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TEMPORAL AND ASSESSMENT DIMENSION

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Temporal and assessment dimensions: characterisation of feedback after assignments

ABSTRACT

The teaching and learning process in an online environment is based on the development of activities which take place continuously over time. In order to promote the formative function of assessment it is necessary for the teacher to give feedback after the student has delivered each assignment. From a descriptive point of view, this article defines the characteristics of this feedback which is offered after each assessment assignment in an online educational environment. Through the qualitative methodology of content analysis, a system of categories has been constructed which enables evidence to be provided of the actions that teachers undertake to provide feedback. The results reveal various feedback strategies which take place at this particular point of the learning activity. These different strategies highlight the importance of the self-assessment process, which requires the planning of times at which the student can show the use made of the feedback, once they have compared their assignment with the model or solution posted in the classroom. This article provides empirical evidence of the link which is established between the temporal dimension (the time at which feedback takes place) and the assessment dimension (diagnostic/ formative/ summative function) in online teaching and learning processes.

KEYWORDS

Feedback; Online learning environments; Assessment of learning; Self-assessment.

INTRODUCTION

According to the socio-constructivist approach (Coll, 2001; Onrubia, 2005; Salomon & Perkins, 1998), the process of teaching and learning in online educational environments should be based on assignments that take place within a framework of continued learning assessment (Macdonald and Twinning, 2002). If this assessment is to contribute to advancing the learning process, as well as being continuous, it must also meet the formative condition of assessment; that is, it must be constantly focused on improving learning (Allal, 1979; Perrenaud, 1998). From the contributions of McLoughlin & Luca (2001), it can be deduced that formative and student-centered assessment is best suited to the characteristics of online environments. The particular characteristics of asynchrony, require there to be monitoring of the student's learning process. Formative assessment, in the university context in which we are situated, is normally complemented by more traditional summative or outcome assessment (Morgan and O'Reilly, 1999). Both kinds of assessment show the importance of the temporal dimension in the teaching and learning process. From the student's point of view, it is necessary to identify the progress they are making in the attainment of the proposed objectives both during the educational action and at the end. In this evaluative context, feedback processes help to give assessment a formative nature, geared towards the continued improvement of learning. At the same time, feedback has a regulatory nature which enables the student to understand and place the results of their actions within the context of the goals they aim to achieve.

In order to ensure the regulation of learning (Allal, 1979) in a teaching and learning process based on the development of assessment activities (in the context of the Open University of Catalonia, they are called PACs), it is necessary for the student to receive feedback at three specific times. These times are as follows:

A) At the beginning of the educational activity, with a diagnostic function which enables the teacher to make the adjustments necessary in order to adapt to the students' characteristics and rate of learning.

B) After each of the proposed assignments of the course, with a formative function; that is to say, focused on improving learning.

C) At the end of the educational activity: with the aim of providing the student with information on the progress made in their own learning.

This article is focused on feedback given after each assignment of the course as this is the time at which feedback is hugely important as a facilitator of learning improvement. Feedback is thus conceptualised as part of the framework of formative assessment and is generally defined as the information received by students which allows them to make progress in their learning process. Feedback with a regulation function allows students to place their own learning against the proposed educational objectives (Nicol and Macfarlane-Dick, 2006).

Among several perspectives on feedback (see Mory, 2004 for a review), Narciss (2004) and Narciss and Huth (2006) identified three dimensions: presentation; that is, the form of feedback (who gives feedback? to whom? when? where?); functionality; that is, the proposed objective; and thirdly, a dimension

concerning semantics or feedback content. This study is focused on the latter: the semantic dimension. A review of the literature suggests that it is made up of four sub-dimensions. Feedback must therefore be made up of information for identifying and correcting errors, information about the correct response, information about improving the assessment assignment and information for going into the content which forms the object of study in more depth.

According to Kulhavy and Stock (1989), the first two sub-dimensions, linked to errors and correct responses, make up the verification component of feedback, and the latter two sub-dimensions, linked to improving the assignment in hand and information for going into the subject matter in more depth, belong to the elaboration component of feedback. According to Kulhavy and Stock and Mason and Brunning (2001), feedback must be made up of information for both verification and elaboration in order to ensure the success of the teaching and learning process. These three dimensions are complemented by another two factors, one of which relates to student characteristics (i.e. previous knowledge) and the other to instructional design, i.e. learning objectives, activities, content and evaluation.

Taking into account this multidimensional definition of feedback, many authors have identified the relevance of formative feedback (Alvarez, Espasa, & Guasch in press). There is a positive association between the presence of feedback and performance (Klecker, 2007; Kramarski and Zeichner, 2001; Mason and Brunning, 2001). However, the characteristics of this feedback are today being studied less. There are some precedents in F2F environments (Nicol & Macfarland-Dick, 2006; Shute, 2008) which could be considered a starting point, however, there are few other studies discussing the characteristics of feedback in an online environment.

Within this problematic situation, the research question to be answered in this study has its origin in the results of previous studies (Espasa, 2009; Espasa & Meneses, 2010). The results of this study show that there are statistical differences between feedback given after each assignment of the course and performance (i.e. marks and level of satisfaction). In this article we aim to go further and characterise this kind of feedback. The research question posed by this study is: what strategies do the teachers (and students) use to provide feedback after the assignments?

METHODOLOGY

This research is based on the specific case of the Open University of Catalonia (UOC), which has been a distance university from the very beginning[1]. This university can be considered as a representative university where the whole teaching and learning process is on an online platform and the feedback is fundamentally provided in the form of an email.

DATA COLLECTION

Three courses were selected to be analysed: Fundamentals of Search and Recovery of Information, part of the Documentation programme; Applied Statistics, part of the Market Research and Techniques programme; and Professional Orientation, part of the

Educational Psychology programme. These courses were identified as regulatory courses because of the nature of their feedback which is aimed at promoting the regulation of learning and because there were high levels of interaction between teachers and students (see selection criteria, Espasa, 2009).

This data collection procedure began with the recording of messages exchanged between teachers and students in the virtual classrooms of the selected subjects. Next, the observation technique (Savenye and Robinson, 2004; Mazur, 2004) was used to identify the Feedback Units (FBUs). This unit enables us to understand feedback in the form of a process or sequence; that is to say, not in the form of an isolated message (Bardin, 1977; or Rourke, Anderson, Garrison and Archer, 2001). We define the FBUs as a sequence of not necessarily sequential messages which contain feedback information or material for the student. There is an evaluation component which triggers them and a thematic coherence which gives them meaning.

The FBUs identified make up the corpus of analysis of this study. A total of 1404 messages from the selected subjects were collected, organised and systematised. The table below shows a summary of these FBUs defined for each subject.

Table 1. Sample

Table 1 Sample	
	N Feedback Units (N total emails exchanged in virtual classrooms)
Fundamentals of Search and Recovery of Information	4 (327)
Professional Orientation	13 (777)
Applied Statistics	9 (300)
TOTAL	**26 (1404)**

ANALYTIC STRATEGY

The analytic strategy was based on a procedure of analysis of deductive/inductive content (Bardin, 1977; Mazur, 2004). The emails which made up the FBUs were divided into different extracts which inductively led to the categories emerging. The result of this categorisation enabled the diversity and typology of the actions carried out by the participants (teacher and students) in the teaching and learning process to be obtained in relation to the feedback processes. The analysis of the content therefore involved a constant spiral toing and froing, from theory to practice, so as to be able to construct a system of categories (see the results section). The analysis of these electronic exchanges facilitated the identification of a set of categories that will enable us to understand the semantic sub-dimensions of feedback: identification/ correction of errors, correct response, improving the assignment and more in-depth information.

RESULTS AND DISCUSSION

The objective of this study is to identify the strategies used by teachers to provide feedback after each assignment of the course. In order to structure the results obtained we will take into account the four sub-dimensions which have been defined by literature in relation to the semantic dimension of feedback. The table below (see Table 2) shows the categories we identified from the content analysis.

Table 2. Categories identified based on the systematic observation of feedback

	Category	Description
A) **Identification and correction of errors**	Identification of Error (simple form)	Feedback that shows an error has been committed without explaining it.
	Identification of Error with Argument	Feedback that shows an error has been committed arguing why it has been committed.
B) **Correct response**	Congratulations (simple form)	Feedback action that encompasses the positive expressions and assessments of students' contributions without explanation.
	Congratulations with Arguments	Feedback action that encompasses the positive expressions and assessments of students' contributions with an explanation of why.
	Reminder of Aims, Instructions and Criteria	Defines feedback action in which the teacher reminds the student of the aims, instructions or criteria that were previously introduced in relation to the specific assignment.
	Solution (simple form)	Defines feedback action which consists of the teacher posting a document for the virtual class with the correct response to the proposed assignment.
	Solution (Argued)	Defines feedback action which consists of the teacher posting a document in a communication space in the virtual classroom with the correct response to the proposed assignment, explaining why he or she has given that response and not another.
	Possible Solution (suggestion)	Defines feedback action which consists of providing a possible correct response to the query or question proposed (often students responding to other students, proposing a solution, although they are not sure of their own response). This response is also applied when the teacher responds to a question as part of a debate assignment, giving his or her own opinion.
	Model Student Responses (simple form)	Defines feedback action consisting of posting a model response from the student's responses without explaining why those responses have been selected and not others.
	Model Student Responses with Arguments	Defines feedback action consisting of posting a model response from the students' responses and explains why the response of those students have been selected and not others.

C) **Improving the task**	Guidelines for self-assessment	Defines feedback action in which the teacher provides guidelines for the self-assessment process that the student must undergo.
	Normative Assessment	Defines feedback action applied when giving instructions in relation to the normative assessment and in the normative assessment itself (file attached with a graph comparing the marks achieved by the students).
	Information about improving the assignment completed	Feedback action relating to the assignment or the specific question asked; that is, relating to the feedback's direct referent.
	Information about how to proceed with the learning process	Feedback action relating to the learning process and, therefore, not as related to the assignment or query made by the student as would be the case in the category: "information about how to improve the task completed".
D) In-depth information	Contribution of more in-depth information	Defines feedback action applied when in the same text (message or document) information is provided that helps the student look deeper into the content that forms the object of study.
	Contribution of more in-depth information through external resources	Defines feedback action that, through a bibliographic reference, a web page, or in general any other external source provides information that can be used by the student to go deeper into the content that forms the object of study.

The categories obtained enable us to prove the actions undertaken by the teacher when he or she gives feedback after each assignment. The time at which this feedback is given means that it acquires specific characteristics which make it different in comparison with feedback which is given at the start of the teaching and learning process and feedback which is given at the end.

In the table it can be seen that some of the categories identified belong to what we have called the "simple form" and the "argued form". The "argued form" is that which provides the student with explanatory information. Using this differentiation between the simple form and the argued form, parallels can be drawn with the verification elaboration that makes up the feedback. The categories identified as being a simple form correspond to verification feedback while the categories identified as the argued form, as they facilitate understanding and provide more information for the student with which he or she can, potentially, self-regulate learning, correspond to elaboration feedback.

This article takes a closer look at feedback actions relating to the correct response (sub-dimension b.) as it is in this feedback where the most interesting strategies from the teacher's point of view are revealed. Nevertheless, the categories obtained in the content analysis show the actions relating to the identification of errors (sub-dimension a.), as well as the actions which relate to providing the student with information to improve the task (sub-dimension c.) or to expand and go deeper into the content referred to by the study (sub-dimension d.).

Focusing therefore on the teacher's strategies to provide the correct response in the case of feedback after the assignments are delivered, the results obtained show the presence of an evaluation component, the

congratulations which enable students to have an overall and general evaluation of the activity.

Furthermore, the results obtained specify that this type of feedback contains information on the learning objectives of the assignment, the assignment demand and, in some cases, information relating to the overall evaluation process. According to the literature on regulation of learning processes (Boekaerts, 1997; Butler and Winne, 1995) remembering these aspects at the time of correction makes it easier for students to reflect on their own learning, as they are able to measure their efforts and plan the actions they need to undertake in order to achieve the proposed objectives. An example of this type of feedback is shown below:

Example of the category: "Reminder of aims, instructions and criteria"

Objectives:
First part:
. Identifying the main concepts of the current Professional Orientation definitions
. Examining the theoretical approaches on which the orientation action is based.
This assignment requires you to prepare the proposed study material and also the bibliographic or reference material that you have used.
(...)
Evaluation criteria
Consistency of the theoretical arguments with the practical orientation design
Preparation and summary of the concepts studied in the materials (...)

Another result obtained in the analysis of the content shows two clear actions undertaken by the teacher to provide students with the correct response. On the one hand, the solution (simple form, argued form and possible form) and, on the other, the response model (simple and argued form). Both forms of providing the correct response are based on the students' self-assessment; that is, it is the student's responsibility to compare the model solution or response with the work they have done, thus identifying any possible errors.

In relation to the feedback after the assignments provided on the basis of the solutions, we find the simplest form (simple form), in which the teacher merely gives the student a specific response to what he or she has been asked. An example can be found in the extract below:

Example of the category: "Solution (simple form)"

What effect could be expected from a price increase of €60? (maximum 1 line) We can expect a decrease of 0.71 x 60 = 42.6 in sales

There is also the argued form, which could be considered a more elaborate feedback than the previous one as the solution is accompanied by an argument. More information is therefore provided to the student, helping them to understand the solution to the assignment.

Example of the category: "Solution (argued form)"

In order to be able to find differences between the concepts in module 2, we have identified three main points: the classification of the stages of Professional Orientation undertaken by Álvarez (1995), which enables us to take a journey through time; point 2 "Definition and Dimensions of Professional Orientation", which allows us to identify the common and differential elements of previous and current concepts; and appendix 4 M2 "Orientation" by Sofia Isús, which makes a comparison of the ways of understanding a single concept, by means of its meaning.

Lastly, we have "possible solution" feedback. This feedback relates to the response given by students to questions raised in relation to the demand. The sequence which takes place in this case is started by a student who has a query. This query is answered by his or her classmates, who offer a solution which student doesn't know if it's totally right. Finally, the teacher intervenes and gives the correct response.

Apart from solution-based feedback, a second way of providing the correct response has been identified on the basis of a model constructed from extracts of the activities handed in by students. The simple form has also been identified in the models; that is, the teacher posts the model constructed from extracts that they have selected from the students' activities; and the argued form, which includes arguments informing the students of the reason for the selection of the assignment (or extract) in question. Examples of these actions are shown below:

Example of the category: "Model Student Responses (simple form)"

Shown below are various paragraphs from the work of three classmates which might help you with your assignment. I have highlighted some aspects with comments in the margin to allow you to take another look at your assumptions.
Student6 - Student 7 - Student 8
Highlighted points:
Advisory relationship of the adviser with the teaching staff.
Analysis of relevant information of the demand:
. The advice that the school implemented was informative and detailed
. Professional Orientation advice as an educational process.
(...)

Example of the category: "Model Student Responses with Arguments"

We will now discuss three types of designs studied by classmates aimed at different target groups: the first is a programme aimed at women seeking employment, the second is aimed at young people under the age of 25 moving into the employment market and the third discusses training and orientation for people with mental disabilities. In each of the three cases the mark is given on the basis of orientation and training. The definition of the characteristics of the target groups is very well defined and gives one a very rough idea of the type of interventions which can be carried out (...)[2]

In short, after the assignments we have identified two different ways of providing the correct response. On the one hand, we have the solutions and, on the other, the models constructed from the activities handed in by students.

As has already been made clear, these two strategies for providing the correct response in an online environment are linked to a process of self-assessment by the student. Along these lines, Collis, De Boer, and Slotman (2001) studied different types of feedback, among which they identified model-response and solution-based feedback and pointed out the importance of the comparison between the assignment handed in by the student and the model provided by the teacher in the classroom. Macdonald (2001), a researcher focused on self-assessment processes in learning, gave us a more detailed idea of the composition of the revision and evaluation process triggered by feedback, which requires a comparison between the work done and a model. According to the author, this comparative action should be accompanied by other actions aimed at discussing, reflecting on and sharing the revision undertaken by the students of the model presented. The results of our study do not include evidence proving that these actions to discuss and review the comparison between the student's assignment and the model actually take place.

Another of the categories identified makes reference to the instructions given by the teacher in relation to the self-assessment process. These are very simple instructions, often by way of a reminder, in which the teacher makes it clear to the students that they must carry out the exercise of comparison between their work and the solution or model provided to them and, once the comparison has been made, they may then ask questions or mention any queries they have in the classroom.

Shown below is an example of the instruction given by the teacher in relation to self-assessment:

Example of the category: "Guidelines for self-assessment"

From today, Tuesday 22 March, you can download the solution for PAC1 and check whether or not you have got the answers right. I recommend that, irrespective of the mark obtained and whether or not you have handed in PAC, you have a look at it to answer any queries you might have. If you have any questions you know where to find me!

Finally, another of the characteristics of feedback given after the assignment that has been observed in the analysis of online educational practice, is the information on normative assessment. Providing the students with general information on the activities carried out by all their classmates represents key information from the point of view of the regulation of learning, as it enables students to see how their progress in the learning process compares to the rest of their classmates. What is therefore being promoted is normative assessment which, unlike criteria-based evaluation, does not set benchmarks which have to be achieved, but proposes an assessment process in which the benchmark is set by the level of knowledge held by the group of students as a whole.

To sum up, feedback given after the assignments in the courses analysed is semantically characterised by the identification of errors with and without (simple form) an argument. This type of

feedback is also based on the correct response. The results emphasise the relevance of model-response feedback. This feedback is made up of: a reminder of aims, instructions and criteria; promoting self-assessment; incorporating evidence of normative evaluation and including congratulations on the quality of the assignments completed by the students. This feedback includes information on how to make progress in learning and also information that goes deeper into the content of the learning.

CONCLUSION AND IMPLICATIONS FOR PRACTICE

The presence of feedback at different points of teaching and learning processes in an online environment is necessary to facilitate learning. Instructional design in these environments is based on carrying out activities which progressively help the student to appropriate the learning content. One of the key points at which feedback must be promoted is after each assignment of the course because of their proven influence on the performance of students and in order to ensure the formative function of assessment. This article aims to show what this type of feedback is like, as well as its characteristics.

As is made clear by the results, one of the most important aspects of feedback at this specific point, after the activities have been handed in, is self-assessment. This process consists of a comparison between a model or solution and the assignment produced by the student. The comparison is expected to trigger a communication exchange process between students, or between the teacher and the student (Macdonald, 2001). The analysis of the content has enabled us to prove that the stages following the comparison of the student's work with the model do not take place even if the teacher provides the students with an incentive to do so. No evidence has thus been found which would allow the teacher to identify the use that the student has made of the feedback. It can therefore be concluded that one way of providing feedback after the PAC identified in the selected subjects is based on self-assessment, but it must be ensured that this self-assessment process by the student is carried out to its conclusion.

The planning and instructional design of subjects in a virtual environment should therefore allow not only for a time of self-assessment, which requires an individual effort, but also for a time for communication exchange, in which the student can bring up any queries they may have and share them with their classmates and the teacher in order to resolve them and continue with the achievement of the proposed objectives.

Overall, the results of this research bring to light the necessary link between the temporal dimension and the assessment dimension. The asynchrony which characterises virtual environments involves a planning effort which affects all fields of educational activity, and therefore also affects assessment and its different functions (diagnostic, educational and summative) and forms (self-assessment, co-assessment, etc.).

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Footnotes

[1]More information about the pedagogical model and assessment model of the UOC can be found on the university's website: http://www.uoc.edu.

[2]Shown next are extracts from the students' activities, which we have not included so as not to expand too much on this extract.