Being a 'Lenient' Math Professor

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Abstract. This study aims to discuss issues faced by mathematics professors in teaching mathematics at some US universities during the COVID-19 pandemic. In attempt to accommodate students during the unprecedented time, how lenient should professors be? This study also outlines practices done by professors in shifting their teaching ideals to support students overcoming the challenges in mathematics distance learning while grappling the pressures of teaching evaluations.

Keywords: COVID-19 pandemic; distance learning; mathematics; professors

1 Introduction

COVID-19 pandemic has significantly affected many aspects of our life and caused most higher education institutions across the US to convert into distance learning rather abruptly. With the spread of distance learning, there is an increased need to discuss the associated challenges for both professors and students. Study [4] shown that students taking online courses are less likely to participate in collaborative learning activities, discussions with others, and student-faculty interactions, compared to their counterparts in in-person settings. Having distance learning during a crisis as bad as the COVID-19 pandemic, many professors left their ideal teaching practices to accommodate unexpected situations that their students might be experiencing. The grading policy, due dates scheduling, and overall strictness of the course made to be more lenient and understanding to the possibility of students who not only struggling with the sickness, but also with unemployment, taking care of their parents and siblings, jobs that had them overwhelmed, financial situations and/or the lack of decent internet connection or safety measures.

While it is true that no one should fail a class because of the pandemic, how lenient (or not) should professors be with students during the pandemic? In mathematics courses where many students are already struggling with the materials to begin with, this study discussed challenges faced by mathematics professors in supporting their students, what alternatives they offered, and the additional challenges that comes from those alternatives. In a period where students are stressed more than ever before, a natural question is how mathematics professors should sustain good teaching practices while simultaneously being accommodating to their students, in a way that their evaluation scores will not put their career at risk. Ideally, more data could better this study to a certain degree. While some data used here originated from the results from published research, other parts involve opinions and experiences from the environment surrounding the author. The next two sections describe the challenges of distance learning and what being done to overcome them. The conclusion section summarized major points of the study.

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2 Distance Learning

At the early stages of distance learning, many universities offered hybrid courses where students attend class in-person alternatingly while the rest attend online. However, as the pandemic worsen, more universities are forced to fully converted into distance learning. This section discusses challenges and varying views on several components of distance learning implemented by US universities, especially in the mathematics department.

2.1 Course Delivery Methods

Distance learning for mathematics courses at higher education institutions in the US is delivered in formats that can be grouped broadly into two categories: synchronous and asynchronous. Synchronous learning happens in real time, often with a fixed meeting schedule and required students to login and interact with their professors and peers. Asynchronous learning does not require real-time interaction, contents are made available online for students to access when it works best for them. Both formats have their own advantages and disadvantages, and each comes with arguments on being the better practice. A lot of students feel not being accommodated enough in asynchronous setting since they lost interaction for human exchange or learning purposes. This makes sense since students ended up paying in-person learning price for something they can find online for free. Students also struggling to keep themselves disciplined and motivated as there is no fixed schedule. However, students who are financially forced to take more jobs during the COVID-19 pandemic highly prefers asynchronous setting since it is more accommodating to their schedule.

Synchronous learning comes with many challenges as well. On one hand, professors who classified as "body teachers" think that it is important for them and their students to see each other to create classroom relationship and made it possible to integrate gestures and/or show objects while explaining something. On the other hand, there are also "blackboard teachers" who prefer that students focus on the content of the presentation and so it is better for everyone to keep their camera turned off [3]. Sharing some anonymous colleagues' stories from different universities, synchronous learning with camera on has a risk of showing something that should not be shown to public, let alone being recorded. However, synchronous learning with camera off also have a downside. Many students are only logging in without even paying attention. Professors often asking questions that never get answered and/or seeing many students not realizing that the class was over since they were never actually there. More on this participation issues are discussed on Section 2.4.

A survey done by a professor at the University of Cincinnati shows that students' performance in Calculus courses are higher when the course is delivered synchronously. Consequently, professors who are assigned to teach Calculus or lower were asked to use synchronous setting. However, this is not necessarily accurate. The survey did not take the consideration that students who took synchronously delivered course were mostly full-time students, while many students who took asynchronously delivered course were students who had full time job (or multiple part time jobs) to the point they cannot afford to enroll to synchronous courses. There might be no correlation at all between students' performances and delivery methods, and the differences might be caused by external factors. On one hand professors were asked to be lenient towards students' schedule and deliver their course with the flexibilities of asynchronous learning. On the other hand, professors also asked to be lenient towards students' need of human interactions and provide guided schedule with synchronous learning.

2.2 Digital Platforms

Digital platforms are essential component to distance learning. Several main platforms used at US universities are Zoom, MS Teams, and Cisco Webex Meetings. At the University of Cincinnati's Department of Mathematical Sciences, some professors prefer Webex as it is integrated with Canvas (university Learning Management System). Some prefers Zoom since that is the first platform they know after moving online, and not everyone are fond of changes. Others prefers MS Teams for its user interface that is similar with social media, enabling students to post, tag people, comments, and have group chats. As each of them comes with their own perks, both students and professors are forced to master all of them. There are courses where the lecture given via MS Teams, recitation conducted via Webex, and professors' office hours offered via Zoom. There are departmental meetings conducted on Webex, instructor team meetings conducted via MS Teams, and personal development workshops offered via Zoom. Other than those main platforms, there are also helpful online tools that are commonly used for teaching college mathematics, such as Desmos, GeoGebra, and Kahoot.

Over one year after adapting distance learning, most professors and returning students are somewhat accustomed to all platforms and online tools that are commonly used in mathematics classroom. However, this can be challenging for incoming students, especially ones who are not privileged enough to be a technophile. To accommodate these students, professors should explain in detail on their syllabus how to download, install, and use every single platform that are going to be used in their course, or at least provide links to websites that provides those explanations. Even when professors provide all those resources, the fact that students are unlikely to read the syllabus prevent students to realize the need to prepare and familiarize themselves with these platforms before the course started.

To encourage students to read the syllabus, professors can create a Syllabus Quiz at the beginning of the semester. However, since professors must be lenient during pandemic, quizzes (including a syllabus quiz) cannot be set to due before the end of the first week or sometime even the end of the second week, which sadly defeat the purpose of having them. In mathematics courses where the first week materials often are the foundation of the whole course, having students struggling with platforms is far from ideal.

2.3 Security

When everything moved online, the demand for proctoring software and anti-plagiarism tools skyrocketed. For test proctoring, universities integrate proctoring software such as Respondus, ProctorU, Proctorio, Examity, and Honorlock into their university's Learning Management System. Students will be recorded via their webcam during the exam. The software will block students from opening different browser's tabs or different programs other than the exam page. They will also notify the professors if their AI recognized suspicious activities. Honorlock, for example, will flags students if their face is out of camera, if there are other people captured in the background, if conversation happens, or if students tried to copy and/or paste something to the answer box. As fancy as it sounds, the software comes with many drawbacks as well.

Honorlock often cannot properly recognize faces, so things like photos, posters, banners, or even plushies will get mistaken as other people in the room. In one test, Honorlock manage to suspect my students' plushies as people, yet fail to flag students who had their phone on the table in plain view. Also, as these are third party software, professors also cannot control when the software developer decided to do an update and caused the software to not work properly in students' devices, yet of course, the students will blame the professors for it. Even worse

issues with this software, when one typed the software's name into YouTube search, first few videos on the search results are guides on how to cheat around them or bypass them altogether.

While many anti-plagiarism software is available out there, mathematics courses normally are not using them due to their inability to check plagiarism in mathematics language. It is a well-known fact that many students rely on websites like Chegg, Slader, and Course Hero to complete their assignments, but almost the only way for professors to check this kind of math plagiarism is to directly go to those websites and search for the questions. Since these websites pay people to create answer key on math textbooks or answering math questions on uploaded documents, many people contributed very willingly, providing cheating resources for US students.

Other than the obvious cheating issue, the other problem is that no one is checking the validity of those paid answers. Irresponsible contributors will only take the money without caring how many people they led astray. Some professors had their students complaining with arguments ended with "…because Chegg said so!" In fact, some university professors were intentionally becoming contributors to those websites and upload incorrect answers to their own assignments in order to trick their cheating students. Seeing how students actually paid to access these websites is heartbreaking, yet during the pandemic, Chegg stock price has been more than tripled, earning the title "superspreader of cheating" on an investigation conducted by Forbes magazine.

2.4 Communications and Participations

The paper [6] refers several other studies agreeing that effective communication is critical for institutions of higher education during a crisis that disrupts academic continuity. The university plays a large role in communicating important information to students, but it is often left to faculty or staff to answer questions and to clarify any confusion. With distance learning, there are gaps between updated information, and misunderstanding happen more frequently.

Before COVID-19 pandemic, students can go straight to their professors' office to asking questions, and professors can go straight to department administrators' office to clarify things. With distance learning, it is easy for professors to miss students' emails since their inbox is normally flooded with thousands of unread emails. It is also taking longer for the department and/or university to clarify things with the professors. One of my students said he appreciated how fast I am on replying to his emails as his other professors can take days to over a week to reply to his emails. This sounds bad for students' point of view, but they also need to understand that not all professors are single, have no kids, or can stay in front of their computer all day. Many other students feel uncomfortable to reach out to their professors via emails and are favor the idea of searching unrelated help from unrelated people online.

Distance learning also created the issue on students' participations. As discussed on Section 2.2, students' participation is a problem on both synchronous and asynchronous settings. Running traditional one-way lecture in distance learning where professors cannot walk around the class to engage the students are preferable for an easier teaching, but not an effective one. As a student said: "…the breakout rooms were really helpful because it was just more interactive and helped me be not as distracted. Whereas, in my other classes, it was just a bunch of students watching a video." This is true from professor's point of view as well: "…it was just me (the professor) talking to empty screen with bunch of initials."

However, seeking to increase students' participations using breakout rooms and groupwork is often not the best practice for mathematics courses. STEM subjects, especially

mathematics, cannot be solved by exchanging opinions. Students cannot come to class unprepared and pull opinions based on how they feel about Calculus or Algebra problems. There were cases where professors ended up disbanding groups since some members only waiting for the 'smarter' students to do the work for the whole group. These 'smarter' students ended up stop coming to class since they have nothing to gain from the group, and the professor was blamed for 'unfairly' setting them up with uncooperative groupmates. On some occasions, students even accused that the groupwork was set up because the professor is too lazy to teach the class, even when pre-groupwork lectures were posted beforehand and it was either the students are too lazy to watch them or the announcement and/or emails went into their junk folders.

Distance learning also has a higher awkwardness level than in-person learning [6]. To ask a question, students have to unmute themselves and then the whole class stops and listening. Compare this to in-person classroom experiences where students were constantly working in groups and could easily and modestly raise their hand to ask the professor for help at any time. The classroom then become awkward since it regularly gets silent when the professor invites students to ask questions, and students find this awkwardness difficult to overcome. Another attempt to increase participations is to call out students' name during class. Professors can use online tools like wheelofnames.com to assure students that the calls are random, and no one is being singled out. This seems to be a good idea, until students who being called are not answering the question because they were not present or pretended to have audio issues because they do not want to answer. Since professors must be lenient during this unprecedented time, they cannot penalize students for lack of participations, and there is no way to check whether the students do have audio issues every time their name got called.

2.5 Evaluations that Fails to Evaluate

Ideally, teaching evaluations are used to provide feedback to professors and guide their professional development. They relied heavily on students' evaluation forms and classroom observations by department committee. Data show that teaching evaluations score are moving on the constant or upward trends, however, it is unclear whether this translates to better job being done in teaching [7]. In fact, how evaluations are used as main components of professors' reappointment, promotion, and tenure (RPT) process has deviate the actual objective of having those evaluations.

In the first place, teaching evaluations are mostly not measuring how well the professors are teaching [2]. This becomes even more true with distance learning. Many students simply give higher evaluation scores for courses that they can pass easily, regardless of what the professor did. For mathematics professors, in a country where mathematics is the most hated subject, this is a big reason to put aside their teaching beliefs and philosophy to keep their job and feed their family. Here is one among some bad evaluations (3 or lower out of 5) that I received during the COVID-19 era:

"I'd say this is the hardest class I've ever taken. She was nice, helpful, quick responsive but she gave students A LOT of homework. Problems on the tests are way harder than that on assignments. All tests are honor lock. No calculator, no notes, no book during the tests."

Note that students were aware that I had no capability to modify homework and tests problems as they were made beforehand by a team of instructors and a course coordinator. Also, it is the university and department's decision to use Honor lock as the proctoring software. Compare this with the time prior to COVID-19 pandemic: Proctoring software are not needed, and the same amount of homework is probably will not be classified as 'A LOT' if students do not have to compete for laptop usage time with their family members. When

taking in-person test, having no calculator, no notes and no book is ‘normal’ since everyone is doing it. After distance learning, many non-STEM majors converted their tests into reading assignments or projects or some other form of assignments that mathematics courses unable to follow. It is easy to see that I rated low for things that I have no means to control at all.

Additionally, as many mathematics professors at US universities are international professors, many poor evaluations blame accents and speech unclarity on the recordings, no matter how fluent the professors were in English. Furthermore, study shows that gender bias against female professors is evident in the US [2].

In that study, students were taking a single online class with either a male or female instructor. In half the cases, the instructors agreed to dress in virtual drag (the men used the women's names and vice versa). The result is quite depressing: The same instructor, with all the same comments, all the same interactions with the class, received higher ratings if he was called Paul than if she was called Paula. This brought up the question: why does evaluations, an unreliable, highly subjective, inaccurate measuring tool, had to be the most important factor for professors to keep their job? How lenient and how far on being a grade inflator a mathematics professor should be to actually receive a decent evaluation?

3 Providing Accommodations and Lowering the Bars

Converting to distance learning during the pandemic has become a necessity to the point that the advancement of online teaching is prioritized over the traditional in-person learning. However, students came from diverse backgrounds, and not everyone enroll to a university with the same capability in adapting to distance learning. Whether it is the gap in financial standings or comprehension levels, universities across the country are striving to implement the ‘no student left behind’ approach. More often than not, the burden that come with that mindset got handed solely into the professors’ hands.

3.1 Accessibility

One of the main challenges in distance learning is students’ capability in providing themselves with the necessary devices (laptop/PC and webcam). Many students share a single device with parents who work from home and/or siblings who also need to do distance learning. The obvious consequence is students’ inability to submit assignments on time and some rarely able to attend class since they need to use the device alternatingly with their siblings. Some universities provide special program where students can borrow devices from the university and return them at the end of the semester. Donations from community and alumni partly fill the demands for laptops. Non-profit organizations, often pioneered by fellow students, are collecting old laptops that no longer wanted from companies and households around the community, fix them for free, and lend them out to students in need. Professors who run their courses asynchronously or does not require attendance to their class flooded by students asking for additional enrollment to their already-fully-filled classes.

Universities then sent their faculty members an email asking them to be understanding of students’ situation, while leaving how far the understanding should go on the professors’ discretion. Many low-level mathematics courses in US universities are coordinated courses, where professors only have a bit of freedom to change the course contents. The same set of assignments and tests are given to all sections of the same course. Professors will then do what they are barely allowed to: extending assignments’ due dates, sometimes to the point that no

longer make sense. One example is in a course that normally has several daily time-sensitive components: pre-lecture assignment, in-lecture worksheets, post-lecture assignment. The pre-lecture assignment due before lecture start and got discussed during the lecture. The in-lecture worksheets due at the end of the lecture and got explained in the post-lecture assignment. Post-lecture assignment due before the next pre-lecture assignment made available. With distance learning, the professors are asked to be 'lenient' and set all those daily assignments to be due at the end of the week, or even be left open the whole semester. This is evidently a questionable practice since students ended up copying the provided explanations for each assignment and learn absolutely nothing.

Another obvious challenge in practicing distance learning is a dependable internet connection. Students who live in areas that is unprivileged of a good connection ends up swarming local library or going to campus to find public PC and free internet connection, which ironically contradict the original intention of practicing distance learning. This issue also often used as an excuse by few students every time they missed some assignments or did badly on exams. There is no way to prove or disprove when students claims that they lost their connection. Professors ended up being lenient by extending the due dates or give another chance on exam, even if those students were not telling the truth.

Another common accessibility issue is closely related with exams effectiveness during distance learning. Many universities in the US use third party online proctoring software to proctor their students' exams. To use this software, students need to have a webcam so that professors can later check the recording of the students taking the exam. Since professors must be lenient during distance learning, if some students cannot obtain a webcam, or calculatedly 'decided' that they cannot obtain one, then professors must excuse these students from being proctored or make a different version of the exam that is safe enough to be a taken home. There is no way to guarantee that students did these non-proctored exams themselves, or work on them without accessing all resources that otherwise be blocked by the proctoring software. This shows how the expected leniency to accommodate accessibility issues does not align well with the fairness of learning process.

3.2 Curving

A common question asked to math professors is about the existence of curving in their course. There are different ways on how curves are implemented, and some professors defined curving differently one another. Some refused to call it curving and defined whatever they did as grade shifting, averaging, cut offing, or any other fancy names that suits better with their definition. In short, compared to the official university grading scheme, students ended up getting more than they earned. For convenience, all these activities will be referred as 'curving' through the rest of this study. Curving is not something that only appeared after the pandemic forced classes to moved online. Many professors already implement curving on their in-person courses.

During distance learning, the curving become more intense, and students ended up getting way more than what they earned, causing them to struggle harder on the proceeding course. This is particularly concerning in lower-level mathematics courses. Students who pass Pre-Calculus only thanks to curving will only struggle more in Calculus I. If these students then pass Calculus I, also thanks to curving, they will struggle even more on Calculus II. At the end, some students will pass the whole Calculus series without mastering even half of the materials.

Why implement curving at all then? One common reason is to help students in borderline area to reach passing mark, especially if they are students who depends on financial aid that

will be revoked if they fail any class. However, the bigger reason might instead relate to the grade distribution. Universities typically have a record of grade distributions for each course. The example of this grade distribution is given on Table 1.

Table 1. Fall Course Average Percentages 2008-2016, based on the tables from University of South Carolina registrar office and datawarehouse.sc.edu. excluding honor classes

Course	A	B+	B	C+	C	D+	D	F	W	WF
College Math	25.83	12.17	17.32	9.27	12.34	3.25	5.82	8.76	4.41	0.29
Pre-Calculus	23.32	10.75	16.71	8.31	10.95	3.80	6.75	11.52	7.35	0.45
Calculus I	18.04	8.94	13.75	9.66	12.07	3.75	6.62	14.75	11.72	0.68
Calculus II	15.95	7.26	12.21	6.08	15.70	2.70	8.19	17.08	14.03	0.76

One of the objectives of these record is to see the DFW rate (percentage of students who received grade D, grade F, or Withdrawal) on a course. If a professor has a relatively higher DFW rate than these averages, then they will likely be assumed as 'doing a bad job', and this will highly impact their evaluation and consequently affect their RPT process. In some cases, the university or department even require the professors to grade on a curve so that students' grades will not deviate too much from these averages, no matter how students actually performed. For mathematics courses, the pressure of maintaining a relatively low DFW scores is heavier than other majors' courses since most US universities requires their students to pass certain number of mathematics courses before they can take their own major' courses.

As an illustration on how intense a curving can be during distance learning, Table 2 gives the grading schemes for Calculus I course on Spring 2021 semester at the University of Cincinnati. In a glance, many might think the curved scheme is too much, and will decrease the DFW rate by a huge amount. Even many professors agreed that above curving is far from ideal to maintain the quality of learning.

Table 2. Grading schemes on Calculus I course, Spring 2021, University of Cincinnati

Scheme	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Univ. original	94	90	87	84	80	77	74	70	67	64	61	<61
Curved	89	85	80	75	71	68	63	59	56	52	50	<50

However, there is also a need to look at what actually happened that caused the DFW rate to increase so much on distance learning, to the point that an intense curving is needed to satisfy the demand on maintaining similar grade distribution averages. Table 3 shows the grade distribution on my Calculus 1 sections on Spring 2021.

Table 3. Grading distribution on Calculus I course (section 001, 002, 101, 102), Spring 2021.

	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
#Students	4	2	3	2	6	11	10	11	4	4	1	14
percentage	5.56	2.78	4.17	2.78	8.33	15.28	13.89	15.28	5.56	5.56	1.39	19.44

Looking only at these numbers, my DF rate for this course is a whopping 31.95%. Adding eighteen withdrawals into the mix, I easily classify as an incredibly incompetent professor. However, what not being shown in that table is that 10 out of 14 students who received an F grade either did not take the final exam or missed at least one out of four midterm exams. Whether it was because they did not have sufficient devices, did not have decent internet connection, had jobs that they cannot afford to miss to feed their family, mourning for the loss of their family members, or got infected with COVID themselves, the

data did not consider them at all. Those numbers also are not showing that 12 out of 18 withdrawals were due to COVID-19 related issues. University policy requires official documentation for excused exams, but if students cannot provide those documents, then they will simply get zero on the missed exams.

One of my best performing students notified me that her whole family including herself got infected with COVID two weeks before the semester ended, and she never replied to my follow up emails ever since. Another student sent multiple alarming emails related to unsupportive parents and suicidal thoughts. On an instructor meeting, some colleagues shared that their students have similar stories. There are no special grades for F and W that caused by COVID, they are just F and W.

This shows how far COVID impacted the DFW rate on a course. It will be even worse if we consider how these issues impacted students' ability to perform well on their quizzes and homework. These components that cannot be recorded as data force the need of a more intense curving and understanding from professors. As unpredictable as they are, there is no way to have a clear image on how lenient professors can be on implementing a curve.

3.3 Alternative Grading

As much as professors are forced into a disadvantageous position for the unanticipated low DFW rate and nasty evaluations, students do not have it much easier. Most benefits and aids students depended on to continue their education are also hangs on the thin threads we called GPA. A study shows that providing students with information on their learning, rather their achievement, can encourage responsibility among students and give students powerful growth mindset messages about mathematics and learning that fill them with self-hope and belief [1].

However, no matter how professors tried to avoid assessing students by their achievement, it is still a fact that scholarships, financial aids, internship offers, job offers, graduate school enrollment, are all fierce competition grounds that aggravate students' desperation of maintaining a good GPA. In US higher education institutions, College Algebra has been acknowledged to be the worst GPA contributor with an estimated failure rate around 50% [5].

Calculus I is not much better with around 34.3% failure rate. There is the option to withdraw from a class (grade W) without affecting the GPA. However, the W grade will erase student participation record, and this is not working well for students whose financial aid eligibility based on the percentage of credit-hours successfully completed. One alternative offered is the option for P (proficient/pass) and NP (not proficient/not pass) instead of the traditional letter grades. There are different ways of implementing this alternative grading, but the big idea is the ability to change the passing scores (ABC range) into P and failing scores (DFW range) into NP.

When a student receives an NP grade, it has most of the same effect as a withdrawal, except without the hazard of forfeiting financial aid based on the participation. Some universities give students the option to choose between the traditional letter grades or P/NP grades. On average the changes are favorable toward students except for some exceptions. One exception is when a D grade is sufficient to meet someone's academic requirements while the NP grade is not. Another exception is that F-students might use NP to justify their failure and non-participation, and this is not fair towards the students who fail after completing all the works.

No thanks to these exceptions, universities are unable to implement the alternative grading for everyone and throw the decision into the professors' hand. At University of

Cincinnati's Department of Mathematical Sciences, for Fall 2021 professors are given the right to 'decide' whether an F-student deserve an NP grades. Like many previously discussed instances, there is no clear guide on how lenient professors can be in giving out NP grades. Professors got the short end of the stick here. F-students will see the university as an understanding entity who offer P/NP grades, and the professors as evil beings who enjoy ruining students' future by denying them those NP grades.

4 Conclusion

For over 14 months during the pandemic period, higher education in the US was in a high degree of uncertainty. Converting to distance learning comes with many technical, pedagogical, and institution management challenges. Both professors' and students' readiness to practice distance learning are important to overcome the challenges of distance learning. While many studies provide possible solutions to most challenges, there is no solution that can makes everyone happy. Professors needs to be more flexible and accommodating towards the students, which often can only be done by sacrificing their ideal teaching philosophy. Students need to be responsible towards themselves and reasonable towards the professors.

University and department must provide sharper guidelines on leniency levels and grading policy. Too much freedom thrown into professors' hand can caused misunderstanding, misinformation, and widespread of confusion, especially when communication is slower than ever. While teaching evaluation is a good way for professors to reflect on their teaching and obtaining feedback from their students, it should not be the major part on the RPT process, especially during COVID-19 pandemic where what being evaluated is mostly external factors that are not related to professors' performance.

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