg4e0>.
- 8 Whish, Charles M, 'On the Hindu Quadrature of the Circle and the Infinite Series of the Proportion of the Circumference to the Diameter Exhibited in the Four Shastras, the Tantrasamgraham, Yukti-Bhasa, Carana Padhati and Sadratnamala"', *Trans. R. Asiatic Soc. Gr. Britain and Ireland* 3 (1835): 509–23.
- 9 Gitika 10.
- 10 C. K. Raju, *Cultural Foundations of Mathematics: The Nature of Mathematical Proof and the Transmission of the Calculus from India to Europe in the 16th c. CE* (Pearson Longman, 2007).
- 11 C. K. Raju, 'Aryabhata Dalit: His Philosophy of Ganita and Its Contemporary Applications"', in *Theory and Praxis: Reflections on the Colonization of Knowledge*, ed. Murzban Jal and Jyoti Bawane (Routledge, London, 2020), 139–52, <http://ckraju.net/papers/Aryabhata-philosophy-of-ganita-paper-2r.pdf>.
- 12 ""Indian notion of proof in math" <https://www.youtube.com/watch?v=d85UOuY0DFU>.
- 13 For links to the presentations and abstracts, see <https://x.com/CKRaju14/status/1802818490015027609>,
<https://x.com/CKRaju14/status/1802818490015027609>
- 14 C. K. Raju, 'Decolonising Mathematics', *AlterNation* 25, no. 2 (2018): 12–43b.
- 15 "Practical ganita vs religious mathematics", <https://www.youtube.com/watch?v=zTqL9EkENiI>.
- 16 C. K. Raju, 'California, Indian Calculus and the Technology Race. 1: The Indian Origin of Calculus and Its Transmission to Europe', *Boloji.Com*, 11 December 2021, <https://www.boloji.com/articles/52924/california-indian-calculus>; C. K. Raju, 'California, Indian Calculus and the Technology Race. 2: Don't Cancel the Calculus, Make It Easy!', *Boloji.Com*, 24 December 2021, <https://www.boloji.com/articles/52950/california-indian-calculus-and>.