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Indice

The "Trialogical Learning & Assessment Approach": Design principles for higher education

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Abstract

The exceptional historical period we have experienced in years 2020-2022 has made evident the need to rethink university teaching through a thoughtful integration of in-presence and online activities, in which to enhance participatory learning practices. To this aim, according to the *Assessment for Learning (AfL)* and to the *Sustainable Assessment (SA)* frameworks, teachers should conceive students' assessment as an integral part of the teaching-learning process. The *Trialogical Learning Approach (TLA)* has so far proved to be an effective learning design model: its six Design Principles (DPs), in fact, have supported many university teachers in planning meaningful technology-mediated learning activities. Yet, the trialogical principles seem to fail in considering students' assessment practices.

The aim of this contribution is to show how, though not explicitly mentioned in the TLA theory, the assessment components are extensively included throughout a trialogical university course. By following a practice-based research methodology, we considered trialogical university courses previously documented by different authors. Observing the course implementation from an AfL and SA perspective,

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we retrieved the precise assessment components disseminated in each trialogical DPs. Thus, we could go back to the original TLA theory and propose its broadening in an assessment perspective, which we called *Trialogical Learning & Assessment Approach*.

Keywords: Trialogical Learning Approach, Assessment for Learning, Sustainable Assessment, Higher Education, Practice-Based Research.

If we want to focus students' effort and improve their engagement with learning, a key locus of enhancement can be refreshing our approaches to assessment and sometimes we need to take a fresh look at our current practice to make sure assessment is for rather than just of learning (Brown, 2018, p. 87).

Introduction

One of the main objectives of Higher Education (HE) is to ensure that students acquire useful skills to achieve success not only in their studies but also in their future professional careers and life in general. To this aim, teachers should design their courses focusing not just on the contents, rather on the whole teaching/learning experience. The socio-constructivist approach combines technology and educational contexts to promote collaborative, constructive, and meaningful learning through students' active role (Jonassen, 2006; Scardamalia & Bereiter, 2006), both in face-to-face as well as in online or mixed educational settings.

Changing the educational paradigm implies the adoption of assessment models able to consider the combination of new and different dimensions that come into play: processes and products, individual and group, mediation tools and actors. A shift is thus needed from a positivist evaluation aimed at quantitatively certifying the learning outcome at the end of the course, towards a constructivist assessment that becomes itself part of the didactic strategies in the form of observational activities, authentic tasks, and experiencing of critical skills.

The Trialogical Learning Approach: a model to design meaningful technology-enhanced learning practices

A model considered as suitable for promoting new ways of thinking, working, and living in the world – therefore able to enhance HE – is the Trialogical Learning Approach (TLA) (Paavola & Hakkarainen, 2005) (Figure 1), recently counted by the Italian Ministry of Education as one of the PNSD (National Digital School Plan) *best practices*[1].

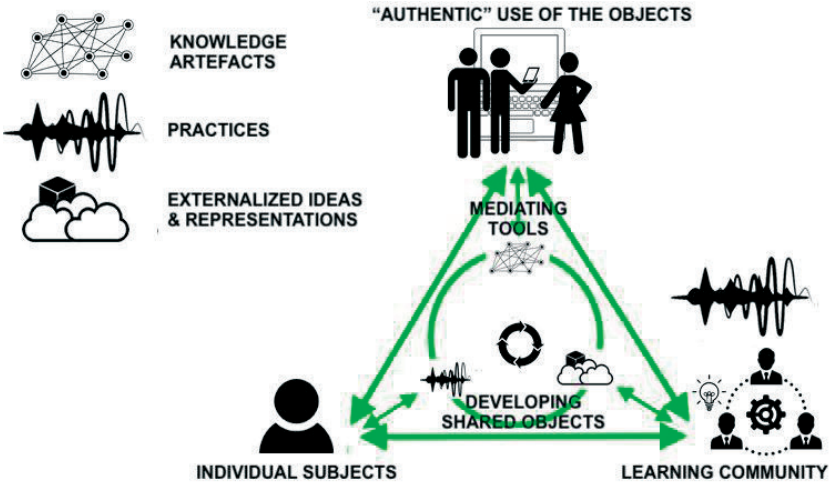

Figure 1. The Trialogical Learning Approach

As it is shown in Figure 1, the approach is *trialogical* in the sense that it integrates "monological" (i.e., individual knowledge and conceptual processes) and "dialogical" (i.e., distributed cognition and social/material interactions) approaches, with a third element: the intentional processes involved in collaboratively producing knowledge artifacts that are shared and useful for the community.

TLA rises from the socio-constructivist framework and systematizes it in a coherent system of so-called Design Principles (DPs;

[1] D.M. 147, April 30th, 2021

Paavola & Hakkarainen, 2014), which are meant to support the planning of teaching and learning activities:

- DP1. Organizing activities around shared '*objects*',
- DP2. Supporting interaction between personal and social levels and eliciting individual and collective agency,
- DP3. Fostering long-term processes of knowledge advancement,
- DP4. Emphasizing development through transformation and reflection between various forms of knowledge and practices,
- DP5. Cross fertilization of various knowledge practices across communities and institutions,
- DP6. Providing flexible tool mediation.

Following the six trialogical DPs, research show how teachers could plan university courses able to promote students' meaningful learning of both knowledge and skills (Impedovo et al., 2018; Ligorio et al., 2021; Sansone et al., 2016a,b; Sansone et al., 2021). Yet, when it comes to the students' learning outcomes, TLA and its DPs do not explicitly dwell on assessment practices and process, thus leaving the field open for reflection and advancement.

Assessment as a key lever of the teaching-learning process

The influence of assessment practices on how and what students learn was already clear since the early 90's, when David Boud stated:

Assessment acts as a mechanism to control students that is far more pervasive and insidious than most staff would be prepared to acknowledge (…). If, as teachers and educational developers, we want to exert maximum leverage over change in higher education we must confront the ways in which assessment tends to undermine learning (Boud, 1995, p. 35).

Many other scholars have since shown the extent to which assessment approaches and techniques impact on students' behavior with respect to their commitment and motivation, focus on the topics of learning, and skills developed in relation to a course. According to Bloxham and Boyd (2007), for instance, the assessment activity overlaps with the learning activity. Although students are actively engaged by taking

notes during lessons, following the scheduled seminars or carrying out the learning assignments, it is only when they are getting ready for the final evaluation, or are engaged in *in itinere* assessment activities, that most of them deal seriously – and perhaps more effectively – with the study material. Biggs and Tang (2011) recognize, however, that inappropriate evaluation approaches can induce "superficial" forms of learning or even worse consequences. Performing only short-answer and multiple-choice tests, providing insufficient time to perform tasks, emphasizing the speed of resolution rather than the depth and originality of the solutions, stimulates excessive anxiety or low expectations of success. On the other hand, appropriate assessment approaches can lead students to experience positive feelings: motivation, challenge, euphoria, and a general sense of being important. Ultimately, a rightful assessment consolidates the development of adequate learning strategies and reinforces the sense of personal achievement and the willingness to complete the assignments (Cinque, 2016).

Within this framework – as Sambell, McDowell and Montgomery (2013) stress –, a *good* assessment can have a much more positive effect on learning, if it is deeply aligned with (Biggs & Tang, 2011), and integrated into the teaching-learning process, so to fully engage students (Sambell et al., 2019). Thinking assessment only as the final moment of the teaching-learning process, in fact, constitutes a wasted educational opportunity (Brown, 2018). Thus, some authors have redefined the concept of "formative assessment" as *Assessment for learning* (AfL) (Black & Wiliam, 1998), a framework conceiving the assessment practices as actual learning activities in which students' active role is emphasized (Black et al., 2004). According to Boud (2000), the contribution of such assessment methodologies goes beyond the time scale of a given course and towards a *lifelong* learning, i.e., the "*ongoing, voluntary, and self-motivated pursuit of knowledge for either personal or professional reasons*" (Department of Education and Science, 2000). This is the main pillar funding the *Sustainable Assessment* (SA; Boud, 2000) approach, for which a sustainable assessment is the one meant to bridge the gap between assessment and learning, by promoting students' self-regulation and ability of making judgements about their own work.

Being able to effectively assess their own learning is not a state they will achieve at a particular point in time, but one which will need to be continually reworked throughout their lives as new and anticipated challenges present themselves. Students thus equipped will be able to contribute to their own learning and that of others. As part of being lifelong learners they will be effective lifelong assessors (ivi, p. 151).

Suggestions from the AfL and SA frameworks have been translated into various intervention models (Grion & Serbati, 2019). AfL- and SA-based models are mainly focused on how to concretely favor a positive culture of assessment through peer-assessment activities. The merit of these models is to come with principles of practice guiding the teachers who are willing to apply these theories, such as in the case of the IMPROVe (Serbati & Grion, 2019) model of practices. The IMPROVe principles specifically encourage the designing of peer-assessment activities in which the following steps are requested: "I" – *Interpreting assessment criteria together*, "M" – *Mapping the exemplars: strategies for using "model" assignments*, "P" – *Producing feedback*, "R" – *Receiving feedback*, "O" – *Offering students learning contexts appropriate for peer assessment activities*, "VE" – *diVErsifying the role of the teachers in a lifelong learning perspective*.

Trialogical Learning, Assessment for Learning, Sustainable Assessment: what twists and turns?

Although developed in different cultural contexts and with different pedagogical purposes, it seems to us that TLA (Paavola & Hakkarainen, 2005) and the most recent perspectives on assessment, namely AfL (Sambell et al., 2013) and SA (Boud, 2000), share numerous features. To sustain our intuition, we adopted a practice-based research methodology (Fielding, 2001; Wubbels et al., 1997). We therefore considered TLA-based university courses previously documented by different authors (see the subsequent sub-paragraphs). For each course we analyzed TLA DPs implementation from an AfL and SA perspective and pointed the assessment features out. Once we had identified at

least two AfL and SA features for each DP, we considered our goal as reached.

In the following sections, the assessment components of each trialogical DPs are listed by the mean of exemplar practices.

DP1: Organizing activities around shared objects.

TLA DP1 requires teachers to design learning activities leading to the collaborative creation of shared *objects* intended for actual use. From an assessment point of view, the trialogical *object* thus acts as the "*authentic task*" that the students are required to perform; as such, it is not meant for mere summative evaluation, rather it should embody students' acquired skills and knowledge. In the professional training course for osteopaths documented by Sansone et al. (2016), the final *object* to be built within the Physic curriculum was the *Fisicario*, a multimedia guide about osteopath treatment techniques. Each technique was accompanied by informative material. (video, audio, images) chosen from the students to explain the underlying principles of physics. From the quality of the final product (e.g., accuracy, completeness, organicity etc.), the teacher was able to grasp students' knowledge acquisition and to assess them coherently.

A trialogical *object* is negotiated between teachers and students at the beginning of the process. Students participate in defining its final shape, functions, and target, till they also identify the quality criteria to be used (as in principle "I" of the IMPROVe model). This was the case of the Experimental Pedagogy course for junior psychologists (Sansone et al., 2021) in which students were asked to build a "*Pedagogical Scenario*", i.e., an educational project to be carried out in a school or in a university classroom. Part of the work required of the students was just to define the context, objectives and targets of their scenario. Furthermore, before releasing the final version, students had to identify the quality criteria based on which to comment on the preliminary version and make any improvements.

The shared definition, implementation, and evaluation of the learning product (the *object*), represents the central element of the

whole process, both at a didactic as well as at an assessment level. Following these suggestions, many trialogical objects have been so far planned, built, and disseminated at any level of schools and university (Sansone et al., 2016a): from digital (websites, web apps, multimedia learning contents and tools, eBooks) to material (booklet, measurements tools) or immaterial (showcase, design, rubrics, protocols to be used in actual contexts) artifacts.

DP2. Supporting interaction between personal and social levels.

This DP highlights the need for didactic actions that favor a fruitful alternation and integration of individual and group agency. Studies published over time (Cesareni & Sansone, 2019; Sansone et al., 2020) have shown how the activities and strategies introduced to support this DP also elicit strong reflective processes. During the group-work, the future psychologists studying Experimental Pedagogy covered in turn some roles to strengthen individual participation. One of the assigned roles was the "*observer*". The student carrying this role had the weekly task of compiling a semi-structured grid in which to report and comment on the performance of his/her own group and to provide useful tips to go ahead. Thus, an individual "*assessor*" – a complementarily role – supported the group-work.

Conversely, learning activities such as the negotiation of the assessment criteria or the mapping of exemplars (respectively principle "I" and "M" of the IMPROVe model) involve phases of individual work and of group activities, in which to discuss and negotiate one's points of view and ideas with his/her peers. The future osteopaths not only had to collaboratively identify the quality criteria based on which to monitor and assess their "*Fisicario*", but they were also requested to search for similar products – built from professionals – and to use them as terms of comparison to evaluate their own *object* through the mean of repeated sessions of group-discussion.

Moreover, to further strengthen the positive interdependence within groups (Johnson et al., 1998), balanced assessment systems have been implemented in the trialogical HE courses that we ob-

served. In the case of the Research Method course for Social Studies (Lakkala et al., 2015), teachers developed *ad hoc* protocols able to consider both the individual and the group contribution, thanks to a mixed system of data to be assessed: from personal learning outputs (reviews) to collective ones (PPTs), from individual roles (reporter) to group ones (researchers). Similarly, in the case of the eLearning Psychology course, the teacher finalized a grid-based protocol including the individual and collaborative artifacts/processes to be assessed, thus reflecting both the complex trialogical architecture of the course and the strong intertwine between personal and social levels (Sansone & Ligorio, 2015).

DP3: Fostering long-term processes of knowledge advancement.

TLA DP3 states the importance of providing students with enough time for long-term processes to take place in which to iteratively improve knowledge and artifacts. Peer-assessment models, starting from the IMPROVe itself, perfectly meets these intentions. Many learning activities have been accordingly implemented in the trialogical courses that we explored, from simple mutual comments to structured peer-assessment sessions. Both in the Research Method and in the Physics course, students were repeatedly invited to provide their colleagues with comments about the progress of the knowledge artifacts to be created. Comments and suggestions were elicited during classroom brainstorming.

The Experimental Pedagogy students, instead, performed structured collaborative peer-assessment sessions (Cesareni & Sansone, 2019), including the following steps: a. observe and discuss other groups' intermediate products assigned by the teacher (i.e., conceptual maps and pedagogical scenarios); b. define appropriate criteria for assessing them; c. for each criterion, provide the colleagues with constructive feedback on how to improve the product; d. analyze the received assessments and accordingly revise their own products. This sequence of activities was repeated in each of the three modules constituting the course.

Beyond explicit peer-assessment practices, the trialogical courses that we observed share many features able to promote the continuous improvement mindset solicited from DP3 (Lakkala et al., 2015; Ligorio et al., 2021; Sansone et al., 2021): a. a modular structure to facilitate an adequate repetition of procedures and practices; b. a recurring reflection about the creative and collaborative processes; c. the making of the final object through intermediate products and preliminary versions. Through all these features students are provided with adequate times in which to build and reconstruct knowledge, bring out misconceptions, readjust awareness, implement processes of comparison and self-assessment (Li & Grion, 2019; Panadero et al., 2019).

DP4: Development through transformation and reflection.

TLA DP4 requires the learning environment to be characterized by a multiplicity of sources, just as AfL processes (Panadero & Lipnevich, 2022). Going beyond the sole declarative knowledge, in fact, aims to promote students' knowledge transformation and to enhance reflection. This broad indication has been concretely applied through the introduction of diversified tools and procedures (e.g., digital portfolios, learning diaries, expert advice, and peer discussions). Through these AfL devices, reflective processes have been supported in a double direction: towards the "outside", which is represented by the product that is being created, and/or towards the "inside", that is to say one's own learning path and participation in the class and group activities.

In the eLearning Psychology course, students are asked to build and maintain their personal e-Portfolios, that is, a digital folder in which to upload: a) information about themselves (e.g., photos, notes, links), b) expectations and learning goals concerning the course, c) a selection of the best outputs and activities that they think to have performed, accompanied by an explanation about the criteria used to select certain products rather than others (Ligorio et al., 2021). Moreover, to help students improve their own portfolio, the role of "*Friend of Zone of Proximal Development*" is assigned to a colleague. Through

a structured task and time frame, students covering this role are requested to offer peer scaffolding and immediate feedback (Impedovo et al., 2018).

In the Experimental Pedagogy course, at the end of each module students are asked to fulfill a self-monitoring questionnaire, a device purposely built with a twofold aim: to trigger students' reflection upon the learning outcomes that they have achieved; and to collect specific feedback about each module that the teacher could consider in redesigning the course (Sansone et al., 2021). In a Media Engineering course, the teacher asked the students to produce self-reflection reports on both the individual and the team experience. Since the reflective reporting activity was deemed as crucial for their learning, the teacher included the report assessment in the students' final grade, in addition to considering their participation in the actual project work (Lakkala et al., 2012).

E-Portfolios, questionnaires or self-reports, they all can be seen as the "*comparators*" useful for stimulating "*generative internal feedback*" (Nicol, 2020, 2021; Serbati et al.,) in which the "*cognitive change*" – i.e., the learning would actually take place.

DP5: Cross fertilization of various knowledge practices.

TLA DP5 reflects the need to create connections beyond formal learning contexts to promote the acquisition of tools, practices, and discourses from different sources. From an assessment point of view, the introduction of professional practices and/or tools provide students with a diversity of *stimuli*/comparators that activate the assumption of several perspectives and the acquisition of different ways of operating and reasoning (*ibid.*). In the Media Engineering course (Lakkala et al., 2012), for instance, students were requested to apply collaborative design practices and project-based learning methods to solving the practical problems of media technology. Moreover, they were provided with conceptual and material tools, like project work models and document templates that mediated true professional practices.

AfL practices, however, come into play also directly in the application of DP5 of the HE courses that we analyzed. In the eLearning Psychology course students' activities led to the final building of Learning Objects (LO) targeted for real companies, whose representatives accompanied the students all along the process. First, companies' representatives specified the LOs main requirements and negotiated the features with the students; then they offered suggestions and/or reasoned feedback on the areas of strength and improvement; in the end, they provided the students with a final assessment of their LOs. In the Experimental Pedagogy course, professional practices and/or tools are introduced at different stages of the process: a. when students experience rubrics and criteria typical of the educational professional world, b. when the group-works revise their pedagogical scenarios through a negotiated process in which the experts (teachers from school and university) teach to the novices (the students of the course).

DP6: Providing flexible tools mediation.

This DP emphasizes the importance of providing students with digital tools and environments able to support the development of each other DP, therefore also of the above highlighted assessment processes: from tools for synchronous and asynchronous mutual feedback to environments to build and apply peer-assessment rubrics, and so on. After all, mediation is the very heart of TLA (Paavola & Hakkarainen, 2014), beyond technologies and up to the role of the practices and actors involved in and mediating the learning process. The same mediation is the one recalled by the IMPROVe model of practices which conceives the teacher as the one in charge of ensuring the development of a mature students' *assessment literacy* as a tool of *lifelong learning* (Boud, 2000). Towards this direction, once again, the HE courses here reported have implemented specific use of the mediation tools with the aim of both supporting students' assessment activities as well as of monitoring students' participation. In the Experimental Pedagogy course, for instance, tools such as Google Module were

used to administer the periodic self-monitoring questionnaire, whereas Padlet hosted reflective brainstorming taking place during classroom activities. Moreover, students have been monitored through an integrated system in which the platform quantitative learning analytics (i.e., Moodle reports) were mediated by the teachers' qualitative assessment of students' process and products (Sansone et al., 2020).

The "Trialogical Learning & Assessment Approach".

After exploring several HE courses, the connection points between TLA, AfL and SA appear to be evident: from the centrality of students' active role to the need of promoting continuous framing and reframing activities of their learning, from the alternation of individual and social work phases to peer-assessment as a key to enhance a *lifelong* learner's attitude, from a learning experience rich in *stimuli* and exemplars to the mediation role of teachers and tools. Exploring the practices therefore led us to refine the theory (Fielding, 2001; Wubbels et al., 1997) and to reframe TLA into an enhanced version which we called the *Trialogical Learning & Assessment Approach* (TL&AA), meant to emphasize the centrality of virtuous Afl and SA practices in a trialogical experience.

The following table (Table 1) summarizes the main assessment features emerging from each trialogical DP in action.

Table 1. The Trialogical Learning & Assessment Approach

TLA Design Principle	Assessment for Learning and Sustainable Assessment features
1. Organizing activities around shared 'objects'	Shared definition, implementation, and evaluation of the learning product/object informing the didactic experience and representing the "authentic task"
2. Supporting interaction between personal and social levels and eliciting individual and collective agency	Individual and collaborative evaluation&learning activities: "monitoring" student-roles, balanced evaluation, shared definition of assessment criteria

3. Fostering long-term processes of knowledge advancement	Framing and re-framing knowledge through long-term processes of reciprocal feedback and products revisions
4. Emphasizing development through transformation and reflection between various forms of knowledge and practices	Offering many *stimuli*/comparators to promote self-feedback generation: digital portfolios, learning diaries, expert advice, and peer discussions
5. Cross fertilization of various knowledge practices across communities and institutions	Ensuring multiple sources of *stimuli* in the educational context to support reframing and hybridization: external experts and final users providing students with feedback and/or requests
6. Providing flexible tool mediation	From digital tools and environments sustaining evaluative process to the teacher ensuring the development of a mature evaluative literacy in students

The conceptual shift from TLA to TL&AA aims, on the one hand, at recognizing TLA assessment features which were not originally valued by the authors. On the other hand, it confirms how emerging assessment practices can be rightfully recognized as teaching/learning tools and/or methodologies.

Conclusions

The exceptional historical period we have experienced since 2020, due to the pandemic Covid-19, has made evident the need to rethink university teaching and assessment through the introduction of participatory practices in which to encourage students' agency, responsibility, and creativity (Grion et al., 2020; Ritella & Sansone, 2020). Towards this direction, the authors propose the introduction of an integrated teaching-learning and assessment model: the Trialogical Learning & Assessment approach (TL&AA), in which sustainable and formative assessment processes are *in itinere* enhanced. This model is the result of a re-reading of the Trialogical Learning Approach (TLA) (Paavola & Hakkarainen, 2005) in the light of the recent Assessment for Learning (AfL) (Sambell et al., 2013) and Sustainable Assessment

(SA) (Boud, 2000) frameworks. Starting from the trialogical practices implemented and documented at a university level, the authors highlight the AFL and SA components. Ultimately, we can consider as TL&AA courses those in which a meticulous design explicitly provides students with frequent AfL activities.

Although the reflection here proposed is practice-based, numerous studies have already revealed the effectiveness of TL&AA strategies. Research shows how a thoughtful design of diversified trialogical assessment activities led the students to develop critical reflective skills (Sansone et al., 2020) and an increasing ability to receive and offer constructive feedback (Sansone & Cesareni, 2019), with the result of promoting a broader *assessment literacy* (Boud, 2000). This is, for instance, the case of HE courses in which students' ePortfolios proved to act as border artifacts between learning and professional contexts (Impedovo et al., 2018; Nicol et al., 2019). In other case (Sansone & Ligorio, 2015), using *ad hoc* assessment protocol revealed to sustain students' continuous improvement, as stated in the following excerpt:

> Often, we see a job of a few months liquidated in a few moments. For us it is much more useful to have an assessment in progress. This really helps us understand our weak points… Tomorrow I will go back to my products and do a further analysis of them in light of your assessment.

In conclusion, following Wubbels et al. (1997), we believe to have found a "*practical theory*" in which to combine theory and situated action, in order to improve educational practices. Subsequent studies are now needed both to systematize the research results related to specific TL&AA strategies, as well as to define implementation models that can be easily transferred from one context to another.

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