students evaluation of teaching

Machine Learning for Earth and Environmental Sciences
T. Beucler, J. Yu, M. S. Gomez Delgadillo, I. H. Tam
Autumn 22
8 respondents

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attestation

We hereby testify: **T. Beucler, J. Yu, M. S. Gomez Delgadillo, I. H. Tam**

have had their teaching evaluated by the students according to the procedure currently in force at the University of Lausanne.

The following teaching has been evaluated:

Title:	Semester:	Number of respondent·s:
Machine Learning for Earth and Environmental Sciences	Autumn 22	8

Lausanne,   09.01.23

students evaluation of teaching

Machine Learning for Earth and Environmental Sciences
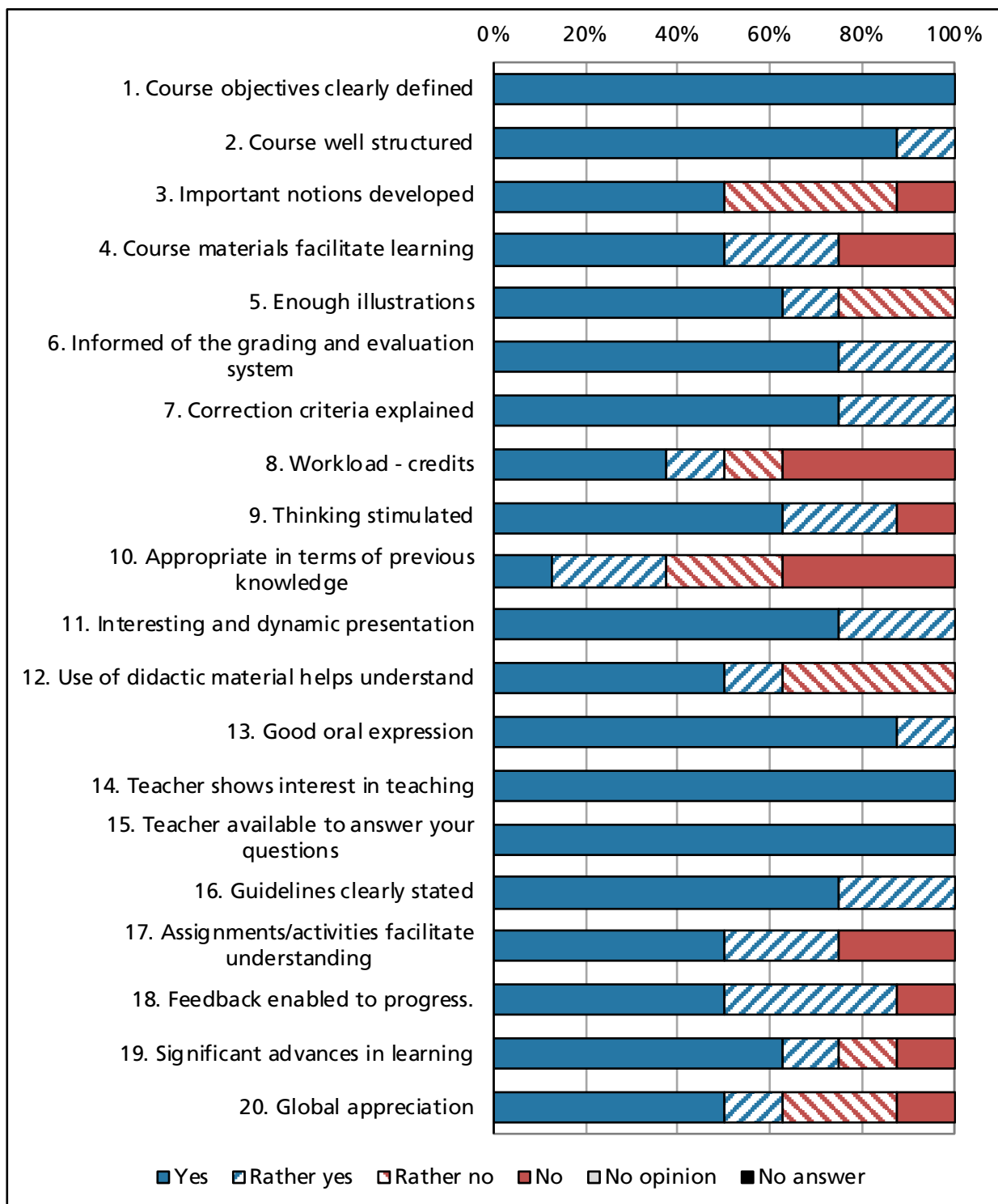T. Beucler, J. Yu, M. S. Gomez Delgadillo, I. H. Tam
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graphic

Students evaluation results for questions 1–20.

■ Yes ▨ Rather yes ▨ Rather no ■ No ▨ No opinion ■ No answer

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frequencies and percentages

In which Faculty are you registered:

FTSR	0
FDCA	0
LETTRES	0
SSP	0
HEC	0
FGSE	8
FBM	0
EPFL	0
Other	0
No answer	0
TOTAL	8

In what year of your program:

BA1	0
BA2	0
BA3	0
MA1	4
MA2	3
Other	1
No answer	0
TOTAL	8

For you, this course is:

Optional	6
Compulsory	2
No answer	0
TOTAL	8

		No	Rather no	Rather yes	Yes	No opinion	No answer	TOTAL
1	Course objectives are clearly defined.	0 / 0%	0 / 0%	0 / 0%	8 / 100%	0 / 0%	0 / 0%	8 / 100%
2	The course is well structured.	0 / 0%	0 / 0%	1 / 13%	7 / 88%	0 / 0%	0 / 0%	8 / 100%
3	Important notions are sufficiently developed.	1 / 13%	3 / 38%	0 / 0%	4 / 50%	0 / 0%	0 / 0%	8 / 100%
4	Course materials facilitate learning.	2 / 25%	0 / 0%	2 / 25%	4 / 50%	0 / 0%	0 / 0%	8 / 100%
5	The course was supported with enough illustrations.	0 / 0%	2 / 25%	1 / 13%	5 / 63%	0 / 0%	0 / 0%	8 / 100%
6	You were informed of the grading and evaluation system before the exam.	0 / 0%	0 / 0%	2 / 25%	6 / 75%	0 / 0%	0 / 0%	8 / 100%
7	The correction criteria have been explained.	0 / 0%	0 / 0%	2 / 25%	6 / 75%	0 / 0%	0 / 0%	8 / 100%
8	Workload is appropriate in relation to the number of credits given to the course.	3 / 38%	1 / 13%	1 / 13%	3 / 38%	0 / 0%	0 / 0%	8 / 100%
9	Your thinking is stimulated.	1 / 13%	0 / 0%	2 / 25%	5 / 63%	0 / 0%	0 / 0%	8 / 100%
10	The course is well appropriate in terms of your previous knowledge.	3 / 38%	2 / 25%	2 / 25%	1 / 13%	0 / 0%	0 / 0%	8 / 100%
11	The course is presented in an interesting and dynamic way.	0 / 0%	0 / 0%	2 / 25%	6 / 75%	0 / 0%	0 / 0%	8 / 100%
12	The use of didactic material helps you understand the concepts that were taught.	0 / 0%	3 / 38%	1 / 13%	4 / 50%	0 / 0%	0 / 0%	8 / 100%
13	The teacher's/teachers' oral expression is good.	0 / 0%	0 / 0%	1 / 13%	7 / 88%	0 / 0%	0 / 0%	8 / 100%
14	The teacher shows/teachers show interest in teaching.	0 / 0%	0 / 0%	0 / 0%	8 / 100%	0 / 0%	0 / 0%	8 / 100%

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		No	Rather no	Rather yes	Yes	No opinion	No answer	TOTAL
15	The teacher is readily available to answer your questions.	0	0	0	8	0	0	8
		0%	0%	0%	100%	0%	0%	100%
16	Guidelines for completing the assignments/additional activities are clearly stated.	0	0	2	6	0	0	8
		0%	0%	25%	75%	0%	0%	100%
17	Assignments / additional activities facilitate understanding of the concepts taught during the course.	2	0	2	4	0	0	8
		25%	0%	25%	50%	0%	0%	100%
18	Feedback on your work enabled you to progress.	1	0	3	4	0	0	8
		13%	0%	38%	50%	0%	0%	100%
19	You have made significant advances in learning in this course.	1	1	1	5	0	0	8
		13%	13%	13%	63%	0%	0%	100%
20	On the whole you appreciate this course.	1	2	1	4	0	0	8
		13%	25%	13%	50%	0%	0%	100%

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comments

Each line corresponds to a student's answer		
strengths	**aspects to be improved**	**comments, clarifications, suggestions**
Very in-depth and well explained course on Machine Learning for Climate Sciences	At this point, I think the course is very well structured with lectures, quiz and lab. The course was very interesting and covered each topic very fast due to the time limit. It would have been nice if there were more classes.	
Very helpful and friendly teaching staff. Dynamic teaching.	This course severely overestimates our prior knowledge of mathematics and of programming. Most of us have studied neither. It attempts to cover too much material in too little time. There is no time to properly assimilate and apply new knowledge. At the end of this course, I have not retained sufficient information to be able to know what applications the various ML algorithms are best suited for. Because most of the code is given to us, I have not significantly progressed in general programming skills either. My concrete suggestions are: 1. This could easily be a full-year course. For one semester, reduce the scope to introducing SVMs, classifiers and regressors, including their mathematical principles. Do not cover ANNs, which are considerably more complex; 2. Focus on applications: we are not data scientists and as such, will most likely not develop our own algorithms. Give us several examples of real-life applications we can try out ourselves (e.g. transferable codes pulled from GitHub); 3. Reduce or even completely discontinue the theoretical guided readings. On average, they took me about 5h a week because I do not have sufficient programming or mathematical background to be able to read selectively. The Géron readings are of little to no pedagogical benefit as you go over the main points in the following lecture. 4. Provide a much more basic template for the final report. Most of us have never	This feedback may seem harsh, but it is important to understand how completely overwhelmed we were with this course. However, I appreciate the availability and helpfulness of the entire teaching staff and am grateful for it.

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	used LaTeX before, and we lose a lot of time trying to understand the customised functions used in the IMCL template. TL;DR: Unfortunately, there is too little programming in the FGSE study plans. Focus on basic programming skills before moving to ML as we end up cutting too many corners and being able to do neither.	
- the course is very complete; we go through a lot of different models from linear regression to CNN (especially in the notebooks and the book), the different course material (book, articles, notebooks, classes, project) help a lot to understand. - good overview of a lot of different concrete applications - having a peer-review for the project is awesome - the teacher is looks really motivated and knowledgeable, and the TAs and himself were available which was great - special thanks to Milton who is very patient and very good at explaining difficult concepts in a easy way! :)	- it is way too dense. 8 weeks it too short for all everything that we see. I really wish to be able to understand more of the key concepts but I just don't have time to. - while Géron's book is good and clearly explained, I don't feel that the guided readings helped at all; it was too complicated for me and I just ended up guessing or simply not answering. Same for the articles, some of them where just too hard to understand without external explanations. - I wish we had more time for questions and discussions in class, as a few times the questions asked in the guided readings were not addressed. - I also wish we had more time for the project, instead of notebooks. especially the notebooks about the scientific articles that where hard to understand.	I loved the cours and how it is presented! But while I know I learned new things made a lot of progress, my overall feeling is mitigated because I feel that I could only get about 30% of what was presented and instead of being happy of new knowledge and skills I feel a bit discourage looking at the other 70%.
The strengths include a lot of the grade is participation based (completing guided readings, quizzes and notebooks) which allows you to learn and practice the skills without having to be worried about getting everything exactly correct. The professor really supports students in learning concepts.	The workload for this course is quite high (even for a five credit course), especially in the last weeks balancing completing all the required weekly tasks along with the project is difficult to balance.	

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It is new and teaches us a lot of not only useful but essential in the current market and can be very helpful.	I wish we would have learned more about installing the packages and using them on our own computers instead of google collab since transitioning from collab to vscode or sublime text for example i had a lot of problems doing the pip install thing which i did not know of before.	I hated this course and kept hating it until i loved it and now am obsessed with these machine learning techniques and am trying to continue learn more about them on my own. Though the book chapters are informative i wish you would have given us what we needed to learn as slides in your own words and they be describing everything as "high school student would understand" since the book as a first read although informative can be very very very hard to understand. other than that, you did a great job introducing such a high-level topic to people with only basic knowledge of python. Thanks a lot for that you opened new horizons for me with this course.
very interesting class, good that we have the option to learn this advanced class at UNIL	the workload is too much, it's 5 ECTS and it would be impossible to have 6 classes with this much workload in a semester (it would be 30 ects and that would be a normal semester)	TA and prof are amazing, they do everything perfectly, this class should continue for the years
Learning to code python and improve the English scientific reading.	The question on the quizz was way too difficult. I think for the reading, the best way is to make optional the scientific article rather than compulsory.	

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"the only strengths i see is the availibilty of the teacher and the TAs to helps us advance in the notebooks.
- also the commitment and interest with which the course was given by Tom."

ok so I hope you are ready for a bit of reading... I'd be aghast if my computer didn't crash out of overheating and overflow error generation.
PART I - COMMENTS ON THE COURSE

MLEE course evaluation
1)Course requirements
-First things first. This one is probably going to sound a bit too harsh, but I demand you pay sheer attention to it, as it will be of significance for the future (especially for future courses in the upcoming years.). I do believe the MLEE course wasn't meant for ENVIRONMENTAL science students but rather for Data Science students in first year of master's at the EPFL. This is why: The only course we had was an introductory course to Python. But it did not suffice for us to keep up with the MLEE course's requirements. It was just too fast, and the rhythm imposed was way (I mean, WAY) too hard to follow personally.

-I really don't think compressing (as a zip file) a MLEE course that much into an 8-week long extremely intensive course helped us grasp one tenth of the matter. Actually, the fact that we had to jump on a completely new matter each week made it even more difficult to my mind.

-I personally felt too pressured, as we had to deal with a completely new and conceptual matter, that we had to put

PART II -Suggestions/ final thoughts

Before moving on to several suggestions, I'd like to say that in no case all I have said was meant to offense anyone, but rather to tell all TAs how I felt and what the overall feeling was.

1)Course requirements:
-Either the course stays as it is, and everyone knows how it's going to unfold. Or:
-You could consider splitting it into a 14-week theoretical + practical course during semester 1, with notebooks and readings, without project.
-14-week th + practice course, without readings, with less notebooks, and a final project to do during semester 2
-A whole year, so that we could understand more
-14-week theory + notebooks, 4h a week+ semester 2: optional 2h a week for a course that could be entitled "ML, possible application to master thesis", where you and the TAs could be assessing the feasibility of a Master project. That would be time-consuming but worth giving it a shot.
-Of course, fill the light spring semester 3rd bachelor's year with the introductory course to PYTHON (4 weeks, same format as for the actual python course, 4h a week, February to May, so that we can still work on our bachelor thesis) ===> 14-week course for the master.
-And last: not put the course for 1st year

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into practice through long notebooks, whose code was impossible to understand at is fullest. Not to mention the utopia of covering an entire ML program in only 8 weeks. honestly, that's just not realistic.

-The fact is, everybody attending the course did not have the required tools to be able to implement the coding/ algorithmic parts into a real project, for instance. The reason being, that we just got swamped by such a heavy workload that we didn't even have the opportunity to assimilate the matter. As far as I'm concerned, it's something that made me struggle a lot to grasp the conceptual notions covered during class. I'll let you refer to the suggestions I made, as the least thing I want to do is drag the TAs down. It's just meant to make you realize what we've been through the whole semester, as a way to improve the course (because I truly believe we've all been feeling the same, and I wanted to say out loud what has been, for most people, kept secret).

2)Readings and notebooks
-We knew we had to spend a lot of time on MLEE, but not to a point where it became overwhelmingly mind-burning. The fact is, this is what happens when students are given an 800-pages long

students, because including our master thesis dataset can't be possible, as practically no one has taken contact with their supervisor.

2)Readings and notebooks:
-The course is too hard for us (audience not the right target). So you should consider spreading the course over at least 2 semesters (utopic I suppose) or diminish your requirements and expectations. So that you just provide the tools to use to environmental scientists (which is the goal of such studies, as we're not web developers, but algorithms appliers, for instance in QGIS etc., all SQL requests are algorithms) because I had the feeling I was drowning.

3)Assessment basis
-I suggest you should go back to the old-school assessment methods: feed theory, give deadline, evaluate, take into account preparation time (for next session). Not giving a quiz directly after giving an enormous number of notions that are smushed together in a too thoroughly-timed schedule (min 15-30/ 45-60/ etc.) stressing out students.

-Change the 'participation-based and anticipated success' into a practice-based evaluation, for instance by evaluating only the project, or the notebooks.

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book written by a data scientist whose experience spawns over 3 times our age. That makes 100 pages a week, of completely new and conceptually intricate notions over which we had to answer at least 10 questions that, personally, took me at least 5 hours instead of the 3 written in the syllabus document. That was the case, till the thorough reading was replaced by the commonly used CTRL-F command to save up some time. Because there was a lot of work and projects going on in other classes also. Had we only had MLEE this semester, we could have had the time to dive into the matter more "easily", to put it that way. Then, the notebooks. While they were a sometimes good tool to put into practice what we'd seen in the previous class hours, they were quite often long to finish up, given that half of the code wasn't understood. Upon discussion with a lot of my teammates, the average time spent on them sometimes reached 10 hours a week. That, in turn, impeded on the rest of my classes, as I felt I had to keep up with the rhythm so as not to get lost and at least grasp the strict minimum.

-So I think we have to picture to ourselves the fact that dealing with 100 pages a week of very complicated notions (not developed during our bachelor's program) obviously became impossible, and thus impacted on our understanding and assimilation. That saddens me,

Because here even answering the quizzes completely wrongly did already guarantee you'd pass, because that's something that's been said as if it'd been promised. But that ain't how school works actually. It's simple. Either (1) you have to make half the people fail on the old-school basis (but again, that's because it's not targeted for the right audience, in which case you should redefine the aims of the course and the skills to acquire + level of understanding of the algorithms   do you want your students to master and create, develop algorithms? If YES, then you have to take into account their background and apply the good approach   starting from 0, so at least 26 weeks needed   but that's for data scientists with 3years of bachelor at EPFL at least/ if NO, then you should clearly state and define the aims of the course and not dig into 800 pages learning because that's impossible.), or (2) you adapt the course to the audience, adding PYTHON courses to the bachelor's program, when you meet up with the FGSE committee at the next general assembly with the rectorate. Trust me, they'll listen to you, because you have something to say, plus if it's for the common good.

4)Personal project
-Again, see if it could be possible to fit in a 2- hour optional course on semester 2 of 1st year for instance (more precise idea of master thesis)

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because I saw the potential such a course could have on a master's thesis. But I was overwhelmed.

-Last thing on the readings. I must have come across the sentence "explain it to a high school student" at least 3 times over in each reading. But how would we be supposed to tell a 15-year-old student what we don't understand for the most? This oversimplification makes it ludicrous, as it's really not something that we could be vulgarizing.

3)Assessment basis
-I think the way this course was assessed was skewed by the fact that it was way too hard for us all. This resulted in a participation-based assessment and evaluation, which I do believe was chosen to counterbalance the hardness of the course, so as not to assess the students on a too severe basis (had we been assessed the right way, take the quizzes' results for instance, there would have been a lot more failure). And I personally think this was not a good way to assess us, as any participant doing even 0,5 point out of 6 (that also was a common score by the way) could still attain 95%.

-So instead of basing only upon participation, giving quizzes directly after having covered the matter (which to my mind is an absolutely counter-productive and anti-pedagogic way of making students assimilate the matter), why not just let the students 'digest' the theory,

5)Peer-review
-To my mind, should be suppressed and done by the likes of people like you and by all TAs.
-It could be followed and supported by a discussion also.

PART III - Conclusion
In light of the aforementioned detailed points, I really suggest you judiciously consider rethinking the organization of this course. I'd beg you to at least open you eyes as to what we've been through, should nothing change. THANKS A LOT FOR READING THROUGH THIS POINT

This could make forthcoming students' program easier.

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just let the students 'digest' the theory, work well on it and take the quiz on the next session (usual way of testing students' knowledge)? That way you could account a low result for either a bad understanding of the theory or of a lack of work (that's not your problem though).

4) Personal project

-If you ask me what my take on the project is, here's what I have to say: I do think we didn't have enough time to dive into the project. Here's why: we had barely had the opportunity to get used to the rhythm imposed by both the weekly notebooks completion and readings, that directly early November we had to discuss a project on whatever dataset of our choice, using an algorithm (knowing we still had 4 weeks coming along with 4 new notions at least to take in).

-But here's the problem: in the syllabus, it is stated that – from week 3 to 8 – we'd have the opportunity to start working on our project. Honestly, that was utopic, I personally began no later than on week 7... because of point 3's evidence, showing we already had 15h a week of work. We couldn't cope with that much of a workload.
-So either you put aside the project part (renounce it) and continue to build knowledge and assimilate matter a bit more easily by doing the notebooks and the readings (which I'm persuaded didn't help at all, as the matter covered clearly

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-help at all, as the matter covered clearly requires a strong data-science background, which we do NOT have, or you maintain that project but be sure that it can't be perfect.

-The fact is, it is pointless thinking that incredibly looking and promising projects mean that the student has understood everything of ML and has come up with a topnotch project, thanks to self-taught code generation. I think the fact that the course was so condensed, made us choke and pressured us, as we had to "get things going" and jump onto the final project directly, thus cutting corners. But one should bear in mind that because of the unmatched pace at which the course was given, copy-paste code was soon a common practice, without understanding. Because everything was superficially covered and couldn't be assimilated.

-So saying "don't copy-paste code without understanding" is actually petty, as we all know it's what all of the students have been doing (me included). But again, because it's way too hard. Or it's also related to the expectations of the course, linked to the target audience. But we'll get back to that.

5)Peer-review
-Sorry, but that one cracked me up. You can't take part in a peer-reviewing process, unless 1) you are a peer (so at least you're a researcher who knows

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least you're a researcher who knows what's he/she is talking about) or 2) you're pretending to be one by role-playing. A hint, that's the second option we did. Because I can't pretend to help my classmates on the grounds that I know something of ML. I can't because my opinion would be erroneous, as I have not assimilated the matter, nor am I data scientist. That's why the peer-review process does not make sense to my mind. You should consider suppress it.