

ENGAGE Students in formative peer assessment to support learning

ENGAGE: coinvolgere gli studenti nella valutazione formativa tra pari per supportare l'apprendimento

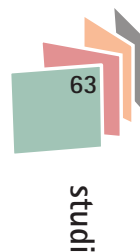
Lan Li • Bowling Green State University • Ohio, USA

Despite its well documented potential in facilitating student learning, formative peer assessment also faces a few challenges, including peer pressure, time on task, and students' incompetence of understanding marking criteria and conducting critical assessment. The paper presents a model that aims to engage students in formative peer assessment while overcoming obstacles and tackling noted challenges.

Keywords: peer assessment model, formative assessment, learning engagement

Nonostante le potenzialità, ampiamente documentate, nel facilitare l'apprendimento degli studenti, la messa in atto di attività di valutazione fra pari implica la necessità di affrontare alcune sfide quali l'imbarazzo degli studenti nel valutarsi reciprocamente, le loro scarse competenze nella comprensione dei criteri di valutazione, i tempi di lavoro. L'articolo presenta un modello già sperimentato, diretto a coinvolgere gli studenti in attività di valutazione formativa fra pari, che permette di superare i suddetti ostacoli e vincere quelle sfide.

Parole chiave: modello di valutazione fra pari, valutazione formativa, coinvolgimento degli studenti



ENGAGE Students in Formative Peer Assessment to Support Learning

1. Overview of Peer Assessment

Peer assessment, as an alternative assessment form, has been around for centuries (Topping, 2009). Yet it did not garner much attention until recent years, when the landscape of educational assessment underwent substantial changes. With these new changes, assessment for learning, or formative assessment approaches such as peer assessment, which actively engage students in their learning process, have started to permeate the philosophy and practice of teaching.

Peer assessment is usually defined as a process in which students of equal status evaluate each other's work based on agreed-upon marking criteria. With great variations, peer assessment can generally be classified into three main types: formative peer assessment, summative peer assessment, or a combination of both. Formative peer assessment aims to cultivate learning, while summative peer assessment emphasizes accountability and is often used to evaluate student learning and document achievement. In formative peer assessment, students usually play both roles of assessor and assessee. As assessors, students evaluate peers' work and provide critical feedback to help peers improve their products. As assessees, students receive and respond to peer feedback to improve their own work. Being actively engaged in both processes can lead to deep and meaningful learning (Li, Liu, & Steckelberg, 2010; Li, Liu, & Zhou, 2012). This paper will focus on the formative perspective of peer assessment.

As a learning tool and an instructional strategy, peer assessment has been widely integrated across disciplines such as education, medicine, engineering, computer science, business, etc. (Li, 2018) and throughout grade levels from elementary to post-graduate (Scruggs & Mastropieri, 1998). The benefits of peer assessment on student academic outcomes and cognitive development have been extensively reported in literature (Li, 2018). Topping (2017, p. 3) categorizes and highlights benefits as «immediate benefits for learning and achievement», «longer term benefits with respect to transferable skills in communication and collaboration», and possible «ancillary benefits in terms of the self-regulation of the student's own learning». He further asserts that these learning gains occur to both assessors and assessees throughout the peer assessment process.



2. Challenges in Peer Assessment

Despite its noted promises, the peer assessment approach is not without drawbacks. Over the years, there have been a few reported challenges, including peer pressure, time on task, and students' capability to fully understand and execute quality assessment (Li, Steckelberg, & Srinivasan, 2009). A number of studies have reported concerns about the pressure students may experience in peer assessment. When asked to judge the quality of peers' work, students who are novices in assessment may feel uncertain or insecure; therefore, "marking could be easily affected by friendship, cheating, ego or low self-esteem" (Robinson, 1999, p. 96). This issue of peer pressure is especially critical when peer assessment is conducted in an open environment, where assessors' and assessee's identities are revealed. However, with technology assistance, the issue of peer pressure is growing less dire, as anonymity can be easily guaranteed in a technology-enabled setting. Another downside of peer assessment is associated with students' traditional role as learner in education. In traditional, teacher-centered pedagogy, students are seldom asked to assess quality of work. They may not fully understand what rubrics entail and how to evaluate each other's work. Nevertheless, this is not a problem without remedy. Literature suggests that training may help students gain good understanding of marking criteria and acquire critical assessment abilities (Liu & Li, 2014; Song, Gehringer, Morris, & Ringleb, 2016).

The issue of time on task is twofold. From the instructor's perspective, management of paper-based peer assessment may require considerable time (Davies, 2002). Hanrahan and Isaacs (2001) reported more than 40 person-hours for documentation work in an anonymous peer assessment distribution system with 244 students. But this issue can also be easily mitigated in a technological environment. A database-driven peer assessment website can easily manage the collection and distribution process of peer assessment with minimum manual work from instructors. From the students' perspective, however, the issue of time on task is a little more complex. A well-implemented peer assessment is also time demanding and involves quite a few steps, including defining marking criteria, assessment practice, reviewing peers' work, viewing and acting upon peer feedback, etc. The complete process may take a few weeks to complete and requires a long-time commitment. In addition, in paper-based peer assessment, there may be an issue of time delay between provision and retrieval of peer feedback (Li et al., 2009). This challenge may be overcome to some degree by technology, as feedback can be submitted and retrieved in a timely manner in an



online environment; however, holding students' attention and focus through the extended process still seems to be quite problematic.

3. ENGAGE Peer Assessment Model

Taking into consideration the literature reviewed and reflecting upon previous experiences designing peer assessment activities, the researcher has developed a social constructivist peer assessment model—EN-GAGE—which is a coherent and scalable model and may be used to overcome or mitigate the noted challenges in peer assessment.

The design of the model harmonizes with the revised Bloom's Taxonomy (Krathwohl, 2002) and the theory of social constructivism. The revised Bloom's Taxonomy categories cognitive domain in six classifications: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating. The six categories are ordered from the simple to the complex, with the creating level considered the highest level of thinking. Involving students in various components of peer assessment can engage students in the levels of thinking associated with analyzing, evaluating and creating. According to social constructivism, learning occurs as a result of learner's socially and culturally supported interactions (Bauman, 2012). Higher mental functions originate when learners interact with each other or with environments (Vygotsky, 1978). In peer assessment, students interact with peers to advance their knowledge of the targeted content areas.

Figure 1 presents the critical features of this model. In this section, the researcher will briefly describe the main features in each stage of the model.

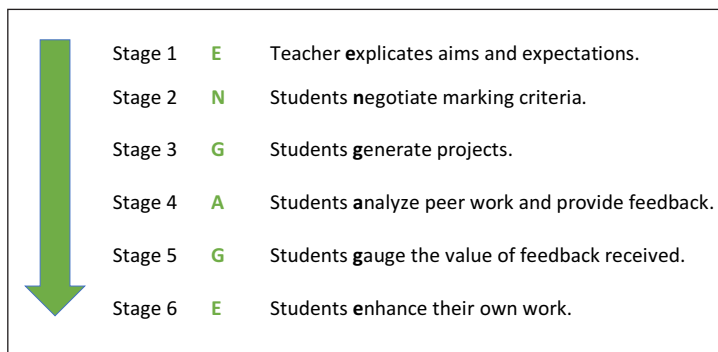


Fig. 1: ENGAGE - Peer Assessment Model

Stage 1: Teacher explicates aims and expectations. In this stage, teachers aim to create a welcoming learning environment that responds to and alleviates students' concerns. Students' role in traditional education is "learner." They are seldom involved in assessment practices. Prior to engaging students in assessing each other, it is critical for students to understand the objectives of such a task (Orsmond, Merry, & Reiling, 1996; Stefani, 1994), as well as their roles and responsibilities in achieving the objectives. In addition, peer assessment is never an easy job for students, as it involves a long process, and completing its many components such as reviewing and providing feedback take considerable time and effort (Li et al., 2009). Only when students understand and embrace the educational significance of peer assessment will they make serious effort when participating in peer assessment. Further, a previous study (Li, 2017) indicated that students who understood and acknowledged the value of peer assessment showed more appreciation and reported less peer pressure during the process than students who did not.

Stage 2: Students negotiate marking criteria with each other and the teacher. After student learn the target content, they co-construct marking criteria with the teacher. A set of clearly defined marking criteria is an essential element in effective peer assessment. With their traditional role in education as the "learner," students need help to gain a better understanding of what a quality performance entails. In addition, some students may lack the ability to correctly interpret marking criteria (Orsmond et al., 1996). In this stage, students may participate in various activities to work with teachers and peers to co-construct performance indicators and weights, and to practice their assessment skills. A commonly used method to improve students' assessment skills is to conduct a calibrated mock assessment, which refers to the comparison between students' ratings and instructor rating of example projects (Song et al., 2016). Through a mock assessment, students become familiar with the marking criteria and what is expected of them before they conduct their first review. Despite its effectiveness, however, calibrated mock assessment mainly uses direct instruction and provides limited opportunity for students to interact. Some students (Li & Liu, 2017) complained that the "drill and practice" type of activity, although useful, was daunting, stressful, and overwhelming. Research suggests that more interactive and student-centered approaches such as game-based learning may be as effective as calibration, and yet may better promote students' intrinsic motivation (Li, 2018).

Stage 3: Students generate projects. Students develop their project as instructed in this stage. Student project can be of various forms such as text, audio, video, image, animation.



Stage 4: Students analyze peer work and provide feedback. To reduce management workload, this stage should be completed in an online system. Some course management systems, such as Blackboard and Canvas, provide built-in features to facilitate peer assessment. In this stage, each student plays the role of assessor to review peers' work and provide critical feedback. During this process, confidentiality should be enforced to control peer pressure. Although students' identities can be easily protected with the assistance of technology, anonymity in peer assessment in a face-to-face classroom setting may not be an easy task to achieve (Li, 2017; Raes, Schellens & Vanderhoven, 2011). For example, a typical peer assessment process may take days and even weeks to complete. Students in face-to-face classes have plenty of time to interact with each other during the period of time. Whether consciously or coincidentally, students may share review information, which would possibly reveal identities of assessors and assessees. Another situation is that, as reported by Liu and Li (2014), curriculum design may require students to interact and collaborate in an open learning environment that does not necessarily support anonymity. In these cases where anonymity cannot be guaranteed or attained due to curriculum requirements or other matters, students should be reminded that the objectives of peer assessment are to foster their learning instead of grading their performance.

Stage 5: Students gauge the value of feedback received. Students play the role of assessee in this stage. It is critical to communicate with students that peer feedback may greatly vary in quality and quantity (Li, 2012). Please advise students that they should not blindly follow feedback received. Instead, they should determine the value of peer feedback prior to any adoptions. In this stage, a platform may be provided to enable dialogues between assessors and assessees to seek or offer clarifications of peer feedback.

Stage 6: Students enhance their own work. Once students determine the quality of peer feedback received, they are in a position to decide how to act upon feedback to improve their own projects. It may help for students to complete a write-up along with their finished product in which they explain how they revised their work in response to peer feedback.

Students' active engagement in Stage 5 and 6 is critical when they participate in the ENGAGE model, as feedback should not be viewed "as an act of information-giving to students, but as a coproductive process in which both students and others have key roles to play" (Boud & Soler, 2016, p. 403). Feedback can be effective only when students reflect upon and learn from it. Students' understanding of and active involvement in

the process is termed as “proactive recipience” by Winstone and colleagues (Winstone, Nash, Parker, & Rowntree, 2017, p. 17).

4. Conclusion

Despite its wide applications in educational settings and well documented promises, peer assessment has long been criticized for a few pitfalls: peer pressure, time on task, and students’ incapability to fully understand and execute quality assessment. The ENGAGE model possesses specific features to overcome or at least mitigate these drawbacks. Previous studies that used this model showed generally positive results. The researcher hopes that the provision of the online ENGAGE model may shed some light on future design and implementation of formative peer assessment.



References

- Bauman E. B. (2012). *Game-based Teaching and Simulation in Nursing & Healthcare*. New York: Springer Publishing Company.
- Boud D., & Soler R. (2016). Sustainable assessment revisited. *Assessment & Evaluation in Higher Education*, 41(3), pp. 400-413.
- Davies P. (2002). Using student reflective self-assessment for awarding degree classifications. *Innovations in Education and Teaching International*, 39(4), pp. 307-319.
- Hanrahan S., & Isaacs G. (2001). Assessing self- and peer-assessment: the students’ views. *Higher Education Research and Development*, 20(1), pp. 53-71.
- Krathwohl D. R. (2002). A revision of Bloom’s taxonomy: An overview. *Theory into practice*, 41(4), pp. 212-218.
- Li L. (2012). How do students of diverse achievement levels benefit from peer assessment?. *International Journal for the Scholarship of Teaching & Learning*, 5(2). Retrieved from: <http://digitalcommons.georgiasouthern.edu/ij-sotl/vol5/iss2/14>.
- Li L. (2017). The role of anonymity in peer assessment. *Assessment & Evaluation in Higher Education*, 42(4), pp. 645-656.
- Li L. (2018). Using game-based training to improve students’ assessment skills and intrinsic motivation in peer assessment. *Innovations in Education and Teaching International*, pp. 1-11.
- Li L., & Liu X. (2017). Teacher Education Students’ Perceptions of a Peer Assessment Model. In P. Resta, & S. Smith (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 1010-1014). Austin: Association for the Advancement of

Computing in Education (AACE). Retrieved from <https://www.learn-techlib.org/primary/p/177887/>.

- Li L., Liu X., & Steckelberg A. L. (2010). Assessor or assessee: How student learning improves by giving and receiving peer feedback. *British Journal of Educational Technology*, 41(3), pp. 525-536.
- Li L., Liu X., & Zhou Y. (2012). Give and take: A re analysis of assessor and assessee's roles in technology facilitated peer assessment. *British Journal of Educational Technology*, 43(3), pp. 376-384.
- Li L., Steckelberg, A. L., & Srinivasan S. (2009). Utilizing peer interactions to promote learning through a web-based peer assessment system. *Canadian Journal of Learning and Technology*, 34(2). Retrieved from <http://www.cjlt.ca/index.php/cjlt/article/view/497/228>
- Liu X., & Li L. (2014). Assessment training effects on student assessment skills and task performance in a technology-facilitated peer assessment. *Assessment & Evaluation in Higher Education*, 39(3), pp. 275-292.
- Orsmond P., Merry S., & Reiling K. (1996). The importance of marking criteria in the use of peer assessment. *Assessment & Evaluation in Higher Education*, 21(3), pp. 239-250.
- Raes A., Schellens T., & Vanderhoven E. (2011). Increasing anonymity in peer assessment using classroom response technology. In H. Spada, G. Stahl, N. Miyake, & N. Law (Eds.), *Proceedings of 9th International Conference on Computer-Supported Collaborative Learning (CSCL-2011)* (Vol. 2, pp. 922-923). Hong Kong: International Society of the Learning Sciences (ISLS).
- Robinson J. (1999). Computer-assisted peer review. In S. Brown, J. Bull, & P. Race (Eds), *Computer-assisted assessment in higher education* (pp. 95-102). London: Kogan Page.
- Scruggs T. E., & Mastropieri M. A. (1998). Tutoring and students with special needs. In K. J. Topping, & S. Ehly (Eds.), *Peer-assisted learning* (pp. 165-182). Mahwah, NJ: Lawrence Erlbaum Associates.
- Song Y., Hu Z., Gehringer, E. F. Morris, J., Kidd J., & Ringleb S. (2016). *Toward better training in peer assessment: does calibration help?*. Retrieved from https://digitalcommons.odu.edu/cgi/viewcontent.cgi?referer=https://scholar.google.com/&httpsredir=1&article=1051&context=teaching-learning_fac_pubs
- Stefani L. A. J. (1994). Peer, self, and tutor assessment: Relative reliabilities. *Studies in Higher Education*, 19(1), pp. 69-75.
- Topping K. J. (2009). Peer assessment. *Theory into practice*, 48(1), pp. 20-27.
- Topping K. J. (2017). Peer Assessment: Learning by Judging and Discussing the Work of Other Learners. *Psychology*, 1, pp. 1-17.
- Vygotsky L. S. (1978). *Mind in Society: the Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.
- Winstone N. E., Nash R. A., Parker M., & Rowntree J. (2017). Supporting learners' agentic engagement with feedback: A systematic review and a taxonomy of recipience processes. *Educational Psychologist*, 52(1), pp. 17-37.

