

A critical and comparative approach to improving university student assessment feedback through use of a formative digital platform.

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Introduction

Existentialist thinkers like Jean-Paul Sartre and Paulo Freire emphasize that the adult individual should assume responsibility for their own learning and intellectual growth (Sartre, J. P. 1946; Freire, P. 1970). Adapted to a university pedagogy context, continuous feedback between teacher and student is therefore a vital communicative process aimed at fostering both critical consciousness towards learning and adaptive, transformative action in both parties. Feedback can be either summative (assessment *of* learning) or formative (assessment *for* learning) (Adachi, C., Tai, J., & Dawson, P. 2018), but most student course feedback models are implemented a solely online summative approach. Online summative feedback surveys in general suffer from low response rates which can spur irregular responses and skewing of data (Morrison, K. 2013). Empirically, this is also our perception as teachers: summative-type feedback tends to motivate answers from a minority of students that, for often biased reasons, are dissatisfied with course content or have personal grudges against specific teachers and not the course content, while the silent, content majority generally will refrain from giving feedback again skewing feedback results (Bob Uttl, et al., Vol 54 p. 22-42). Furthermore, this approach more often than not, under the protective guise of anonymity, fosters comments containing irrelevant personal attacks on teachers and even the occasional borderline death threat. As teachers and courses are continuously assessed based upon student feedback a closer look at reworking this format may be quite warranted and long overdue. The aim of this project is an attempt to:

- Introduce an additive component to traditional summative student assessment feedback design through implementing a platform for in-class formative feedback.
- To compare and evaluate consistency in student rating of course learning elements midway opposed to at the end of a course.

The benefit of optimizing student assessment is, at the very least, two-pronged. In this case, by including a formative student assessment format, in addendum to the summative end point, the students themselves gain from their own feedback by being active participants in shaping the course and their own learning experience by giving teachers the opportunity to directly gauge aspects of teaching that can be modified to increase congruence in teaching-learning outcomes.

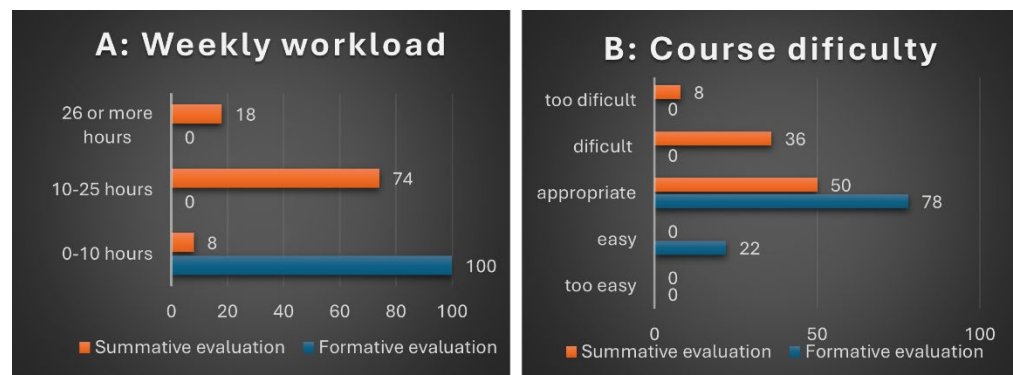
The chosen course for this intervention, *basic human physiology*, is an obligatory bachelor course in 1st year Biology on Faculty of Science, KU. The course this year has an attendance of 155 students and is designed as a combination of classical mass lectures, theoretical classes with group activities focused on exam relevant questions, and a number of practical classes designed to actively apply the theoretical knowledge students acquire through reading and lectures. As of now the only feedback from students is given at the end of the course as an anonymous evaluation questionnaire. While anonymous criticism can be helpful in post course dissemination, this only carries over to the subsequent course and does not benefit the students giving the actual feedback. A number of problems arise with the current assessment format: The field of Biology is very broad, containing an inordinate number of distinct niches, and therefore the obligatory bachelor courses usually is composed of a conglomerate of highly heterogenous students. Some are only interested in the lifecycle of the Stinkhorn fungus, while others want to dedicate their lives to saving coral reefs or decoding blue whale song. This poses a challenge for the teacher on a course teaching human physiology and successfully implementing learning outcomes in such a classroom setting can at times be a true Herculean task. Therefore in-class student assessment feedback tools could hold valuable potential in aligning teacher-student learning activities in an optimal way.

Methodology

To implement the in-class formative assessment (FE) feedback the digital platform tool Mentimeter (Mentimeter.com) was utilized to design evaluation poles regarding the course. The app allows ease of access and use through the students' phones and gives the teacher the possibility of designing a wide variety of polls with possibilities of both multiple-choice answers and open-ended questions inviting more elaborate answers. As the course was only in the fourth week of its 7-week schedule, in discussion with the departmental supervisor the choice was made to focus on the view on congruence of the course and the burden of work as perceived by the student; parameters that could directly be aligned and compared to the summative feedback (SE) survey. In order to determine whether a certain segment of students was prone to answer the feedback poll, a series of questions were devised to gain anthropometric data on the students. Self-assessment of how much time and effort they put in the course was also implemented to give an angle on to what extent the students were actually putting the adequate workload as expected for the course, a quite important factor, as students not applying themselves will often find the course hard to follow leading to negative feedback. The Mentimeter poll was implemented in two practical classes consisting of 25-30 students each, where students, multiple times, were encouraged, but not forced, to complete the survey.

Results

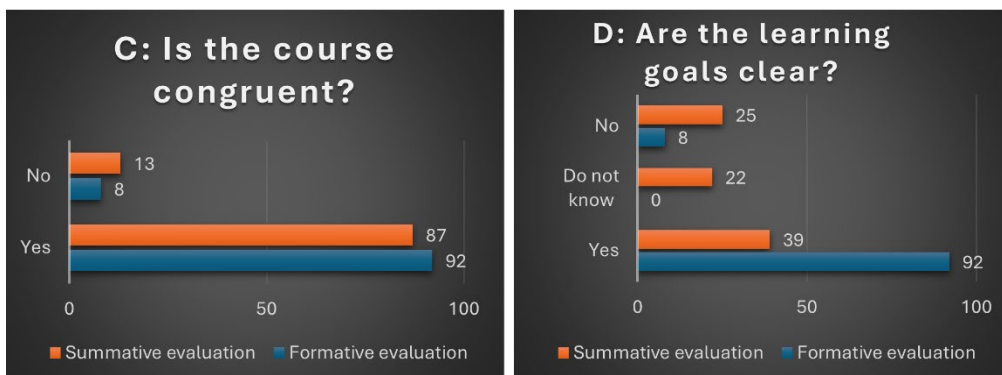
Surprisingly, even though the summative survey was designed to be easily accessible, short, and concise, only a relatively low number of students completed the answers. Only 21, amounting to 38% of the 54



students exposed to the survey. This despite being reminded and given ample time to do so in-class. Most questions were designed as open-ended to gather further constructive information, but students mainly replied with a yes or no answer. Interestingly, the students completing the formative survey were almost exclusive male, ages 20-30. As previously stated, we experience a high general disinterest among students to complete summative evaluations. In order to increase answer rates in the summative evaluation students sternly and continuously asked to complete the feedback survey and told that they would, as a bluff, not get an exam question session (usually provided in the exam week) if 50% completed the survey. 49%, adding up to 76 students out of 155, ended up completing the summative evaluation survey.

Students were asked how many work hours they put in preparation and following teaching for the course on a weekly basis (A). Already here a surprising discrepancy was found between the two surveys. FE showed 100% of the used less than 10 hours a week, while SE showed 92% of the students spent 10 hours or more a week. This could be due to the fact that SE is at the very latter part of the course, close to the exam week and therefore students will tend to allocate more time here for reading and exam preparation forgetting that they do less in the prior weeks of the course.

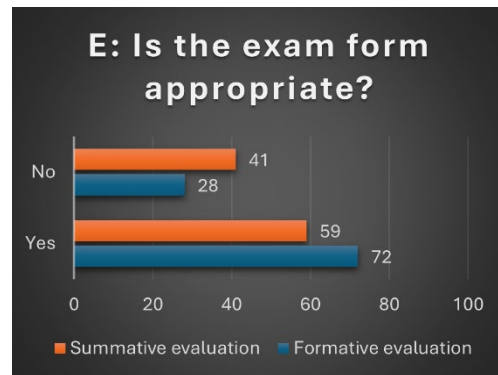
When probed about perceived difficulty of the course (B). Here, again, a large difference was apparent as FE reported difficulty ranging from easy (22%) to mostly appropriate (78%), whereas SE reported difficulty from appropriate (50%) to difficult (36%) and too difficult (8%). This result indicates a stark change in how students perceive their own level midway through and at the end of the course. The teachers' interaction with the students is generally the same between the period of



the two surveys so this discrepancy cannot be attributed to a change in style of teaching.

There was a high similarity between surveys when students were asked about congruence in the course (C) where most (FE 92%, SE 87%) found a high degree of alignment between the course components.

However, this was not reflected in the response to whether learning goals, as formulated in the course description, were clear and logical (D). FE reported 92% yes whereas SE reported only 39% yes, 22% do not know, and 25% no to understanding the goals, indicating that students rather puzzling lost perception of what the learning goals were between halfway and the end of the course.



Finally, when asked about satisfaction with the course exam form (E) FE reported 72% yes and 28% no, while SE reported 59% and 41% no, respectively. Personal preference for exam form can be very diverse but the digression towards a higher dissatisfaction rate in the SE might be interpreted as frustration/ stress closer to the exam.

Discussion

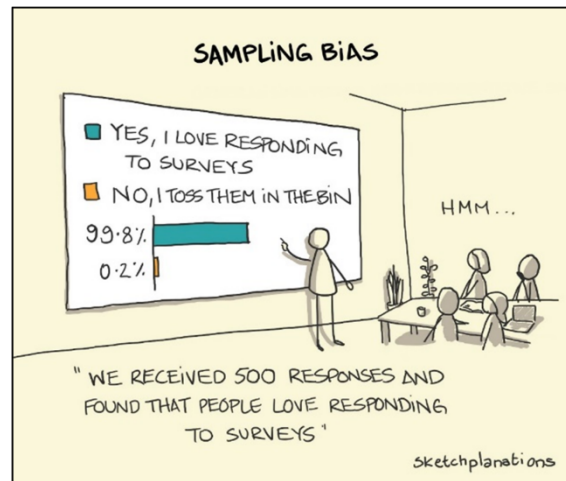
Based on data, it seems quite evident that there are huge differences in results dependent on the timing of introducing feedback surveys to students on a given course, and there could be a case in point of combining formative and summative type feedback surveys to negate weaknesses in both types of student assessment. Furthermore, given that courses, and teachers individually, are administratively assessed by use

of the feedback model, there is fairly strong argument that they should be made obligatory in order to get a data foundation.

In terms of FE, although this present attempt was more of a trial and error experiment, it appears that when the tool is easily accessible and the teaching experience is fresh in mind, it yields a far more positive response in all parameters of feedback assessment. The mid-way feedback tested here can also give the teaching staff the possibility of tweaking minor issues to the benefit of the students, which is really a win-win. If designed with diligence it holds good potential for supplementing student feedback in a very constructive way. A drawback is of course, in this case that the students haven't experienced the full course and therefore lack the full spectrum of the course experience. It is obvious that the sample size of the present FE is far lower than that of the SE and therefore it is not the same people completing the surveys; this could account for some of the discrepancies. With that in mind, it is cause for concern that feedback on some more static aspects, like learning goals and exam forms, change so much from mid- to end of course which would imply that students are not adequately aware of these parameters. This also begs the question: is the average student even sufficiently qualified to give proper assessment feedback? Several studies imply that student feedback should mostly be considered as perception data and not actual evaluation of faculty staff (Angela R. Linse, 2017; Ang, L., et. al, 2018). To this effect, meta-studies have found heavy bias in student feedback methods leading to the conclusion that student feedback and student learning in university courses are in fact mostly unrelated (Bob Utzl, et al., Vol 54 p. 22-42; Spooren, P., et. al, 2013). This is harshly recognized in the fact that parameters irrelevant to teaching quality, such as teacher body language, gender, ethnicity, attractiveness, and even weather conditions have been shown to significantly influence student feedback rating (Roxå, T., et al, 2022). There is therefore some inherent risk in allowing student evaluation to weigh heavily in assessing teaching quality. These parameters are of course beyond the scope of this project but again emphasizes the need to rework current summative feedback models.

In conclusion, implementing a formative feedback component in the classroom may have the potential to produce more constructive,

usable assessment to complement the current summative approach where the student has no gain, nothing at stake, and therefore little motivation to complete a questionnaire. In principle the formative platform can be implemented at the end of all classes to, be highly specifically designed to probe distinct teaching elements, and yield instant information on how effectively learning was reached on that given occasion, better interpret, and readjust for following classes. The earlier introduction to giving feedback can also give the students an opportunity to start reflecting more on teaching-learning aspects to the benefit of the summative assessment.



The obvious dangers of survey confirmation biases (10).

Picture source: Sketchplanation.com

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Appendix

COURSE DESCRIPTION

University of Copenhagen - Courses

NBIA04035U Menneskets fysiologi (Fysiologi)

Årgang 2023/2024

FOLD ALLE IND

Engelsk titel Human Physiology (Fysiologi)

Uddannelse

Bacheloruddannelsen i biologi

Kandidatuddannelsen i bioteknologi med sidefag

Kursusindhold

En forelæsning vil give et overblik over et fysiologisk emne, som eksempel: nerver, muskler, sanser, respiration, energistofskifte, hormoner, fordøjelse og nyrer. Der lægges vægt på samspillet mellem de forskellige dele af fysiologien. Disse emner behandles yderligere ved øvelserne. En øvelse kan være enten en laboratorieøvelse eller gruppetimer efterfulgt af en mundtlig fremlæggelse.

Målbeskrivelser

Kendskab til menneskets fysiologi har stor betydning for den enkelte og for samfundet. Kurset sigter mod en forståelse af menneskekroppens funktioner i samspil med omgivelserne. Den ønskede forståelse bygger på viden om de biokemiske og fysiske processer, der indgår i de mange former for reguleret samspil, som finder sted på celleplan, på organplan og i hele organismen. Både dagligdagens forhold og ekstreme situationer (ekstraordinær belastning, sygdom) bruges til at belyse funktionerne.

Viden: Den studerende kan gøre rede for menneskelegemets opbygning og funktion af de enkelte organer. Den studerende har viden om og indsigt i samspillet mellem menneskekroppens enkelte dele og med omgivelserne. Den ønskede forståelse bygger på viden om de biokemiske og fysiske processer, der indgår i de mange former for reguleret samspil, som finder sted på celleplan, organplan og i hele organismer.

Færdigheder: Den studerende er i stand til at udføre simple fysiologiske relevante beregninger og gøre rede for et fysiologisk procesforløb (fx. en figur fra en lærebog eller en videnskabelig artikel).

Kompetencer: Den studerende er i stand til at anvende den basale viden om fysiologi til at forklare fysiologiske mekanismer i mennesket fx ved faste og fødeindtag, i hvile og under fysisk aktivitet samt relateret til sygdom.

Undervisningsform

Undervisningen består af en kombination af forelæsninger (alle deltagere) og øvelsestimer (mindre hold á 20-30 studerende). Øvelsestimerne omfatter laboratorieøvelser og opgavetimer (opgaver med fokus på fysiologiske spørgsmål inklusiv gamle eksamensopgaver).

COURSE EVALUATION CRITERIA:

Definition og kategorisering af kurser i A-, B- og C-kategori

Kategori A:

Kurser hvor undervisningen har fungeret særligt godt og kan være til inspiration for andre.

Kategori B: Kurser, hvor undervisningen har fungeret tilfredsstillende. Evalueringen giver anledning tilingen eller mindre justeringer af kurset.

Kategori C: Kurser, hvor evalueringen giver anledning til justering og udvikling af kurset og/eller undervisningens form og/eller indhold.

Udgangspunkt for kategorisering er et kvantitativt mål baseret på besvarelse af de otte spørgsmål i evalueringsskema for undervisning. Hvis blot ét af kriterierne nedenfor er opfyldt, placeres kurset som udgangspunkt i kategori C.

Resultat af den kvalitative del af evaluering af undervisning, resultat af evaluering af eksamen samt resultat af underviserevalueringen inddrages herudover i den kvalitative vurdering af kategorisering af et kursus. Behandling i instituttets undervisningsudvalg med inddragelse af dette samt supplerende oplysninger om kurset kan give anledning til, at kurset flyttes til kategori B.

Gældende for spørgsmål 3, 6 og 8 er, at de især måler de studerendes udbytte af kurset. Undervisningsudvalget skal derfor have skærpet opmærksomhed på kurser, der slår ud på disse tre spørgsmål. Hvis et kursus, der har slået ud på disse tre spørgsmål, efter undervisningsudvalgets behandling ikke længere placeres i kategori C, skal der i den interne del af evalueringsrapporten angives en særlig begrundelse herfor.

Det skal fremgå af den skriftlige feedback til underviseren, hvorfor et givent kursus placeres i en specifik kategori. Hvis ingen af kriterierne nedenfor er opfyldt, placeres kurset i kategori A eller B.

Et kursus placeres som udgangspunkt i kategori C, hvis blot ét af følgende kriterier er opfyldt:

Spørgsmål

Kriterier

Spørgsmål 1+2:

Flere end 30 % svarer i laveste kategori, eller flere end 30 % svarer i højeste kategori.

Spørgsmål 3:

Flere end 30 % svarer i laveste kategori, eller flere end 30 % svarer i højeste kategori.

Spørgsmål 4:

Flere end 30 % svarer i laveste kategori, eller flere end 30 % svarer i højeste kategori.

Spørgsmål 5:

Flere end 30 % svarer i de to laveste kategorier.

Spørgsmål 6:

Flere end 30 % svarer i de to laveste kategorier.

Spørgsmål 7:

Flere end 30 % svarer i de to laveste kategorier.

Spørgsmål 8:

Flere end 30 % svarer i de to laveste kategorier.

Spørgsmål 9:

Flere end 30 % svarer i de to laveste kategorier.

Spørgsmål 10:

Flere end 30 % svarer i de to laveste kategorier.

Dumpeprocent:

Hvis flere end 30 % af de fremmødte til eksamen dumper.

For kurser hvor færre end 25 % af de studerende, der går til eksamen i kurset, har udfyldt evalueringsskemaet, skal undervisningsudvalget have øget opmærksomhed på evalueringsnotatet fra den kursusansvarlige.

Den kursusansvarlige skal i evalueringsnotatet inkludere en vurdering af, hvad der kan ligge til grund for den lave svarprocent. Der skal ligeledes inkluderes en vurdering af, hvorvidt kurset lever op til den fastsatte målsætning og de studerendes generelle tilfredshed med kurset, idet data på baggrund af evalueringer ikke er tilstrækkeligt.