Off with the training wheels

Student centered approach to lab work
(a teacher's tale)
Presentation outline

1. Objectives pursued
2. Context of application
3. Process and documentation provided
4. Results after two semesters
5. Conclusions
1. Objectives pursued

- Improve student's involvement and motivation.
- Increase permanent learning.
- Train students to become autonomous researchers.
2. Context of application
2.1. Third semester
2.2. Fourth (and final) semester
3. Process and documentation provided

3.1. Students are provided with:
   - Goal of the experiment (learning goal and scientific goal).
   - List of material and explanation on how to use it.
   - Theoretical framework.
   - Detailed manipulations.
   - Mathematical treatment required for analysis.

3.2. Students have preparatory work on:
   - Theoretical framework.
   - Hypothesis of the experiment.
3. Process and documentation provided

3.3. Students are provided only with:
   - Goal of the experiment (learning goal and scientific goal).
   - Detailed list of concepts to research.
   - 2 hours of class time for preparatory work.

3.4. Students have to come up with their own experiment:
   - Linked to the topic of the class.
   - 10 hours of class time total.
4. Results after two semesters
4.1. Example of experiment

DUFOR-FORGET DANAË

RÉSISTANCE DES MATÉRIAUX

203-034-RL

ÉVALUATION TERMINALE

Déformation de la soie dentaire
4.2. Start of the inquiry
4.3. Results

**Graphique 1 : Force appliquée sur la soie dentaire selon la déformation qu’elle subit**

\[ y = 240.15x + 0.4449 \]

\[ R^2 = 0.9854 \]
4.4. Exceeding of expectations

Graphique 2: Déformation de la soie dentaire en fonction du temps, avec une force appliquée constante
5. Conclusions

• **Improve student's involvement and motivation.**
  – Caused a lot of anxiety for some students.
  – Most students enjoyed this method.
  – Students that were already motivated greatly enjoyed this method.

• **Increase permanent learning.**
  – Some students exceeded my expectations.
  – Most students at least remember the labs (if not the content of the labs).

• **Train students to become autonomous researchers.**
  – No measurable change in their autonomy.