

Interaction, feedback and active learning: where we are and where we want to go

Interazione, feedback e apprendimento attivo: a che punto siamo e dove vogliamo andare

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1. Theorising on feedback, learning and technologies

Over the last years, educational research has put a significant amount of effort into exploring the potential of interaction and feedback to support active learning as a student-centred approach where students participate in the learning process through discussion, practice, problem solving, group work and so on (Prince, 2004; Winstone, Nash, Parker, & Rowntree, 2017). Learner-centred pedagogies, indeed, are seen as pivotal for the development of higher-order cognitive skills such as critical thinking, problem solving and design thinking, which in turn are related to the capacity of facing the increasing complexity of our societies.

Scholars from different backgrounds have emphasised the value of feedback and interaction in active learning environments, especially to mobilise prior knowledge (Hattie & Shirley, 2019), to attenuate cognitive overload (Sweller, 1994), to reduce the “discrepancies between current understanding or performance and a desired goal and knowledge” (Laurillard, 2012, p. 83), to stimulate the awareness of cognitive conflicts as well as the production of a network of meanings (Rivoltella & Rossi, 2019) for promoting self-regulation processes and revision of conceptual knowledge (Laurillard, 2012). Therefore, suggestions are given to overcome the *empathy gap* between teachers and students about the perception of how feedback is delivered to make it more effective (Hattie & Timperley, 2007; Hattie & Yates, 2014). Interaction between the learner and the environment defined by the teacher, instead, is one of the main dimensions of the Laurillard (2002) conversational framework and, more generally, of interactionist models: from this perspective, teachers have the responsibility for creating an environment adapted to the learning task which is given to the learner and for providing appropriate feedback.

Consistently with these theoretical and empirical advances, colleagues from across the university, and more widely teachers and instructional designers, are using technologies and reshaping learning spaces, including physical and virtual classrooms, to transform teaching and the ways in which our students engage with learning (Tonelli, Grion, & Serbati, 2018). Technologies, indeed, are becoming ubiquitous thus enabling new forms of interactivity regardless of location. Due to this increased interactivity, we need to rethink our types and modes of feedback within the hybrid classrooms of the 21st century.

In this context, this special issue aims at stimulating a reflection on current approaches to feedback for teaching and learning, with a focus on what works and what does not as well

as on the main research directions to undertake in the near future. To this purpose, it collects different types of papers, including review papers, research articles, conceptual essays and case reports on specific teaching and learning experiences that are introduced below.

2. Researching feedback, ICT and active learning

The issue opens with two review papers on feedback in higher education, a setting which is receiving increasing attention from both researchers and policy makers due to the pivotal role that universities play for the growing up of contemporary knowledge societies (McAleese et al., 2013). Feedback is seen as a key component to improve the quality of teaching and learning (Grion, Serbati, Tino, & Nicol, 2018; Nicol, Thomson, & Breslin, 2014), including the adoption of Information and Communication Technologies (ICT) (Tonelli, Grion, & Serbati, 2018). This aspect is specifically explored in the first paper, titled *Feedback with technologies in higher education: a systematic review* by Chiara Laici and Maila Pentucci. The article provides an overview of the literature that has been produced in the last three years on the use of different types of Student Response Systems in university classes highlighting the role that digital technologies may play in supporting “multidimensional, multidirectional and transformative” approaches to teaching and learning in higher education. The review shows how challenging adopting ICT is to this purpose: it requires the design of “complex training ecosystems” where transmissive views of teaching give way to active strategies of students’ involvement and more dialogical postures among students and between teacher and students, leading to increased collaboration in design and knowledge construction.

With a shift from undergraduate to doctoral programmes, Liliana Silva and Massimo Marcuccio, investigate the function of tutor’s feedback to PhD students. Specifically, through their narrative review titled *Advisor’s Feedback as assessment practices in Doctoral Programs: a scoping review of empirical research*, the authors present and discuss the results taking into account “the level, degree, and method of delivery” as well as “the ability to promote active learning processes”. Moving from “a definition of formative feedback within an interactionist context” supporting “the autonomy and active learning of the students involved”, the analysis shows that “reinforcement feedback” prevails during the course; it also points out the emerging needs relating to better practices of assessment, including active feedback, self-assessment and computerised feedback models.

Moving from the state of art to new directions, feedback automation in the era of big data and large-size university classes is gaining renewed attention. On one hand, the availability of large amounts of data gathered from humans using digital devices is opening the way to new opportunities for personalisation, which entails continuous adaptation based on feedback received from the users. Although there are also controversial issues relating to personalisation (Bulger, 2016), more inclusive learning paths can be conceived when the learning system is more acquainted with the characteristics of the users. On the other hand, university settings are increasingly characterised by large-size classes where promoting active learning and higher-order thinking skills becomes really challenging. A certain degree of automation may facilitate interaction and an increased level of reflection. It sounds like a contradiction. However, automation does not entail the end of the human governance and direction. At least, until now. A vigorous debate on the topic is ongoing (Floridi, 2014).

Interest in developing automatic forms of feedback is the subject of two subsequent papers, that is *Developing a web App to provide personalised feedback for museum visitors: a pilot research project* by Antonella Poce, Maria Rosaria Re, Francesca Amenduni, Carlo De Medio, Mara Valente, and *Road to Critical Thinking automatic assessment: a pilot study* by Antonella Poce, Francesca Amenduni, Carlo De Medio and Maria Rosaria Re. In the first study the role of feedback is linked to the personalisation of learning in informal educational settings such as museums which are increasingly providing visitors with mobile applications to improve their cultural experiences, attract new visitors and reduce the barriers for special needs users. The paper presents the results of a pilot test of a web app aimed at building personalised learning paths in the *Tito Rossini* exhibition. The user test led to the conclusion that participants appreciated multimodality and that certain users' preferences and personal traits are associated with fruition styles, suggesting that automatic forms of feedback may be implemented successfully.

As for the second paper, it examines the potential of automated scoring in assessment processes of critical thinking. The authors argue that while essays and open-ended questions are traditionally recognised as crucial for Critical Thinking assessment, they raise issues related to inter-rater reliability and high-cost of scoring. The paper presents a research and development study where a prototype for automatic assessment of Critical Thinking is tested. Based on Natural Language Process techniques, it shows how automation may be consistent with the development of higher-order thinking skills.

Another area that gives a glimpse of meaningful developments is connected with the use of feedback in collaborative learning contexts where peer reviewing and/or peer grading are at the centre of peer-feedback and/or peer-assessment practices. ICT may support these procedures enabling different forms of feedback as well as different ways of managing peer-to-peer processes. However, there are several controversial issues that are worth considering. Who/What is giving the feedback to whom/what? To what extent are students, involved in collaborative practices of peer-feedback and/or peer assessment, culturally comfortable with a flipped perspective where students become teachers? How can collaborative practices of feedback and assessment fit with traditional settings and approaches to teaching?

In the article, *The utility of written corrective feedback in L2 learning: Analysis of an experience with Erasmus Incoming Students*, Silvia Gasparini analyses "the effectiveness of peer-delivered corrective feedback" in a programme addressing Erasmus students learning Italian as a second language. Different ways of providing written feedback are considered including the direct substitution mode, indirect feedback through metalinguistic codes and the indirect feedback mode based on concrete examples. The results indicate that indirect peer feedback is more effective than direct feedback in the long term.

Grounded on international literature and studies on peer assessment carried out both at university and school level, in the article *IMPROVe: Six research-based principles to realise peer assessment in educational contexts* by Anna Serbati and Valentina Grion, the authors illustrate the six principles they have elaborated to design and implement peer assessment activities to nurture active learning in different educational settings. The first principle underlines the relevance of sharing and co-constructing evaluation criteria. The second principle suggests identifying worked examples which may serve the purpose of exemplars of the expected outcome. Generating feedback among peers is the third principle, highlighting the need to provide instruments and tools to stimulate peer evaluation processes. The fourth principle is receiving feedback, meaning that students need to be supported in understanding how to implement the feedback obtained, or in other

words how to revise their work according to the feedback received. The fifth principle invites providing students with appropriate learning contexts to apply peer assessment while the sixth and last principle points out the new role that teachers perform when assessment involves peers and collaborative strategies.

The last paper in the section collecting scientific articles is *Assessing is not a joke. Alternative assessment practices in higher education* by Margherita Di Stasio, Maria Ranieri and Isabella Bruni. With the aim of exploring the formative value of alternative assessment practices, the paper presents the results of a study carried out in the higher education context where assessment techniques were adopted and examined in terms of their validity and students' perceptions. While validity was sufficiently ensured, meaning that students' and teachers' grades were generally close, students showed their concerns about alternative approaches to feedback and assessment, particularly because they are used to associating assessment to summative rather than formative views.

3. Practising feedback, ICT and active involvement

This section including case study reports and experiences highlights the different forms that feedback can take ranging from visual feedback to handwritten comments, to direct verbal feedback and immediate feedback delivered through online learning platforms. The diverse practices described here witness the variety of opportunities that multimodality and multi-media can afford. In this regard, the paper *Images-feedback in university teaching* by Chiara Panciroli and Anita Macauda shows how visual feedback offered in a virtual learning environment may promote active learning, particularly from the cognitive, socio-relational and emotional point of view with positive implications for students' motivation.

In *Exploring the possibilities of automated feedback for third level students* by Ian Clancy and Ann Marcus-Quinn, the authors suggest that increased levels of self-direction in the management of learning processes entail augmented demand for qualified feedback. As an answer, the use of a free open source solution is proposed as a means to provide positive and timely feedback generating benefits for students' involvement.

With their paper *Enhancing a blended module in General Didactics: new contents, materials, forms of assessment and feedback*, Lilia Teruggi, Franca Zuccoli and Francesca Bassi document the results of a blended course in a programme of teacher education where better interactions between teachers and students as well as among students improved the overall experience. The promotion of peer education, new types of assessment, and the delivery of feedback related to individual learning activities were all crucial.

The section ends with the paper *Promoting historical memory recovery through the feedback given by educational Museums and Laboratories* by Vittoria Bosna. Exploring the potential of the "pedagogy of heritage", the author suggests that educational museums can be seen as cultural artefacts mediating access to knowledge. In this perspective they may serve the purpose of creating feedback between the past and the present.

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