CADGME 2016 Question time

(Sapientia University, 9.9.2016)

Scribe: Paul Libbrecht

- Question guidelines:
    - 2–3 minutes asking, one answer type
    - one answer choice:
        - long individual: designated answerers
        - opinion: choose between a set of answers (raise hand)
        - vote: choose bteween agree or disagree
    - Some askers have been invited, others can come

Matija Lokar: "It seems that with time all mathematical software accumulates more and more features and tries to "cover all mathematics" - for example a software starts as a "pure DG 2D tool", but with time adds CAS features ... or CAS tool which adds afterwards numerical methods… Do you prefer an integrated tool or several tools. Vote:
-- one integrated tool: 7
-- several tools: 17

Valentina Pikalova: There are universally integrated tools (as universal as MS Office). Is it possible to see such an integrated tool for all mathematical tasks? Vote:
- 8 believe in it
- 10 don't believe in it

Joris van der Hoeven: Considering yourself as a learner of mathematics. What would be the top problem where you would have learned something by doing it using software?
- Christian Mercat: I could only understand the radius of convergence of series, once I played with them with a visual tool.
- Valentina Pikalova: I started to understand locus points and the maximum volume box problem only when I was able to go deeper into them by doing them using the different representations.
- Rein Prank: It was around 88. I wrote a programme for proofs in propositional calculus; having taught the subject since 15 years before. Shortly after three hours after it started to work, I could assert I know completely what was necessary to prove any clause in propositional calculus.

Zsolt Lavicza: Since when you give good questions and good motivations to the student, the kids almost do not need the teacher anymore. Do we really need to be teaching using the front teaching approach?

- 12 say we still need
- 7 say we do not need

Liudmyla Gryzun: Educational tools: Are we harming our students by removing the need to do the reasoning for themselves (e.g. using the tech just to use the tech)?

- 11 say we are
- 4 say we are not

Walther Neuper: What is your personal estimate of the knowledge of mathematics for the learned engineer in a development unit where he/she needs mathematics? (rest needs to be learned)

- 75% is already known: 2
- 50% is already known: 9
- 25% is already known: 6

Masataka Kaneko: What is your experience or opinion: To which extent should the flexibility of mathematical software (in the sense of programming) be supported?
Different answers for students or teachers. 3 first answerers:

- Morten Misfeldt: In some cases, you can detach from the teaching because you just apply a fixed plan: this creates situations which show no engagement.
- Matija Lokar: It should be fundamentally possible; tunability (e.g. adjusting preferences) is important mostly just because it's there: most people are not actually using it.
- Walther Neuper: Confirmed programmability (eg. because you can create something with the tool)… This actually brings lots of users as we could see in GeoGebra.

Setsuo Takato: The DGS GeoGebra is very common around here but not in Japan; but GeoGebra is not so good to make printed material. Why do most teachers in Europe use GeoGebra?

- Matija Lokar: in Slovenia: because it is in Slovenian and because it is free. Also because the teachers of the teachers developed material.
- Joris: because it has good marketing.
- Morten Misfeldt: In Denmark: Resources to buy technology are there but still, GeoGebra is widely used. Among others, purchasing software is an administrative hurdle; distribution is generally not correctly adapted to the schools' realities.
- Christian Mercat: In France, Geogebra is available in the teacher-qualification-examinations. CàRMétal is there too but is rarely used.

Valentina Pikalova: Sometimes we focus much on the instrument; sometimes I focus on the mathematical problem. A colleague uses a different approach: He has a sequence of problems. How to find a nice sequence of problems to let our students think more deeply?

- Janos Karsai: Here is a common joke: "You have beautiful gras in your garden, how do you do that?" "I regularly cut it." "I did the same but it does not work." "Oh, you have to do it since 500 years". Rationale: Be sensitive to students.
- Christian Bokhove: Old books often have sequences of interesting exercises. I was impressed by geometry exercises in a Japanese textbook.
- Christian Mercat: It depends on the level and it's difficult to adjust. Two projects where it worked well: Teaching with programmatic arts (e.g. Vasarely, Julio Le Parc, Riley) got them to think real hard. Gallileum: perform experiment, building by group, describing the phenomenon.

Joris van der Hoeven: What are the three topics for which you would discourage the use of technology?

- Matija Lokar: early mathematics (counting, low numbers, …): missing the physical connection seems to be much less successful.
- Paul Libbrecht: diagramme chases in algebraic topology.
- Morten Misfeldt: Sketching a problem situation (e.g. at the start of the resolution of a word problem)
- Janos Karsai: none at least if you always accept examples. If it's possible to go physical, rather do it. If the problem is well formulated, we can use technology

Matija Lokar: What can we change in this conference to make it even more successful?

- Paul Libbrecht: Make it joint with neighbor field
- Liudmyla Gryzun: (insisting on the even more) The conference's research should focus on deeper results of the mathematical results formulation. Understand better the results of the influence of educational tools: how do they affect the knowledge.
- Csaba Sarvari: More such tasks where we search answers to the difficult questions; e.g. By attracting different competencies.
- Mohammed El-Demerdash: Suggestion of extra working-groups for graduate level teaching; maybe other topics (eg. teacher training)

Janos Karsai: I hope to be wrong: We have been talking about modernizing the technology or the teaching but sometimes nothing changes at the system or department level in 20 years. Do you feel lonely in your research work related to the modernization of teaching?

- Yes: 9
- No: 10