Equity and LLMs in Computing Education: A gradeless perspective under well-being lens

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Abstract. *There are equity challenges in computing education when we realize that the digital divide expands itself due to the emergence of Large-Language Models (LLMs). Assessment is one of them, provoking computing educators to reflect on their day-to-day practice and reframing their perspectives about LLM use and their own assessment process. This provocative essay brings the gradeless approach as a possibility to deal with computing students' well-being and, as a consequence, equity in assessment involving LLM scenarios.*

1. Introduction

Large-Language Models (LLM) are powerful tools for expanding human capabilities in several tasks, including in educational scenarios [Freire et al. 2023]. However, LLMs can provoke educational inequities, comprehending Computing Education (CEd), and, consequently, affecting the well-being of computing students (and other stakeholders) negatively (even in educational data mining expressions [Bispo Jr. 2023]).

Assessment is a big challenge in educational research. Due to its control and certifying role, students usually have "mixed feelings" during the application of instruments like exams from a summative perspective [Luckesi 2012]. This situation is not different in CEd, affecting computing students' well-being negatively (beyond other stakeholders).

One way to improve the computing students' well-being in a macro-perspective is adopting the gradeless perspective. This approach can address some equity challenges that emerged from LLMs (Section 2) and mitigate these controversial feelings from assessment spaces. This is the main argument of this provocative essay (Section 3) and we will develop better as follows, winding up with the final remarks (Section 4).

2. Well-being, LLM Divide and Assessment

LLM divide [Bispo Jr. et al. 2024] is the gap between those with ready access to LLM tools (and the knowledge that they provide access to) and those without such access or skills. There are equity challenges in CEd, for instance, raised from multiple types of barriers like physical access, skill, attitudinal, and content dimensions. The authors highlighted the emergence of prompt literacy that has a broader commitment beyond prompt

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engineering, preparing students as citizens for a democratic society (and not only under a technicist lens).

LLM divide can be read in terms of well-being, properly theorized inside of the capabilities approach [Robeyns and Byskov 2023]. Understanding well-being as a common good that should be shared by all human beings is a concern of primary importance in this approach. Receiving a minimal CEd (e.g., computational thinking) can be desired as a common good in the information society. In this way, it is necessary to guarantee this "minimal common level", providing the real opportunity to be educated for all CEd community members [Bispo Jr. et al. 2022].

For instance, access to an LLM arises naturally as the first equity source. Once crossing the infrastructure barrier (a classical digital divide), we can face access barriers concerning the business model adopted by most private organizations. The "freemium"[1] business model allows users to freely have the first contact with an application through its basic features, needing to pay only when they want to use more advanced functionalities. This equity dilemma is two sides of the same coin. It is good because users do not pay (with money) for the access and use of an LLM, which is a means to pave the way for future and democratic access. In contrast, the simple fact of existing restricted access for a selected group of users promotes a divide between those with freemium access and everybody else. This is a structural problem of our society, and it is necessary to understand how to build a pedagogical environment that considers these aspects.

These well-being problems (present in inequality situations) are more severe because the educational assessment can serve as a tool for ranking students to be "absorbed by the labor market". The structural nature of the problem resides in the fact that capitalism provides the conditions for a LLM divide. This economic system defends the concept of a free market, encouraging all "players" to compete among themselves in pursuing profit maximization. Thus, in a competitiveness scenario, each player will look for what is called a competitive edge, aiming to be more attractive to their potential consumers. If computing students are "players" in this perspective, the CEd assessment plays a crucial role in their well-being surely (for better or worse).

3. Well-being and Gradeless

Assessment is a valuable part of the learning process that a teacher conducts to help them (both teacher and student) improve the students' learning route. It plays a range of roles that vary from diagnosing even to certifying the student's learning. Although its function is to promote student learning, there are "mixed feelings" when students need to face the reserved spaces (and moments) for exams, receiving, at the end of a summative cycle, a grade or even a letter concerning their learning performance.

Generally, students do not like to be reduced to a single number. In a general way, the need for a grade or a "concept" usually is a requirement of the school bureaucracy. There is an overload problem, as Philippe Perrenoud indicated [Perrenoud 1998], signaling two extremes of the same assessment axis: learning regulation *versus* excellence certification. It is not possible to have a full commitment to learning regulation without giving up, in a certain perspective, excellence certification. And the reverse is

[1]Freemium combines "free of charge" and "premium". See more in [Bapna et al. 2018].

also true. There is an antagonistic relation between these two assessment goals, leading to students strange the turning point, the exact moment when their formative teachers become themselves in summative and certifying teachers. We think it is the main source of these "mixed feelings".

This overemphasis on grades undermines student learning and negatively affects student well-being. This scenario is also present in CEd, being aggravated by the competitive personal curriculum vitae factory as mentioned. The lack of confidence in the teachers' role (Are they a partner in my learning journey? Or are they enemies of my success?) and the pressure to be a competitive and desired professional paves the way to the increase of student stress. Computing students may lose the will to learn in an environment like this. They can be tempted to deal with their learning journey in a pragmatic way, pursuing higher grades depending on how the teachers put the barriers to their success. Like an "intelligent agent" described by a good book on Artificial Intelligence, this environment catalyzes the rise of function maximizers, running, in a hurry and greedy way, to their best learning performance: the maximum grade.

The gradeless [McMorran et al. 2017] is an alternate form of assessment committed strongly to the learning regulation role instead of a certifying one. Assessment and learning without grades can create a promissory environment for authentic learning for computing students. The focus is to shift from a competitive to a collaborative worldview, conceding to students only pass/fail, credit/no credit, or strictly qualitative assessment (instead of grades). Implementing gradeless assessment can revolutionary the LLM use for learning purposes (in a formative way) and increase the computing students' well-being.

4. Final Remarks

This provocative essay brought the gradeless approach as a possibility to deal with computing students' well-being and, as a consequence, equity in assessment involving LLM scenarios. It is not simple to address all interweavings coming from the LLM emergence and the ambivalence from assessment in CEd. Surely, these provocations do not encompass all questions or answers about the subject. However, it is necessary to dare and shimmer pedagogical possibilities to "disturb" the current *status quo*, paving the way for new, disruptive, and critical perspectives. We, computing educators, need to dream of a joyful and vibrant classroom that promotes learning as its main goal [Guilherme and Freitas 2017, p. 12].

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Brief Academic Presentation

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