

Undergraduate Mathematics: a journey from a face-to-face to a remote teaching, learning and assessment Discussion

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The goal of this discussion is to bring together ideas for enhancing remote teaching, learning and assessment (TLA) of undergraduate mathematics. There exist

- widely spread/applied methodological principles and approaches in face-to-face mathematics education at colleges and universities;
- a great diversity of good practices in face-to-face mathematics education with and without application of Computer Algebra Systems (CAS);
- 3-semester experience in the TLA of undergraduate mathematics in remote learning environment.

We live in uncertain times. It is important to stay informed on the pressing issues in higher education. What kind of issues appeared and need to be discussed and experience to be exchanged:

- difficulties met by teachers and learners;
- lack of relevant tools and platforms;
- methodological issues: relevant teaching methods, learning strategies and assessment criteria;
- necessity for re-design of learning resources: innovative learning resources and relevant exam questions;
- the increasing role of CAS;

- ...

During the discussion around remote educational process participants could express their opinion about the “lessons learned from the pandemic about effective teaching” formulated by Steven Mintz ([1]) and add their own lessons:

- Teaching online is tough work.
- It's easy for online students to disengage, self-isolate and fall off track.
- Social and emotional issues are as important as course content.
- Coverage and pacing pose a big challenge.

It is expected that remote education will persist after the pandemic. Steven Mintz ([1]) and Janice Florent ([2]) listed the following eight ethical issues:

1. **Equity:** How to ensure that every student has an equal opportunity to learn and to fully participate in our online courses.
2. **Learner diversity:**How to address the special challenges that e-learning poses.
3. **Support:**How to ensure that students have the ready access to the academic, technological, mental health and other supports that they need to succeed.
4. **Feedback and responsiveness:**Making sure that students receive the guidance and feedback they need to succeed academically.
5. **Privacy:**How to ensure that students' right to privacy is protected.
6. **Netiquette:**How to ensure that all participants in the class behave in a civil, respectful manner.
7. **Assessment:**How to maintain academic integrity in an online environment.
8. **Intellectual property:**What rules should govern respect for copyright in online classes.

In the 2030 Digital Compass ([3]) it is underlined that education is being engulfed to the center of the digital vortex. It stays there: “Those who saw digital technologies as tools to enable traditional teaching and learning processes will begin to realize how much more potential they have. The context allows a better understanding of McLuhan, who in the last century warned that “the medium is the message.” Educational changes, infused with digital technologies, are radical, rapid and profound. Last century, education aimed to provide mastery of one set of techniques and skills. In this century, although such training remains necessary, it is insufficient. We are moving toward a new aim: the ability to learn continuously, with awareness about how we learn. ...”

Keywords

Undergraduate mathematics, Remote teaching-learning-assessing, CAS, Bloom's taxonomy.

References

- [1] Steven M. 2021, What the Pandemic Should Have Taught Us About Effective Teaching. The lessons that ought to shape post-pandemic pedagogy. <https://www.insidehighered.com/blogs/higher-ed-gamma/what-pandemic-should-have-taught-us-about-effective-teaching>
- [2] Janice Florent, June 2021. <https://cat.xula.edu/food/what-the-pandemic-should-have-taught-us-about-effective-teaching/>
- [3] 2030 Digital Compass: the European way for the Digital Decade Communication, March 2021. <https://eufordigital.eu/library/2030-digital-compass-the-european-way-for-the-digital-decade/>