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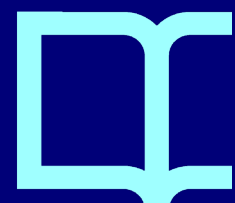
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## **Prior experience with online feedback: its influence on student's engagement**

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## **Prior experience with online feedback: its influence on student's engagement**

Although the literature on feedback processes has identified two approaches to feedback: more transmissive or more dialogical, there is little empirical evidence of how students perceive feedback practices, particularly in online education. Moreover, there is a lack of research addressing previous experience with online feedback (frequency, timing, type of feedback and the opportunity to resubmit their work) and how this influences student engagement. To provide evidence regarding these issues, an online questionnaire was answered by 1,766 bachelor students. Results suggested that students tend to perceive feedback practices as resembling the transmissive model. Even so, the results confirmed that students' prior experience with online feedback influences their degree of cognitive engagement with it. The discussion of this article focuses on the importance of carrying out dialogical feedback practices in online education, as well as demonstrating why it is important to purposefully design feedback, at both instructional and institutional levels.

Keywords: feedback; online education; prior experience; engagement

### **Introduction**

The framework of this paper is based on the teaching and learning processes that take place in online environments. From a sociocultural and constructivist perspective, “learning is believed to develop historically through changes at the sociocultural level that are intertwined with the development of the individual” (Esterhazy, 2019, p. 70). This relationship between context and the individual has been established through the necessary interaction that occurs in formal learning activities between teachers and students—and among students themselves—to construct knowledge (Mercer & Howe, 2012; Shrestha, 2020; Wertsch, 1985). Under the socio-constructivist perspective, this knowledge is built on prior experiences, knowledge, and beliefs (Hattie & Gan, 2011). In an online teaching and learning environment, this interaction between teacher and student can be asynchronous and mediated by technology and written communication, as is the

case of the online environment for the research outlined in this paper. In this context specifically, feedback processes have been identified as necessary support to promote learning (Gibbs & Simpson, 2005; Gikandi et al., 2011;

Wang, 2022). Despite the importance of feedback, students do not use or take advantage of it to improve their learning; that is, they do not engage with the feedback they receive. Feedback engagement studies have focused on exploring strategies to promote such engagement, but there is little evidence looking at students' prior experience as a key factor. This research provides evidence concerning the effectiveness of the preengagement stage and what relationship this may have with students' cognitive engagement with feedback.

### ***Online feedback***

Research has reached consensus on two approaches regarding the conceptualization of feedback (Winstone, Boud, et al., 2021). The first is a more transmissive, one-way approach where feedback is equivalent to the information that the student needs to learn. According to Winstone and Carless (2019), this is the old paradigm. In the second approach, feedback is procedural, dialogical, and multidirectional (new paradigm). In this paper, we focused on this second approach to feedback, according to the dialogical feedback model proposed by Boud and Molloy (2013). From this model, we understand that feedback is not static and may not make sense at any given time. We have taken into consideration that feedback evolves and can influence the learning process in different ways (Ajjawi & Boud, 2017). According to Carless (2019a), this evolution creates a feedback spiral: "learning is conceived as a series of cycles building on student engagement with previous feedback experiences and facilitating continuously more sophisticated starting-points" (p. 713). To promote learning, feedback practices resembling the dialogical approach must be pursued (Steen-Utheim & Wittek, 2017). In the specific context of online learning, an educational model which is based mainly on asynchronous and written communication, dialogic feedback should integrate self-reflection questions and suggestions (epistemic and suggestive feedback) in order to promote self-regulated learning (Gibbs & Simpson, 2005). In addition, due to the asynchronous nature of online learning, the design of dialogic feedback practices should include several points at which students can demonstrate how they are implementing the feedback they have received (e.g., giving them the opportunity to submit a draft before

turning in the final version of the assignment). Although the literature seems to be in agreement regarding how dialogic feedback practices should be, there is little empirical evidence demonstrating whether students actually perceive feedback practices in that way (Jensen et al., 2021). This paper aims to offer such empirical evidence and thus shed light on how feedback practices are actually perceived by students.

The approach to feedback as both a process and a dialogue requires students to adopt an active role in the learning process and in the processing of feedback (Van der Kleij et al., 2019). However, this rarely happens, and students fail to take advantage of the feedback they receive (Winstone et al., 2017). A number of studies have focused on engagement and ways to encourage students to interact with feedback (see Winstone et al., 2017 for a systematic review). However, there is little research on the preengagement stage, that is, on the willingness of students to engage with feedback (readiness to engage).

### ***Online engagement and feedback***

Numerous studies have discussed engagement in virtual environments (e.g., Brown et al., 2020; Winstone, Bourne et al., 2021), and many have explored the use of technology to engage (see Hepplestone et al., 2011 for a literature review on this topic). However, empirical research is still needed to better understand what practices must be promoted to ensure that this engagement occurs (Czerkawski & Lyman, 2016). To understand engagement, we turned to the model developed by Fredricks et al. (2004) based on a review of 44 studies focusing on the concept of engagement and its strengths, weaknesses, and gaps. Given its extensive nature, this model may serve as a benchmark for engagement research, which is why we used it here as our primary point of reference. As such, we have conceptualized student engagement as a multidimensional construct that integrates three dimensions: behavioral, affective, and cognitive (see Figure 1).

Based on Fredricks et al.'s (2004) model, we understand behavioral engagement with feedback in virtual environments as students' actions or behaviors toward it. This included reading feedback upon receiving it, asking the teacher and classmates questions about it, and ultimately using it. Behavioral engagement with feedback is necessary but not sufficient on its own for feedback to fulfill its regulatory function of learning. For example, students can read feedback without understanding it or using it, so they may be behaviorally but not cognitively engaged.

To characterize cognitive engagement with feedback, we again referred to Fredricks et al. (2004), who defined it as being strategic or self-regulating. Strategic

students use metacognitive skills to plan, monitor, and evaluate their cognition when they are performing tasks (Pintrich & De Groot, 1990; Zimmerman, 1990, as cited in Fredricks et al., 2004). According to Hadwin et al. (2019), students who self-regulate their learning carry out an active and intentional process through which they metacognitively monitor, evaluate, and control their behavior, cognition, motivation, and emotions while striving to learn. In this context, we understand students' cognitive engagement with feedback as their use of external regulation (in this case, feedback) to ascertain how well they have understood the assignment and to plan, monitor, and evaluate their cognition in relation to the suggestions for improving their work.

Analyzing students' emotional engagement in relation to feedback helps to understand students' affective reactions to it and subsequent changes, if any. Fredricks et al. (2004) defined this dimension as positive and negative reactions to people who are involved in an education activity (i.e., teachers, peers, and academics). We have also conceptualized this dimension according to Pekrun (2006) and the control-value theory of achievement emotions. In this theory, Pekrun regarded feedback as one of the contextual factors influencing students' emotions. We will not elaborate more on this aspect, as it is not the focus of this paper. However, we do highlight the importance it has in relation to engagement with feedback and the need for students to have skills to manage the emotional impact of feedback so that they can genuinely engage with it.

The body of research on how to engage with feedback has grown rapidly and placed the focus on how engagement is characterized (Tai et al., 2019) and on how to encourage students to use the feedback they receive (Winstone et al., 2017; Zhang & Hyland, 2022). However, there is little research on the stage prior to engagement, that is, the willingness of students to engage with feedback (readiness to engage). This stage is essential because the teaching process can directly influence it, either encouraging or discouraging improvements in engagement and learning.

### ***Students' prior experience and engagement with online feedback***

Following the dialogical approach to feedback previously mentioned and based on Guasch and Espasa's (2015) definition, in this paper online dialogical feedback is understood as a four-stage process involving (a) the design of feedback, (b) its processing and understanding, (c) its implementation, and (d) planning opportunities for students to review and resubmit their assignments. This paper focused on the last two stages of this

cyclical process: analyses of students' tendencies to implement feedback or engage with it and the role that prior experience has in relation to online feedback.

Along with our theoretical perspective, and from Crisp and Bonk's (2018) approach, we analyzed students' prior experience through four properties: the type of feedback received, the point in the learning process at which they received it, how often it was received, and whether they were given the chance to revise their work. Each of these properties can influence how students engage cognitively with the feedback.

Concerning the aspects that influence engagement, in a recent study, Vattøy et al. (2021) analyzed the quantity of feedback, the quality of engagement with feedback, and the agency over feedback. They concluded that there is an association between the quantity of feedback, its quality, and its use. They also found that the quantity of feedback mediates the relationship between the use of feedback and the quality of feedback. That is to say, the amount of feedback received directly influences the quality of the feedback (more quantity of feedback is perceived by students as more quality of feedback).

Going back to the preengagement stage, Carless's (2019b) 3P model is of great importance. This model took the foundations of the teaching and learning model by Biggs (1993, 1999, as cited in Carless, 2019b) and adapted and contextualized it to fit within the experience of feedback. The model identified three stages: presage, process, and product. We have focused mainly on the presage stage. According to Carless (2019b), this stage encompasses learner factors and the teaching context. In relation to learner factors, it includes previous experience with feedback, the competencies they have to engage with feedback, and the motivation to use the feedback to improve. Teaching context refers to course design, teaching inputs, learning activities and assessment design (p. 53).

The preengagement stage has been labeled readiness to engage by Handley et al. (2011). According to Handley et al., the willingness of students to engage with feedback is influenced by multiple factors, including prior experience in similar tasks, prior experience in relation to feedback, the authenticity and perceived usefulness of the task, the interest that the task arouses, the point at which they usually receive feedback, expectations for student success, the knowledge and skills to understand the feedback received, the perception of the task as their own or as imposed, and the goals pursued.

Readiness to engage is complemented by active engagement, which, according to Handley et al., is the action (visible or otherwise) that students take based on the feedback they receive.

In general, students' prior experience with feedback has been an important factor to consider when analyzing their likelihood of engaging with feedback (Malecka et al. 2022). In light of the aforementioned contributions, we understand prior experience with feedback in online environments (prior online feedback experience) as the set of actions, behaviors, and feelings that students display in relation to feedback.

Although the experiences students have in relation to feedback influence how they engage with it (Carless, 2019b; Handley et al., 2011; Pitt, 2017), few studies have contributed empirical evidence. Robinson et al. (2013) carried out a study in which they explored why first-year students at a university were not satisfied with feedback. One of the influencing factors was their prior experience with feedback, in this case outside the university sphere. Robinson et al. attributed this result to the students' lack of competencies to engage with feedback. This relationship between prior experience with feedback and engagement has been researched even less in the context of teaching and learning in online environments (Winstone, Bourne, et al., 2021).

Within the framework of teaching and learning in online environments, this paper aims, first, to characterize online feedback in order to find out whether feedback practices are perceived by students as being closer to a transmissive or dialogical model, and secondly, to ascertain whether students' prior experience with feedback (whether it is perceived by them as more transmissive or more dialogical) influences how they cognitively engage with it.

## **2. Research questions**

Based on the gap in the literature and the theoretical framework outlined above, this paper sought to answer two general research questions:

- (1) How are online feedback practices being used in teaching and learning in virtual environments?
- (2) Is there a relationship between students' prior experience with online feedback and their cognitive engagement?



To answer these questions, we examined four aspects: how often students have received feedback online, the type of feedback received (corrective, epistemic, or suggestive), the point in the process at which it was received (before submitting the assignment, at the time of submission, or after the assignment has been submitted and corrected), and whether or not the opportunity was given to revise the assignment with the feedback in mind. In accordance with Crisp and Bonk (2018), we chose these aspects for analysis over others because they are consistent with the current interest in student engagement with feedback and, therefore, enable students to become active agents within the process of feedback and learning.

## **Method**

This research was part of a broader research project, I þ D: Engaging students with feedback for learning in online environments (ON-Feed) funded by the Spanish Ministry of Science, Innovation and Universities (PGC2018-098552-B-I00). The purpose was to analyze student engagement with feedback and compare different feedback strategies to gain insight into their impact on engagement. The general approach that we adopted in the project involved analyzing students' level of engagement with feedback from three dimensions identified in the literature: cognitive, behavioral, and affective. However, in this paper, we have focused on the evidence obtained from the perception of students in relation to the cognitive dimension, which is a complex dimension, for which a separate study and analysis are needed (Zhang & Hyland, 2022).

We undertook the study at an online university, the Universitat Oberta de Catalunya (UOC), which offers undergraduate and graduate degrees. Given its history and size (it has approximately 37,384 undergraduate students), the UOC can be considered a representative case of a large online university. The university's educational model is primarily asynchronous and based on written communication. The teaching and learning process takes place on a virtual campus, which is represented through the design of assignments (e.g., problem-based learning, case studies, debates) that are completed throughout each semester. Interaction between teachers and students is necessary in order to collaboratively build knowledge.

This research met all the ethical criteria implemented in social sciences. The project in which this study took place was approved by the UOC's Ethics Committee.

### ***Sample***

he results were based on an online survey administered at the UOC, with a total sample size of 1,766 bachelor degree students in several programs, allowing for a global error of  $\pm 2.32$ , (CI: 95.5%). The students responded to an open invitation to participate in the study; they were not asked for any personal data and were assured the information collected was only used for research purposes. The students had been studying at the UOC for an average of 4.16 semesters. However, the individual time spent there varied greatly among the students (SD = 2.819), with some in their first semester (0 semesters in the UOC) and some who had been studying there for more than 10 semesters (5 years or more). Only students who had been studying at the UOC for at least 1 semester were selected to be asked about their prior experience with feedback in the online university environment.

### ***Materials***

We collected data for this research from a questionnaire that was administered online at the end of the semester (March 2020). We designed the questionnaire with items validated from existing questionnaires and adapted to the context (online) and specific topic (feedback). We performed an internal validation process with 7 expert judges, and a pilot test with three students that we interviewed individually after answering the questionnaire.

The final questionnaire had six sections: Section 1 asked about the students' reasons for pursuing their university degree; Section 2 asked about reasons and expectations in relation to a specific subject/course; Section 3 asked about prior experience in relation to feedback; Section 4 asked about behavioral, emotional, and cognitive engagement; Section 5 contained the questions related to feedback literacy; and Section 6 invited students to add any reflections they considered pertinent.

The research focused on the students' responses to Sections 3 and 4. Regarding the cognitive engagement questions (Section 4), we used the definition of cognitive engagement by Fredricks et al. (2004) and Fredricks et al. (2016).

### ***Data analysis and operationalization of variables***

We analyzed data using univariate and bivariate descriptive statistics producing basic descriptors as means and standard deviations as well as position analysis (quartiles) and bivariate inferential statistics. Before the hypothesis contrast was addressed, the

Kolmogorov-Smirnov normality test was performed. As it came out positive, despite the sample size and other normal assumptions, the Mann-Whitney and Kruskal-Wallis tests were used according to the related variables for the hypothesis contrasts. The statistical analysis was created using SPSS 21. To make it easier to interpret the results of this research, the means and standard deviations are provided.

In order to further examine students' online feedback experience, we asked them about their perception of feedback in the subjects they had previously taken online. We examined this variable through four properties:

- How often feedback was received (frequency): never, occasionally, most of the time, or always.
- Type of feedback: whether it was more corrective or informative, more epistemic (based on questions), or more suggestive (epistemic and suggestive feedback are considered elaborative types of feedback) (Alvarez et al., 2012; Bangert-Drowns et al., 1991; Mason & Brunning, 2001; Narciss et al., 2007).
- Timing: whether they had received feedback while working on the assignment, upon submission as a form of correction, or after the assignment was already assessed and graded.
- Possibility of revision: whether they had the opportunity to make improvements to the assignment once they saw their grade and received feedback, and then resubmit the assignment.

The other variable we examined was cognitive engagement. According to the theoretical approach described above, which defined cognitive engagement in terms of being a strategic student, there are five levels of cognitive engagement (from lowest to highest): (1) students do not use the feedback, (2) students read the feedback, (3) students understand the feedback, (4) students identify positive aspects and aspects that should be improved in the assignment, and (5) students cognitively engage to regulate task performance (Table 1).

INSERT TABLE 1 HERE

## **Results**

We present the results in response to the two research questions. For each of the four prior experience properties (frequency, type of feedback, timing, and possibility of revision),

we first present a description, followed by the results regarding its relationship with cognitive engagement.

We divided the students in the study in regard to the reported frequency with which they perceived receiving feedback: 50.9% said they received feedback most of the time or always, while 40.5% claimed to never or occasionally have received feedback.

The results revealed a statistically significant relationship between students' perception of how often they received feedback in the past and their cognitive engagement (see Figure 2 and Table 2).

INSERT FIGURE 2 HERE

INSERT TABLE 2 HERE

Indeed, the higher the frequency of feedback received, the greater the cognitive engagement. Specifically, the results showed higher levels of understanding ( $X^2(2, N = 1,587) = 57,343, p < 0.01$ ), identification of positive aspects and aspects to be improved ( $X^2(2, N = 1,587) = 14,592, p < 0.01$ ), and cognitive regulation of task performance ( $X^2(2, N = 1,587) = 51,973, p < 0.01$ ). The same did not hold true for reading feedback, however.

Particularly, there was a significant relationship showing that the students who claimed to have always received feedback were also those who declared having higher levels of understanding of feedback ( $M = 5.83; SD = 1.040$ ), identification of positive aspects and areas of improvement ( $M = 5.05; SD = 1.534$ ) and regulation of performance of the task ( $M = 5.18; SD = 1.499$ ).

As for type of feedback, most students (73.8%) said they had received a lot or sufficient corrective feedback, while fewer than half (43%) reported receiving a lot or sufficient epistemic feedback. This percentage was even less for suggestive feedback (36.6%).

Feedback that was more epistemic and/or suggestive implied a higher level of cognitive engagement. There was also a higher level of cognitive engagement if there was a large amount of corrective feedback, since the frequency.

INSERT FIGURE 3 HERE

INSERT TABLE 3 HERE

Students who reported having received feedback with a lot or sufficient corrective content showed significantly higher levels of understanding ( $z = -5.304; p < 0.01$ ), identification

( $z = -2.993$ ;  $p = .003$ ) and regulation ( $z = -2.413$ ;  $p = .016$ ). However, this did not affect reading levels.

When students perceived that the feedback had a lot or sufficient epistemic content, the same occurs, but in this case there was a bigger distance between their levels of understanding, identification, and regulation compared with the students who had received less or no epistemic feedback [understanding ( $z = -7.491$ ;  $p < 0.01$ ), identification ( $z = -6.558$ ;  $p < 0.01$ ), and regulation ( $z = -7.708$ ;  $p < 0.01$ )].

As above, the same happened when students perceived a lot or quite a lot of suggestive content understanding ( $z = -7.210$ ;  $p < 0.01$ ), identification ( $z = -5.844$ ;  $p < 0.01$ ) and regulation ( $z = -5.347$ ;  $p < 0.01$ ). In addition, there was a higher rate of reading the feedback when students said they had received more feedback with epistemic content ( $z = -3.258$ ;  $p = .001$ ) or if there was more suggestive content ( $z = -2.118$ ;  $p = .034$ ).

As for timing, the vast majority of students (90.1%) said that they have rarely received feedback on tasks before submitting them. It was also uncommon for them to receive feedback such as an answer key or automatic feedback immediately after submission, with 83.3% reporting that this had never happened or had happened only occasionally. Moreover, 73.9% of students revealed that the feedback they received in the past was usually given once the assignment was assessed. In other words, they received summative feedback, meaning they could no longer implement it to improve the assignment, except in the case of formative assessment design. The few students who received feedback while completing the assignment showed significantly higher levels of cognitive engagement with feedback. This was demonstrated through a higher tendency to read it ( $z = -4.408$ ;  $p < 0.01$ ), a higher level of understanding ( $z = -5.063$ ;  $p < 0.01$ ), a stronger ability to identify the strengths and areas for improvement ( $z = -6.933$ ;  $p < 0.01$ ), and better cognitive regulation of task performance ( $z = -7.445$ ;  $p < 0.01$ ). This also occurred when feedback was consistently received after submitting it, or once the assignment was corrected and assessed (see Figure 4 and Table 4).

INSERT FIGURE 4 HERE

INSERT TABLE 4 HERE

Finally, only 18.6% of students reported being able to revise their assignment based on the feedback received. However, experiencing this feedback strategy in the past created a prominent positive impact on students' cognitive engagement: they presented better reading levels ( $z = -2.099$ ;  $p = .036$ ), understanding ( $z = -4.910$ ;  $p < 0.01$ ),

identification ( $z = - 3.819$ ;  $p < 0.01$ ) and regulation ( $z = - 7.244$ ;  $p < 0.01$ ) (see Figure 5 and Table 5).

INSERT FIGURE 5 HERE

INSERT TABLE 5 HERE

## **Discussion and conclusions**

The results of this paper contribute empirical evidence that allows educators, firstly, to know how students perceive feedback practices at an online university and, secondly, to analyze whether students' prior experience with online feedback has an influence on how they engage with it.

Overall, regarding how often students received feedback, there are no conclusive results. Given that approximately half of the students reported receiving it on a regular basis and the other half report receiving it more sporadically, deeper analysis will be required to compare their perception with what goes on during the teaching-learning process. Importantly, the students did not perceive that they had not received any feedback at all, which is key to online education practices that promote learning. In accordance with the recent research by Vattøy et al. (2021), the results obtained in our study further confirm the significance of the amount of feedback, as the experience that students have in relation to the amount of feedback facilitates cognitive engagement. Our study also confirms these results but especially for online environments. The implications this has in the online context are even more relevant, because students' feeling of loneliness could suggest cognitive and emotional disengagement, and therefore increase the dropout rate (Kuo et al., 2021).

Regarding the type of feedback that students received, almost three-quarters of the sample reported receiving corrective feedback. This perception could be related to the relevance given to grades. The study by Winstone, Bourne, et al. (2021) concluded that students using a learning management system focus on the grade that they have obtained without needing to review the feedback (because it is independent of the grade). In our study, grades and feedback are integrated, although the virtual campus does allow students to check their grades without paying attention to feedback. The results of both studies prompt us to reflect on the relationship between grades and feedback, and specifically the virtual place where feedback and grades are posted. Teaching practices

that require students to check feedback before or while viewing their grade should be promoted in online environments.

The fact that students reported receiving little epistemic and suggestive feedback could be interpreted as a sign that feedback literacy should be promoted among teachers. Not only do students need to be literate about what to do once they receive feedback, but teachers also need to improve their feedback giving skills (Carless & Winstone, 2020).

The results in relation to timing are similar to those regarding type of feedback, with almost three-quarters of the students reporting that they received feedback once the assignment had already been assessed. Moreover, the results show few students having had the opportunity to revise and resubmit their work based on the feedback received.

This paper provides empirical evidence showing that students still perceive their experience with online feedback as closer to a transmissive and traditional approach than to a more dialogical and procedural one (Winstone & Carless, 2019). Our study was based on students' perception, which, according to Harrison et al. (2022), is one of the strategies used to assess quality in higher education institutions. However, this perception must be rounded out using empirical observation that provides insight into what these feedback practices are actually like. The perception of students should be compared with that of teachers, as these often differ (Carless, 2006; Dawson et al., 2019). Teachers feel that they put a lot of effort into providing feedback, but that students rarely use or engage with it. Future research should look for empirical evidence to define feedback practices from the teacher's perspective. One of the issues that teachers are likely to point out in relation to more dialogical feedback practices is the high workload involved (Nicol, 2010). However, this workload may be justified: first, it allows teachers to gather evidence during the learning process and adjust the educational support that students need on an ongoing basis; and second, it allows students to track their progress toward their target goals. That being said, there are other feedback practices that may support to lighten teachers' workload: (1) using learning analytics to streamline the way teachers provide feedback (Er et al., 2020), (2) promoting greater student involvement in the assessment and feedback processes (peer feedback) (Nicol & McCallum, 2022), and (3) leaning into techno-pedagogical designs that include various feedback tools and channels (Filius, et al. 2019). This opens a whole host of research possibilities regarding feedback practices in virtual environments.

In addition to the above-described results, this paper also provides evidence showing that despite the students' perception about feedback and the fact that it continues

to be less dialogical in nature, the experience that students have with feedback directly influences how they engage with it. In this regard, it is worth investing effort into the time prior to engagement, as these efforts will impact how students cognitively engage with feedback. The frequency, timing, and type of feedback, as well as the possibility of revision, are all factors to consider when designing feedback practices. Only with the presence of these factors can one contribute to better cognitive engagement with feedback. Students whose prior experience with feedback has more closely resembled a dialogical model (i.e., they reported having received epistemic or suggestive feedback, students who have had the possibility to resubmit their assignments, and those who have received feedback while completing their assignments) show higher levels of cognitive engagement with feedback.

Beyond this, a challenge would be to identify which combination of feedback factors is most effective. For example, a form of corrective feedback that provides feedback beyond just the grade and administered during the learning process, that is, with a formative function and with the possibility of revision, could be a valid practice for a given learning situation. It would also be interesting to identify what type of practices make cognitive engagement with feedback more difficult and in what situations they might occur (Uribe & Vaughan, 2017).

While these results are applicable at the instructional level, they can also help define a feedback strategy at the institutional level. In this sense, assuming that the students' prior experience with feedback involves cognitive engagement, special attention should be paid, on the one hand, to the transition stages between educational levels in accordance with Hounsell (2021). On the other hand, one could think of practices aimed at students who are joining an online university for the first time, encouraging subsequent years of study allowing the institution to continue profiting from continued enrolment. An essential element for this to be successful would involve promoting students' online feedback literacy from their very first semester at the university. This way, the experiences that they have in relation to the frequency, timing, and type of feedback, as well as the opportunities given to them to review their work, will result in better cognitive engagement.

This research opens the door to future research that will allow the analysis of the relationship between the time prior to engagement and the emotional dimension of engagement, which, according to the literature on feedback processes, is also a relevant aspect to consider.



## **Implications**

This empirical study contributes to the discussion on two relevant issues currently identified in teaching and learning processes, specifically in online environments at university level: student dropout and engagement with feedback.

The results show that students do generally receive feedback, so the question of whether or not teachers are providing it can be put to rest. Instead, open universities can focus their attention on exploring how the educational support provided to students through feedback during the learning process can be used to reduce the feeling of loneliness, which is often reported by students in online environments. Feedback practices could also be redesigned, for instance, by introducing video feedback, to engage students and lower dropout rates.

Finally, although feedback was not perceived as especially dialogical, students' prior experience with it nonetheless influences their engagement. Therefore, it is essential, as mentioned above, to work purposefully on feedback design. Beyond this, educators we should focus on designing and promoting more dialogical online feedback practices, in order to further increase the cognitive engagement indices.

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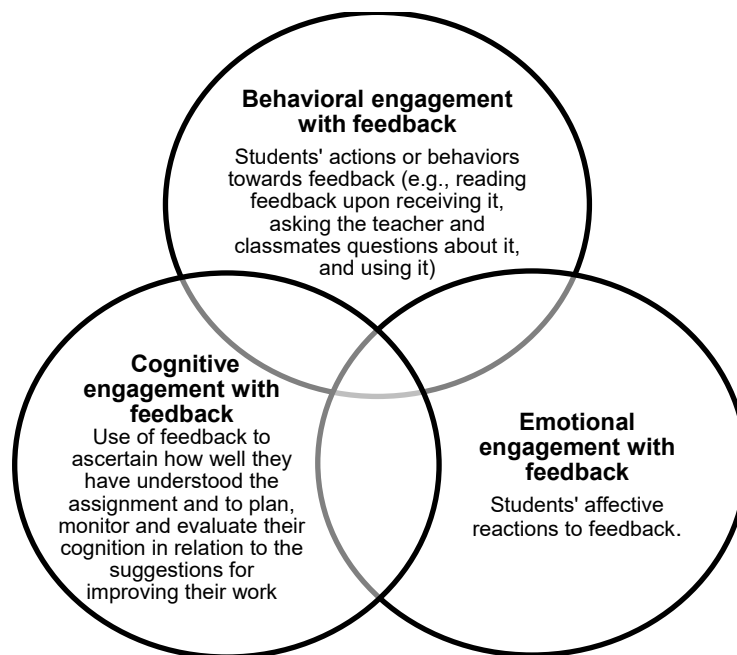
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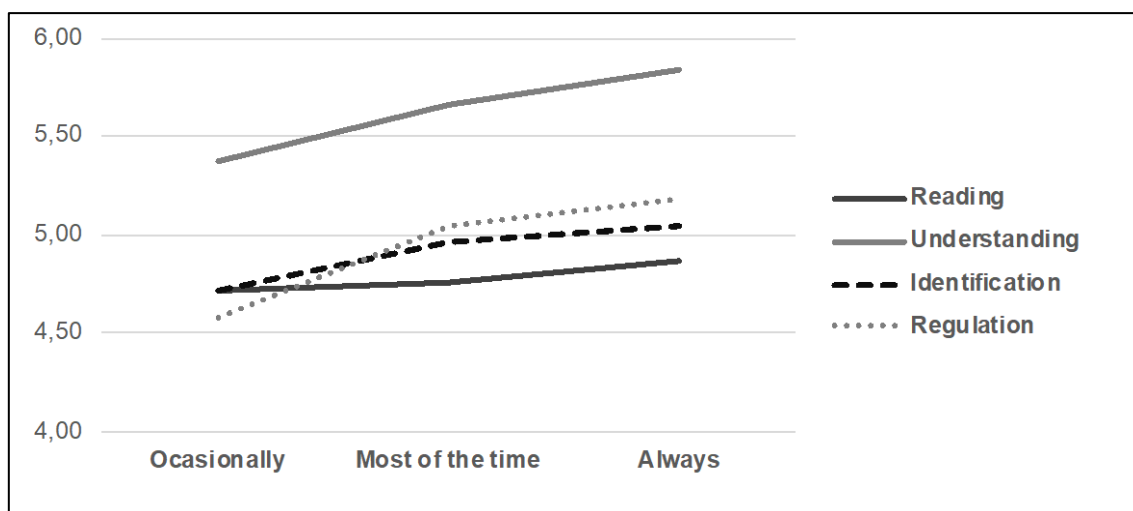
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Figure1. Engagement with feedback in online learning environments.



Own elaboration based on Fredricks et al. (2004) model

Figure 2. Relationship between cognitive engagement with feedback in online HE and frequency of feedback received in the past.

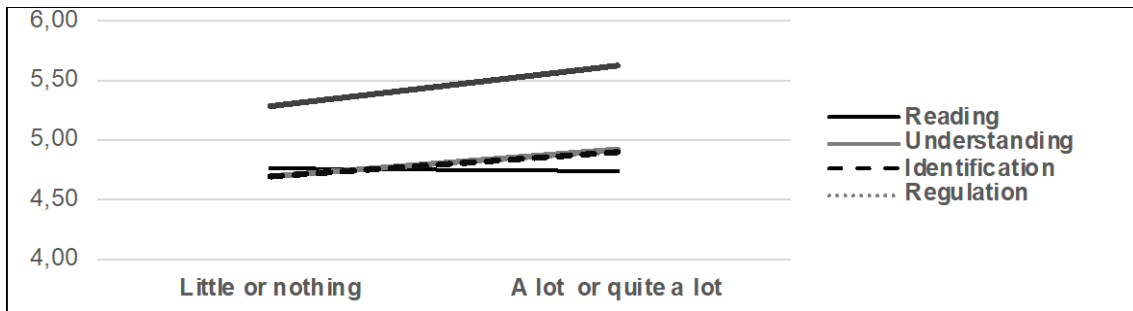


Mean values of 1-7; 1=low (not frequent) and 7=high (very frequent)

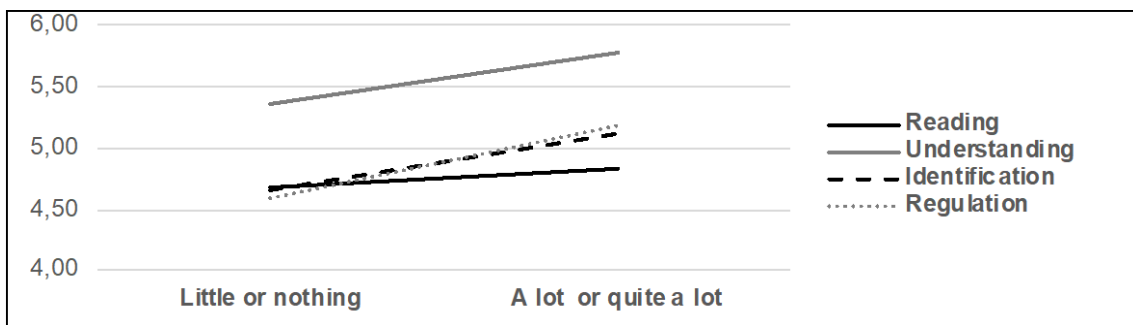
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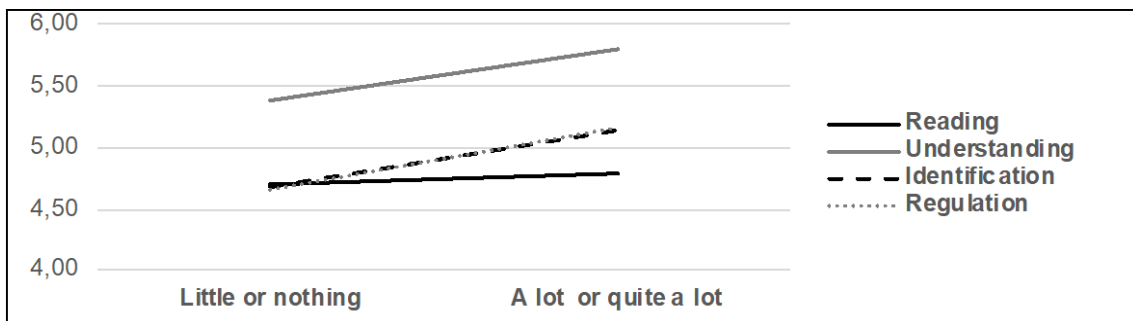
Figure 3. Relationship between cognitive engagement with feedback in online HE and feedback type received in the past.



Before submission



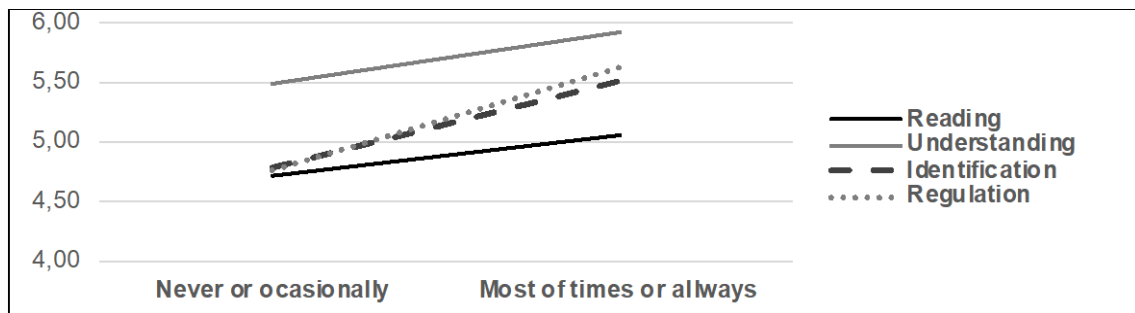
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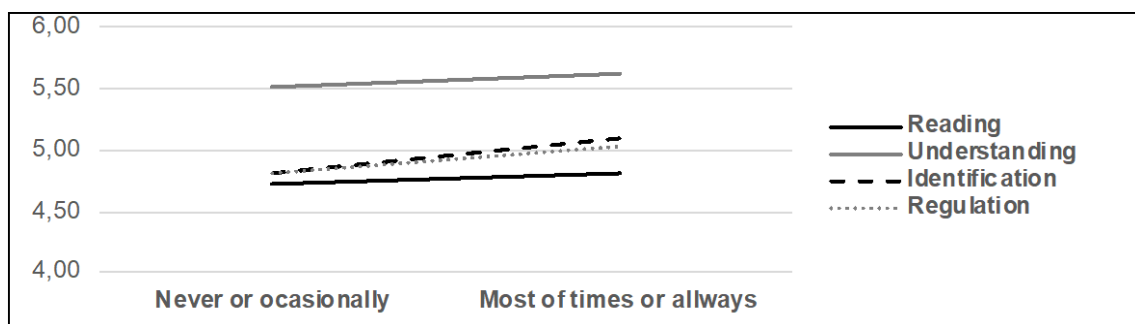
After grading

Mean values of 1-7; 1=low (not frequent) and 7=high (very frequent)

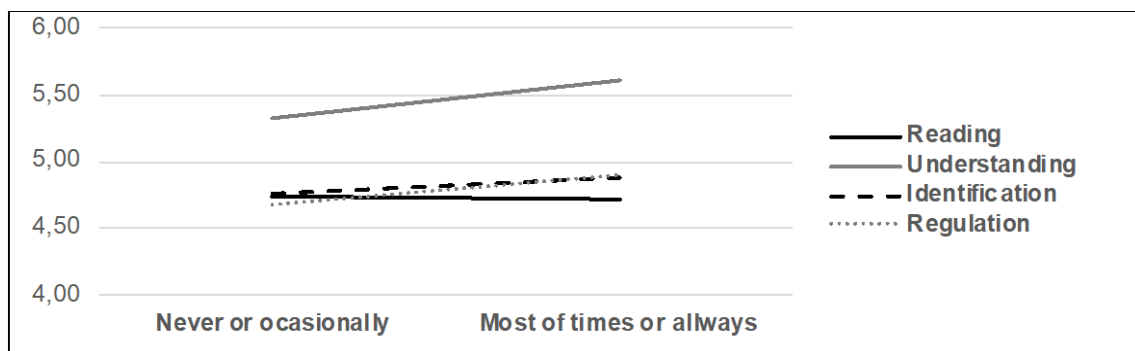
Figure 4. Relationship between cognitive engagement with feedback in online HE and moment when it was received in the past.



Before submission



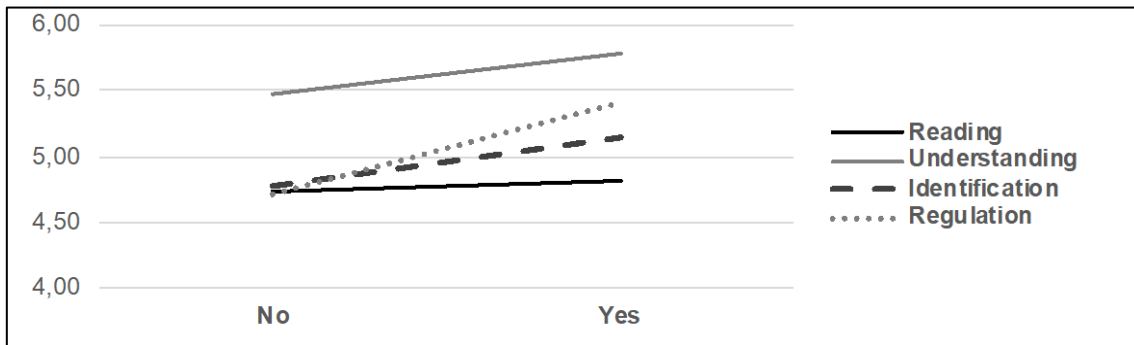
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After grading

Mean values of 1-7; 1=low (not frequent) and 7=high (very frequent)

Figure 5. Relationship between cognitive engagement with feedback in online HE and the resubmission opportunities in the past.



Mean values of 1-7; 1=low (not frequent) and 7=high (very frequent)

Table 1. Operationalization of cognitive engagement with feedback in online HE

Subdimension	Indicator
<b>No use of feedback</b>	<i>I don't tend to do anything with the feedback received even if I have to resubmit my work.</i>
<b>Reading</b>	<i>I always read the feedback I receive. I comment on the feedback I receive with peers.</i>
<b>Understanding</b>	<i>I ask the teaching staff questions on the parts of the feedback I don't understand. I aim to understand everything they are trying to tell me in the feedback. I associate the feedback with what I already know or with prior experience. When I read the feedback, if there's something I don't understand, I do something to understand it: I ask the teacher to clarify the aspects I don't understand, I read it again or look for more information, etc. I associate the feedback with the work I have done.</i>
<b>Identification</b> (positive and negative aspects and improving task)	<i>I seek out information based on the feedback I receive. When I read the feedback, I review the work, trying to identify strengths, areas for improvement and/or</i>

*misunderstandings/errors in the work, but only if I have to resubmit it.*

*I identify aspects to be improved and seek out information from different sources to improve/enrich it.*

*I identify areas for improvement and plan future actions to improve it.*

*I try to take from the feedback those aspects I need to consider in the future.*

**Regulation** (of performance of task)

*I redo the work and check what I am doing to see if I am really taking into account the aspects indicated in the feedback.*

*Based on the feedback, I redo the work and check whether it really includes the indicated aspects.*

Scale: 1-7; 1=low (not frequent) and 7=high (very frequent)

Table 2. Relationship between cognitive engagement with feedback in online HE and frequency of feedback received in the past.

Statistical details<sup>1</sup>

Subdimension	Feedback frequency <sup>2</sup>									Kruskal-Wallis test			TOTAL		
	Occasionally			Most of the time			Always			Chi <sup>2</sup>	df	p	n	M	SD
	n	M	SD	n	M	SD	n	M	SD						
No use of feedback	689	2.14	1.6	665	1.7	1.29	233	1.8	1,6	29.44	2	<.001	1587	1.9	1.5
Reading	689	4.7	1.0	665	4.6	1.05	233	4.9	1,2	3.479	2	.176	1587	4.8	1.1
Understanding	689	5.4	1.1	665	5.7	1.06	233	5.8	1,0	57.34	2	<.001	1587	5.6	1.1
Identification (positive and negative)	689	4.7	1.3	665	5.0	1.22	233	5.1	1,5	14.59	2	<.001	1587	4.9	1.3

aspects and  
improving  
task)

Regulation

(of performance of task)

689	4.6	1.4	665	5.0	1.34	233	5.2	1.5	51.9	2	<.00	158	4.9	1.4
									7		1	7		

Scale: 1-7; 1=low (not frequent) and 7=high (very frequent)

<sup>1</sup> Mean and St.Dev. are shown in order to facilitate analysis.

<sup>2</sup> Category of 'Never' not included due to its small sample (n=44)

Table 3. Relationship between cognitive engagement with feedback in online HE and feedback type received in the past.

Statistical details<sup>1</sup>

Subdimen- sion	Type									TOTAL		
	A lot or quite a lot			Little or nothing			Mann-Whitney test			n	M	SD
	n	M	SD	n	M	SD	U	z	p			
<b>Corrective</b>												
No use of feedback	1203	1.9	1.5	428	2.1	1.6	172836.00	-3.10	.002	1631	1.9	1.5
Reading	1203	4.7	1.0	428	4.8	1.2	182882.00	-1.29	.200	1631	4.7	1.1
Understanding	1203	5.6	1.0	428	5.3	1.3	155252.50	-5.30	<.001	1631	5.5	1.1
<b>Identification</b>												
(positive and negative aspects and improving task)	1203	4.9	1.3	428	4.7	1.5	170986.00	-2.99	.003	1631	4.9	1.4

Regulation (of performance of task)	1203	4.9	1.4	428	4.7	1.5	174908.50	-2.41	.016	1631	4.8	1.4
<b>Epistemic</b>												
No use of feedback	701	1.8	1.4	930	2.0	1.6	230168.00	-4.41	<.001	1631	1.9	1.5
Reading	701	4.8	1.0	930	4.7	1.2	235820.50	-3.26	.001	1631	4.7	1.1
Understanding	701	5.8	1.0	930	5.4	1.2	201369.50	-7.49	<.001	1631	5.5	1.1
Identification (positive and negative aspects and improving task)	701	5.1	1.3	930	4.7	1.4	208838.50	-6.56	<.001	1631	4.9	1.4
Regulation (of performance of task)	701	5.9	1.3	930	4.6	1.5	199672.50	-7.71	<.001	1631	4.8	1.4
<b>Suggestive</b>												
No use of feedback	597	1.8	1.5	1033	2.0	1.6	235623.50	-2.13	.033	1631	1.9	1.5
Reading	597	4.8	1.1	1033	4.7	1.1	234234.00	-2.12	.034	1631	4.7	1.1
Understanding	597	5.8	1.0	1033	5.4	1.2	194113.50	-7.21	<.001	1631	5.5	1.1
Identification (positive and negative aspects and improving task)	597	5.1	1.3	1033	4.7	1.4	204785.00	-5.84	<.001	1631	4.9	1.4
Regulation (of	597	5.2	1.3	1033	4.7	1.5	208611.00	-5.35	<.001	1631	4.8	1.4

performance  
of task)

Scale: 1-7; 1=low (not frequent) and 7=high (very frequent)

<sup>1</sup> Mean and St.Dev. are shown in order to facilitate analysis.

Table 4. Relationship between cognitive engagement with feedback in online HE and the moment when it was received in the past.

Statistical details<sup>1</sup>

Subdimension	Timing						Mann-Whitney test			TOTAL		
	Never occasionally			or Most of the time or always			U	z	p	n	M	SD
	n	M	SD	n	M	SD						
<b>Before submission</b>												
No use of feedback	147	2.0	1.5	161	1.7	1.45	90644.50	-3.18	.001	163	1.9	1.5
Reading	147	4.7	1.1	161	5.1	1.03	83223.50	-4.41	<.001	163	4.7	1.1
Understanding	147	5.5	1.1	161	5.9	0.94	79203.00	-5.06	<.001	163	5.5	1.1
Identification (positive and negative aspects and improving task)	147	4.8	1.4	161	5.5	1.08	69842.50	-6.93	<.001	163	4.9	1.4
Regulation (of performance of task)	147	4.8	1.5	161	5.6	1.13	67240.00	-7.44	<.001	163	4.8	1.4
<b>At the time of submission</b>												

No use of feedback	135	2.0	1.5	272	2.0	1.54	146621.0	-	.362	163	1.9	1.5
	8						0	0.91		1		
Reading	135	4.7	1.0	272	4.8	1.08	148410.0	-	.603	163	4.7	1.1
	8						0	0.52		1		
Understanding	135	5.5	1.1	272	5.6	1.21	137910.0	-	.025	163	5.5	1.1
	8						0	2.24		1		
<b>Identification</b>												
<i>(positive and negative aspects and improving task)</i>												
	135	4.8	1.4	272	5.1	1.26	131448.5	-	.001	163	4.9	1.4
	8						0	3.31		1		
<b>Regulation</b>												
<i>(of performance of task)</i>												
	135	4.8	1.5	272	5.0	1.36	138440.5	-	.031	163	4.8	1.4
	8						0	2.15		1		
<b>After grading</b>												
No use of feedback	425	2.1	1.8	1206	1.9	1.40	188594.5	-	.014	163	1.9	1.5
							0	2.46		1		
Reading	425	4.7	1.2	1206	4.7	1.07	200276.5	-	.612	163	4.7	1.1
							0	0.51		1		
Understanding	425	5.3	1.2	1206	5.6	1.01	164308.5	-	<.001	163	5.5	1.1
							0	5.62	1	1		
<b>Identification</b>												
<i>(positive and negative aspects and improving task)</i>												
	425	4.8	1.3	1206	4.9	1.34	188353.0	-	.028	163	4.9	1.4
							0	2.19		1		
<b>Regulation</b>												
<i>(of performance of task)</i>												
	425	4.7	1.4	1206	4.9	1.45	177821.5	-	<.001	163	4.8	1.4
							0	3.69	1	1		



Scale: 1-7; 1=low (not frequent) and 7=high (very frequent)

Table 5. Relationship between cognitive engagement with feedback in online HE and the resubmission opportunities in the past.

Statistical details<sup>1</sup>

Subdimension	Resubmission opportunities									TOTAL		
	No			Yes			Mann-Whitney test			N	M	SD
	n	M	SD	n	M	SD	U	z	p			
No use of feedback	1327	2.0	1.6	304	1.7	1.3	147629.50	-4.70	<.001	1631	1.9	1.5
Reading	1327	4.7	1.1	304	4.8	1.0	161203.50	-2.01	.036	1631	4.7	1.1
Understanding	1327	5.5	1.1	304	5.8	1.1	142516.00	-4.91	<.001	1631	5.5	1.1
Identification (positive and negative aspects and improving task)	1327	4.8	1.4	304	5.1	1.3	149628.00	-3.82	<.001	1631	4.9	1.4
Regulation (of performance of task)	1327	4.7	1.5	304	5.4	1.2	127387.50	-7.24	<.001	1631	4.8	1.4

Scale: 1-7; 1=low (not frequent) and 7=high (very frequent).