Making peer-feedback more efficient: What conditions of its delivery make the difference?

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Abstract

Peer feedback undoubtedly has an impact on students' learning at the university level. Even so, how it makes an impact and which defining factors in its design wield greater influence are aspects that continue to require further analysis. This study is dedicated precisely to those defining factors: studying how students perceive their own learning process, both when giving and receiving feedback. Through a questionnaire administered to a sample of 410 university students, we inquire about how the different conditions under which the feedback is designed – such as privacy (anonymous or not), contact (personal or virtual), channel (oral, written or mixed) and consensus (individual or in a group) – impact the improvement of learning tasks and the development of the students' inter- and intrapersonal skills. The results reveal that students perceive that they learn more when they give feedback than when they receive it, and that there are certain conditions that are better suited to others for absorbing what has been learnt. In conclusion, in order to maximise its effects, the instructional design of feedback between peers must offer spaces to carry it out face-to-face – instead of anonymously– with a mixed channel of communication (complementing written comments with oral feedback) and that the feedback be agreed upon in a group, both when it is given and when it is received.

Keywords

peer-feedback, competences development, interpersonal development, professional development, conditioning factors

Introduction

The influence of assessment on the student learning process is one of the aspects that has been analysed the most in the academic literature over recent decades. According to the so-called "assessment for learning" approach (Black and Wiliam, 1998), assessment is understood as an integral part of the teaching-learning process, with a direct impact on student education (Black and Wiliam, 1998; Kennedy et al., 2008). However, for the impact to be positive, specific methodologies –ones that put the student at the centre as an active agent – must be employed. These active methodologies are based on the premise that cognitive, affective and social processes are involved in the learning process, and that sustainable learning is generated in an authentic context capable of offering educational opportunities for professional life (Boud, 2000).

Among these methodologies, peer assessment emerges as a particularly interesting approach as it allows the student to commit to the learning process and to build on their knowledge (Gielen and De Wever, 2015; Nicol et al., 2014). Peer assessment, completed by effective feedback, constitutes a basis for educational assessment and learning (Panadero and Brown, 2017). It is well documented that feedback is among the most powerful strategies for learning (Hattie and Timperley, 2007), but on the condition that the student is able to internalise the feedback (Carless and Boud, 2018), and integrate it into their future learning (Winstone et al., 2017).

In recent years, a great deal of attention has been dedicated to how feedback contributes to learning processes and to investing in efforts to increase the quality of feedback given by teachers. Despite this, studies by Williams and Kane (2009) show that assessment in general and feedback in particular are still unsatisfactory processes for students. Several recent studies have therefore focused their attention on the conditions that must be satisfied in order for the feedback to be effective: the mechanisms for giving feedback, as well as the frequency, timing, communicative processes implied and the psychological aspects raised by the feedback (Ajjawi & Boud, 2017; Panadero et al., 2019; Winstone, et al. 2017). As in the case of feedback provided by teachers, the feedback offered and received from a classmate has a multitude of implications for learning. The benefits of this type of feedback have been well documented (Henderson et al., 2019a; Ion et al., 2018).

Within the field of assessment, peer feedback stands out for its involvement in students' development; specifically, it has been defined as the learning element of peer assessment (Liu and Carless, 2006). This concept highlights the active role of the student in creating and using feedback and in putting into action a series of cognitive, motivational and social strategies that determine whether the feedback is absorbed and used (Ion et al., 2017). Peer feedback includes a process of exchanging qualitative comments, which can be done individually or as a group; it has clear benefits for students' learning processes, as it raises their level of understanding of the assessment criteria, it promotes reflection and assessment of their own work and it helps them form better assessment judgement (Harris and Brown, 2013; Panadero and Broadbent, 2018).

The different approaches and forms of peer feedback reveal the existence of different factors that can provide different outcomes for students' learning processes; some of these are related to the student (and educator) and others to the institutional contextual influence. Although these layers are all inter-connected, most studies focus on just one of them (Henderson et al, 2019b). The different combinations of variables when implementing peer feedback produce different effects on those giving the feedback – who issue judgements on their peers' work – and on those receiving it, who try to make sense of the comments and/or act accordingly (Zhu and Carless, 2018). The variables and their effects are examined in the following section and are further expounded upon through the data provided by a study conducted with university students.

Factors that influence learning through peer feedback

The attention given to aspects related to the actors offering feedback and the communication process, situate us in what Carless (2015) calls "the old feedback paradigm", focused excessively on a unidirectional, merely communicative and somewhat passive type of feedback for the person on the receiving end. The alternative is "the new paradigm", which prioritises processes of "sense-

making" for the generation and use of feedback comments as well as an approach derived from socio-constructivism (Carless and Boud, 2018).

The reasons for using peer feedback do not only present a way of "sharing responsibilities" (Nash and Winstone, 2017); they range from the possibility of offering students more immediate and agile feedback than that which is offered by the teacher (Gibbs and Simpson, 2004) to the potential for involving students in the learning process, which extends from the private and individual sphere to a more public context (Liu and Carless, 2006). To achieve the latter, students need to clarify the standards of quality, analysing the work completed by their classmates and articulating their understanding of the task at hand and the learning processes themselves – skills that are linked to self-regulating their own learning (Winstone and Boud, 2018).

Participating in a peer feedback process raises the need to summarise, cognitively restructure, confirm or dismiss different cognitive elements, and to generalise knowledge or transfer it to other situations. Therefore, it has cognitive and metacognitive benefits for those involved. Some of these benefits are more visible and others are more latent (Boud and Falchikov, 2006), but they all influence the student's future development.

Peer feedback is directly related to the affective elements of learning and supports the sense of belonging, personal motivation and responsibility (Carless and Chan, 2017; Gielen and De Wever, 2015; Panadero and Dochy, 2013). In addition, positive feedback reduces anxiety, increases empathy and self-confidence (Ion et al., 2017; Panadero and Brown, 2017) and exercises social-affective skills that are essential in education.

Learning how to provide and accept criticism, justify positions and decisions that have been made or reject suggestions are all social and assertive skills (Carless and Chan, 2017) as well as verbal and written skills (Neugebauer et al., 2016) related to teamwork and negotiation. The students' involvement in the assessment process also helps their future assessment skills (Marcoulides and Simkin, 2010).

The educational value of feedback has been analysed from various positions. From more qualitative approaches – which are especially focused on the perception of student satisfaction – to more quantitative approaches, which are linked to metacognitive variables (Roth et al., 2016). Analysis of feedback has focused on detecting factors that influence how effective it is, such as the type of task, timing, commitment to the process and practice (Espasa et al., 2018; Topping, 1998). This is why, in our study, we have chosen to analyse some of the conditions that can improve the learning experience of those involved.

Some studies that have explored these conditions include those by Zhu and Carless (2018) and Henderson et al. (2019c) in which the authors comment on some of the conditions needed for effective peer feedback. This data is added to the information presented in the study carried out by Gielen et al. (2011) in which the authors analyse 20 variables that play a critical role in peer feedback. This study highlights the importance of peer interaction, covering privacy aspects (if the feedback is anonymous, confidential or public), the contact established between the actors (virtual, face-to-face, in the classroom or outside of the classroom) or the role of the assessor or the assessed (using the active or passive role). The results of the study suggest that, in order to be effective, written feedback must be explained orally and commented on by the assessor, thus encouraging the clarification of comments, criteria and standards (Van Den Berg et al, 2006; Van Zundert et al., 2010). However, different combinations of the variables studied offer different levels of learning for those who give and those who receive the feedback. Although the benefits of feedback are irrefutable, the conditions influencing effective practice is an area that still requires further work.

Some of the different effects perceived in the way peer feedback is applied are analysed in this study. Therefore, the research question is:

How do the conditions under which peer feedback is applied affect the perception of its benefit for learning according to both the assessors and assessees?

Method

The experiment was carried out over two consecutive academic years (2017-2018 and 2018-2019) in a semester-long course, worth 6 ECTS credits, which formed a part of the Primary Education degree coursework. The course consisted of a short-term group project (three weeks) which was submitted for peer feedback once (single loop). The students had an assessment

rubric for providing feedback, which had been designed by the course's teaching team. After receiving the feedback from classmates, the group had a week to incorporate changes based on the comments and observations received before submitting the final version to the teacher.

At the end of the experiment, the students answered a questionnaire. The instrument used was specially designed to assess the students' view of learning through peer feedback and it was validated during the previous academic year. The instrument is available in Sánchez-Martí et al. (2019). It includes 87 items for assessment with a Likert-type scale with 7 levels (1 = completely disagree; 7 = completely agree). Forty-two of the items are related to giving feedback and 42 to receiving feedback. Three of them refer to the general perspective on the experience. In order to see the dimensions that resulted from the questionnaire, an explanatory factor analysis was carried out. The results of the KMO test show an index of .955 while the Bartlett's test of sphericity show a significance of $p < .000$. The items are therefore organised into the following areas:

1. **Contribution of feedback to academic tasks (C):** Cognitive and metacognitive aspects. The items refer to: the improvement of the individual's tasks; the improvement of group tasks; bringing value to the coursework; the consideration of the activity as a useful learning strategy; the integration of knowledge provided by the course; the clarification of doubts within the course; understanding the assessment criteria; becoming aware of the course objectives; gaining a better understanding of the tasks performed; understanding future tasks better; a better assessment of the student's own work; improved task planning; improved communication skills; learning in a more active way; and improving the opinion of assessments at the university.
2. **Rating of the peer feedback experiment (R):** The students' opinion on how useful the experience was. The items refer to: how useful the task was in improving peers' work; whether students consider feedback to be important for learning; the ability to compare one's own work with one's peers; grasping the responsibility of that comes with assessing; and seeing the importance of using different strategies with different tasks.
3. **Professional skills (inter- and intrapersonal) developed through the experiment (I).** The items refer to: improvement in teamwork competencies; improvement in the ability to effectively argue; improvement in peer communication; improvement in the ability to produce their own reasoning write a speech and to increase peer trust; improvement in peer acceptance; better assessments of peers' work; anxiety management; sense of belonging to a group; acceptance of errors; being responsible for one's own learning; general wellness, improvement of self-image; and being more assertive.
4. **Type of feedback (T):** Characteristics of the feedback given/received. The items refer to the content of the feedback: if it includes comments on the most important aspects of the activity; if the objectives of the task are mentioned; if the assessment criteria are considered; if the comments are transferable to other contexts; if both positive and negative aspects are included; and if mention is made of linguistic and stylistic aspects of the text and its structure.

Furthermore, the variables that are taken into account in the design of the activity are the conditions under which the peer feedback is applied. These include the following:

- **Privacy:** the anonymity or lack thereof of the assessor.
- **Contact between actors:** where and how the peer feedback is given/received.
- **The channel** of transmission and reception of the given/received feedback: oral, written or mixed.
- **The consensus** of the assessing group on the feedback offered.

In addition, the questionnaire included sociodemographic variables such as gender, age, how they were granted admission into the university, and the hours dedicated to the coursework and the peer feedback activity. The analysis of reliability confirms that the questionnaire is suitable for evaluating this experiment (Cronbach's alpha = .982).

Sample

The questionnaire was given to 504 students via the SurveyMonkey online platform at the end of the peer feedback activity. Out of the total survey pool, 410 students completed the questionnaire, thus presenting a participation rate of 80%. The students that responded to the questionnaire were approximately 20 years old (M = 20.67; SD = 2.59) and primarily female (84%), in line with

the total percentage of women in the study (UAB, 2019). As for the type of admission into the university, 68% came from university entrance examinations (PAU), 27% from Higher Vocational Training Qualifications and the remaining 5% from other types of admission. The learning task carried out by the group required an average dedication of 9.78h (SD = 14.37) and the time for task feedback to be developed, 5.28h (SD = 20.32). Since standard deviation is much higher than the mean, the medians and modes were also reviewed. With regards to the time dedicated to the task, the average is 7h and the mode is 10h; and regarding time dedicated to the feedback activity, both the mean and the mode are 3h.

Data analysis

Univariate and bivariate statistical analysis were carried out using the IBM Statistical Package for Social Sciences (SPSS v.20). Specifically, means and percentages were analysed for descriptive analysis, Pearson statistical tests were applied for correlations and the ANOVA test was used for comparing means for inferential analysis.

Results

The results below are organised into two blocks. First, the perception of peer feedback on student learning is explained: the benefits of giving and receiving feedback on student competence. Second, the results are presented related to the impact that different peer feedback design conditions have on student learning, such as privacy, contact, the channel employed and consensus.

Impact of peer feedback on students' learning

Of the students surveyed, 97% have previously been involved in feedback activities and 71.7% of them consider it to be a useful and helpful task. Specifically, the participants noted that having experience in peer feedback is helpful (26.8%), is quite helpful (22.2%) and is very helpful (22.7%) for participating in new peer feedback experiences.

Analysing the discriminatory variables and considering an assessment scale of 1 to 7, the students indicate that they are more satisfied with the feedback given (M = 5.78; SD = 1.06) than with the feedback received (M= 4.45; SD = 1.89); they also think that they have learned more by giving feedback than receiving it (M = 4.53; SD = 1.51).

Students generally agree that peer feedback is useful. They think that feedback is a necessary part of their learning process (M = 5.55; SD = 1.31), that it is a reasonable task (M = 5.06; SD = 1.27) and that both the time dedicated to it (M = 5.03; SD = 1.33) and the time available for carrying it out (M = 4.61; SD = 1.54) was adequate and sufficient. Furthermore, students note that they mostly agree with the comments received (M = 4.40; SD = 1.82) and show that they were able to incorporate them into revising their tasks before submitting their final version (M = 5.28; SD = 1.6). The result of applying the Pearson correlation coefficient indicates that: the response "*I agree with the comments received*" in the feedback correlate significantly and positively with "*I have incorporated the comments I received"* (r = .699, p < .000) and with "*I am satisfied with the feedback received"* (r = .841, p < .000). There is also a significant correlation (r = .692, p < .000) between the items "*I am satisfied with the feedback received*" and "*I have incorporated the comments received into the work carried out*".

The conditions for carrying out the peer feedback activity are described below (privacy, contact between actors, channel and consensus). In almost all cases, both the feedback given, and the feedback received were anonymous, so the students almost always knew who they were giving the feedback to (95.6% of the cases) and who they were receiving it from (95.1% of the cases). In more than 70% of the cases, the activity was not carried out face-to-face (71.1% giving feedback; 73.9% receiving feedback). The preferred channel used for giving feedback is in writing (59.8%). Consequently, it is also the most common way of receiving feedback (61.2%). Finally, 60.2 of the students who gave feedback, did so on a consensual basis with their work group, while 43.4% say that they received it individually and not in group.

In relation to the dimensions, Table 1 shows the mean for each dimension for giving and receiving feedback. In all cases, students give a higher rating to giving feedback than to receiving it.

Insert Table 1 here

Influence of the conditions of peer feedback application (privacy, contact, channel and consensus) on the perception of how useful it is for learning

In order to analyse the effect of the conditions of application, the ANOVA test is used for comparing the means of the four conditions, as well as differentiating between the cases where feedback is given and received in each of the dimensions. In summary, Table 2 shows the results for giving feedback and Table 3 outlines the results for receiving feedback.

Insert Table 2 here

Insert Table 3 here

Regarding the anonymity of the assessor – the conditioning factor of "privacy" – the results show that, in most cases, the mean is higher when the students assess their peers on a non-anonymous basis. On the other hand, the mean is higher when the students receive the feedback anonymously, without knowing who the assessment comes from. The exception in both cases is in the "type of feedback" dimension. In the case of giving feedback, the assessment is higher when the students give it anonymously (M = 5.43; SD = 0.65) than when they do it non-anonymously (M = 5.39, SD = 1.04) and in the case of receiving feedback, the mean is higher if the students receive feedback in a non-anonymous manner (M = 4.74; SD = 1.37) than if it is done in an anonymous way (M = 4.57; SD = 1.14). However, statistical tests show that there are no significant differences whether giving or receiving anonymous feedback in any dimensions of the study.

The results regarding the *contact between actors* – that is to say whether the feedback is delivered and received in person – implicate better evaluations of the feedback, across all dimensions, when practiced face-to-face (Table 6). When observing whether these differences between means are significant or not, the results show that, in the case of giving feedback, there is no significant difference between doing so face-to-face or not.

On the other hand, in the case of receiving feedback, there are significant differences in all of the dimensions between receiving feedback face-to-face or not. In this case, receiving feedback in person presents a significantly higher mean in all of the dimensions. Specifically, the contribution of feedback to academic tasks is significantly higher when it is received face-to-face [$F(1,357) = 9.704$, $p = 0.002$]; the evaluation of the experience is higher when the feedback is provided by other students face-to-face [$F(1,357) = 5.456$, $p = 0.020$]; greater development of professional skills is perceived when the feedback is received face-to face [$F(1,357) = 6.463$, $p = 0.011$]; and the means of the characteristic dimensions of the feedback are significantly higher when it is received face-to-face. [$F(1,357) = 14.003$, $p = 0.000$].

The channel for the transmission and reception of feedback is one of the most complex determining conditions, as it has three subcategories: oral, written and mixed. The results of giving and receiving feedback orally show a significantly higher mean in almost all of the dimensions. In the case of giving feedback, these differences are only significant in the dimension related to the type of feedback carried out [$F(1,378) = 7.069$, $p = 0.008$]. However, statistical tests show significant differences between receiving feedback orally or not orally in all dimensions: in contribution to the academic tasks [$F(1,357)=7.861, p=0.005$], the opinion of the experience [$F(1,357) = 6.327$, $p = 0.012$], professional skills [$F(1,357) = 8.349$, $p = 0.004$] and the type of feedback [$F(1,357) = 4.768$, $p = 0,030$]. In contrast, when the feedback is given in writing, it obtains lower means. Although there are no significant differences in the case of giving feedback, there are when receiving it (Table 3).

On the other hand, the mixed method of feedback (oral and written) obtains higher means both when giving and receiving feedback. Furthermore, the difference between the means is significant in all cases. Specifically, the student that gives mixed feedback feels that they have been able to contribute better to the academic task [$F(1,378) = 6.695$, $p = 0.010$] and to their professional skills [$F(1,373) = 8.978$, $p = 0.003$]; they also give more positive evaluations of the experience

[F(1,378) = 11.969, p = 0.001] and note that the type of feedback was more thorough [F(1,378) = 7.219, p = 0.008]. Similarly, in the case of the person receiving the feedback, the means are significantly higher for the dimension of contribution to the academic tasks [F(1,357) = 11.304, p = 0.001], those of evaluating the experience [F(1,357) = 10.201, p = 0.002], those of professional skills [F(1,357) = 7.823, p = 0.005] and those regarding the of feedback [F(1,357) = 8.422, p = 0.004] when it is received in a mixed format.

Finally, regarding the *consensus of the assessing group*, results, in all cases, show higher means when the feedback is both delivered and received in a consensual manner (Tables 2 and 3, respectively). The difference in means is not significant between the case of giving feedback as a group/consensus and that which is given individually, except in the type of feedback dimension, where the ANOVA test shows significant differences [F(1,378)=4.479, p=0.035]. That is to say that the items related to the feedback characteristics are viewed more positively when the feedback is agreed upon as a group and given as such.

The differences are, in any case, significant from the point of view of the person receiving the feedback. When they receive the feedback in a consensual manner rather than individually, students rate the following aspects more positively: the feedback's contribution to the academic tasks at hand [F(1,357) = 6.252, p = 0.013]; their evaluation of the experience [F(1,357)=5.562, p=0.019]; the development of professional skills [F(1,357) = 6.972, p = 0.009]; and the type of feedback received [F(1,357) = 9.095, p = 0.003].

Discussion and Conclusions

The study presented investigated: 1) the role of peer feedback in student learning, both when assessing and being assessed and 2) how the various designs of peer feedback affect the students' development.

First of all, the results of this study confirm that peer feedback is a useful assessment method that allows the student to commit to their own learning process, activate their prior knowledge and build knowledge (Gielen and De Weber, 2015 and Nicol et al., 2014). The results obtained acquire greater relevance if we consider that the participating students have previously carried out activities with peer feedback and can therefore compare this activity to their previous experience.

Secondly, in line with other studies (Ion et al., 2018; Zhu and Carless, 2018), this shows that the students think that giving feedback is more useful for the learning process than receiving it. The participants note that they gain more from giving their classmates feedback than from receiving their peers' comments. In the task of assessing, metacognitive variables (critical thinking, reasoning, memory, etc.) also come into play; this is reinforced when students state that they get more satisfaction from giving feedback than from receiving it. It is therefore important to motivate students and create stimulating tasks for them when planning feedback activities (Nicol et al. 2014).

Thirdly, the study shows that, in the process of learning through peer feedback, students realise that there are various conditions that can determine how effective it is. So, although the study demonstrates the perception that it is more useful to give feedback rather than to receive it, the conditions (privacy, contact, channel, consensus) have more influence when feedback is received than when it is given. The analysis of differences shows more significance in receiving feedback, so we conclude that it has more of an effect during the peer feedback process. By this we mean that the conditions of design for peer feedback have a greater impact when the feedback is being received and integrated than when it is being given.

Regarding the consensus, although there are no major differences, we can conclude that the feedback is seen to be more effective when it is agreed upon by the team and is received in a group, rather than individually. Forming a judgement in a group context creates a greater feeling of security and is better accepted. This further reinforces the idea that peer feedback is important for the collaborative learning process (Van Gennip et al, 2009).

In terms of anonymity, the findings suggest that the student who is receiving feedback prefers not to know who has assessed them and the person giving the feedback prefers not to know whose work they are assessing. However, as there is not a significant difference, there is no reason to state that anonymous feedback is more satisfactory than non-anonymous feedback. Students manage to connect with the activity and commit to the feedback task without being influenced by

privacy, either as the assessor or the assessed student. Furthermore, regarding the factor of contact between actors, whether the task is face-to-face or not does not affect to the improvement of the academic tasks, acquiring professional skills or how the experience is rated by the assessor. The effects of anonymity and of face-to-face contact in peer feedback is an interesting aspect, as previous studies show that it is one of the most important variables when assimilating the given feedback. When students are anonymous, they tend to offer more critical comments, as it allows the assessor to feel more secure and free to make value judgements and point out weaknesses in the work. When anonymous, the student can make comments the way that a teacher might (Panadero et al., 2018). The effect of anonymity may be different depending on other variables involved in the peer feedback and, the fact that there are not significant differences between anonymous and non-anonymous feedback leads us to believe that peer feedback has no negative social effects, nor does it have an impact on the role of the assessor or the assessed, as it focuses on the product-object of evaluation and not the person carrying it out (Panadero, 2016; Rotsaert et al., 2018).

However, a conditioning factor that should be considered is the channel through which the feedback is transmitted. The findings lead us to conclude that the feedback with the greatest learning potential employs a mixed method: one that includes written comments along with an oral explanation of the assessment. This is probably more effective because it offers the possibility to discuss and go deeper into the feedback given/received. It can therefore be said that people value personal interactions over anonymity (Van Den Berg et al., 2006; Van Zunder et al., 2010).

In this sense, we must bear in mind that although privacy and contact are not relevant determining factors, the channel *is*, which means that it is necessary to offer a space in which feedback can be given face-to-face and therefore in a non- anonymous way. Thus, to get the most out of the peer feedback task, it must be written and explained orally, thus encouraging clarification of comments, criteria and standards, thereby making the message more understandable (Van Den Berg et al., 2006; Van Zundert et al., 2010).

With regards to the four dimensions of the study, the most significant findings are found in the type of feedback, since this is where more significant differences are identified in both giving and receiving feedback. In this sense, it is important to train students on how to offer good feedback and how to make quality comments. The teacher's task therefore involves planning the structural design for a peer feedback process as an activity which is relevant for learning, considering training and offering the space and time necessary to carry out mixed-channel feedback: orally and in writing, even though this requires more time.

This study provides interesting results that can guide teachers in the design of learning situations that involve peer feedback. However, the study has several limitations, considering that it was carried out with a limited sample and that the experiment carried out is conditioned by the teaching team. Variables deriving from the context may have impacted the results presented in this study. Even so, we believe that the data gathered here provides an opportunity to compare results which –with the inclusion of other subjects – would be more complicated, since there would be more uncontrollable variables owing to the combination of content, methodology, teachers and activities.

Conflict of Interest Statement:

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Table 1. Mean of the dimensions studied in the aspects of giving and receiving feedback.

Dimensions	Mean Feedback given	Mean Feedback received
Contribution of the feedback to the academic tasks (C)	4.81	4.72
Rating of the peer feedback experience (R)	5.40	5.08
Professional skills (inter- and intrapersonal) developed through experience (I)	4.59	4.53
Type of feedback (T)	5.38	4.73
Global	5.045	4.765

*Grade on the Likert scale (1 to 7)

Table 2. Comparison of means of the conditions of application of the feedback given for each dimension.

Variable		Mean Giving-C	Mean Giving-R	Mean Giving-I	Mean Giving-T
Anonymous	Yes	4.43 (SD = 1.06)	4.98 (SD= 0.77)	4.36 (SD = 1.17)	5.43 (SD = 0.65)
	No	4.82 (SD = 0.97)	5.41 (SD= 0.93)	4.60 (SD = 1.06)	5.39 (SD = 1.04)
	Sig.	p < .171	p < .113	p < .443	p < .890
Face-to-face	Yes	4.93 (SD = 1.00)	5.48 (SD= 0.98	4.73 (SD= 1.09)	5.49 (SD= 1.07)
	No	4.77 (SD = 0.96)	5.37 (SD= 0.90)	4.54 (SD= 1.05)	5.34 (SD= 1.01)
	Sig.	p <.149	p < .295	p < .131	p < .218
Oral	Yes	5.21 (SD = 0.88)	5.78 (SD= 0.65)	4.84 (SD= 1.34)	6.03 (SD= 0.76)
	No	4.79 (SD =0.98)	5.38 (SD= 0.93)	5.58 (SD=1.05)	5.35 (SD= 1.03)
	Sig.	p < .085	p < .086	p < .319	p <.008
Written	Yes	4.75 (SD = 0.96)	5.34 (SD= 0.90)	4.52 (SD= 1.08)	5.34 (SD= 1.03)
	No	4.91 (SD = 0.99)	5.49 (SD= 0.95)	4.70 (SD= 1.03)	5.45 (SD= 1.02)
	Sig.	p < .121	p < .140	p < .109	p < .283
Mixed	Yes	5.07 (SD = 0.88)	5.73 (SD= 0.74)	4.92 (SD= 0.87)	5.67 (SD= 0.89)
	No	4.75 (SD = 0.99)	5.32 (SD =0.95)	4.51 (SD=1.09)	5.31 (SD= 1.05)
	Sig.	p < .010	p < .001	p < .003	p < .008
Consensus	Yes	4.85 (SD = 0.96)	5.47 (SD = 0.86)	4.63 (SD = 1.07)	5.47 (SD = 0.94)
	No	4.75 (SD = 1.00)	5.29 (SD = 1.01)	4.53 (SD = 1.05)	5.24 (SD = 1.15)
	Sig.	p < .295	p < .062	p < .355	p < .035

C = cognitive; R = rating; I = professional skills, T =type of feedback

Table 3. Comparison of means of the conditions of application for the feedback received for each dimension.

Variable		Mean Receiving-C	Mean Receiving-R	Mean Receiving-I	Mean Receiving-T
Anonymous	Yes	4.77 (SD = 0.74)	5.23 (SD = 0.61)	4.80 (SD = 1.14)	4.57 (SD = 1.14)
	No	4.73 (SD = 1.17)	5.07 (SD = 1.22)	4.52 (SD = 1.26)	4.74 (SD = 1.37)
	Sig.	p < .892	p < .623	p < .392	p < .647
Face-to-face	Yes	5.07 (SD = 1.04)	5.34 (SD = 0.99)	4.83 (SD =1.21)	5.21 (SD = 1.16)
	No	4.62 (SD = 1.17)	5.00 (SD = 1.25)	4.44 (SD =1.25)	4.59 (SD =1.39)
	Sig.	p < .002	p < .020	p < .011	p < .000
Oral	Yes	5.51 (SD = 0.92)	5.81 (SD = 0.70)	5.40 (SD = 0.99)	5.46 (SD = 0.99)
	No	4.69 (SD = 1.15)	5.04 (SD = 1.21)	4.49 (SD = 1.25)	4.70 (SD =1.37)
	Sig.	p < .005	p < .012	p <.004	p < .030
Written	Yes	4.58 (SD = 1.14)	4.96 (SD = 1.20)	4.40 (SD = 1.24)	4.59 (SD = 1.33)
	No	4.98 (SD = 1.15)	5.28 (SD = 1.17)	4.75 (SD = 1.24)	4.96 (SD = 1.39)
	Sig.	p < .002	p < .015	p < .009	p < .012
Mixed	Yes	5.16 (SD = 0.90)	5.50 (SD = 0.94)	4.92 (SD = 1.16)	5.17 (SD = 1.26)
	No	4.63 (SD = 1.18)	4.95 (SD = 1.23)	4.44 (SD = 1.26)	4.64 (SD = 1.37)
	Sig.	p < .001	p < .002	p < .005	p < .004
Consensus	Yes	4.90 (SD = 1.03)	5.25 (SD = 1.04)	4.73 (SD = 1.13)	4.98 (SD = 1.24)
	No	4.60 (SD = 1.23)	4.95 (SD = 1.30)	4.38 (SD = 1.32)	4.55 (SD = 1.42)
	Sig.	p < .013	p < .019	p < .009	p < .003

C = cognitive; R = rating; I = professional skills, T =type of feedback