Technology-enhanced self and peer assessment to support student agency during group projects

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Teamwork and collaborative problem solving competencies are important 21st century skills and considered key graduate attributes for employability and lifelong learning (e.g., Csapó & Funke, 2017). For students to develop collaborative skills and competencies, group work and peer learning are widely-used approaches in higher education. Effective teamwork skills are often implicitly taught and notoriously disliked by students for many reasons including freeriding (social loafing), member dominance or disengagement. Well-functioning teams are underpinned by social-affective dimensions of group work such as respect for reviewers (Carless & Boud, 2018) and social cohesion (Bakhtiar et al., 2018). To positively influence group cohesion and develop team skills, formative peer evaluation of team members' contributions have been shown to effectively support student agency in this process (Stenalt 2021, Sridharan et al., 2018).

This case study explores the affordances of the digital peer review tools Feedback Fruits and Peer Assess Pro to facilitate feedback processes for the successful completion of high-stakes capstone group projects. Bachelor of Science students engage with anonymous team member evaluations of task completion as well as self-evaluation of team skills. To aid a major curriculum transformation at our university towards relational pedagogies, we embarked on an iterative and deliberate approach to scaling peer feedback. The approach aligns with educational design research integrating research and design processes for theoretical and practical outcomes (McKenney & Reeves, 2012, p. 76). Specifically, we aimed to understand 1) the student perception of technology facilitated peer feedback as learning for improved outcomes and raised self-awareness of teamwork skills, and 2) provide a non-threatening environment that enabled personal and collective agency for students as providers and receivers of feedback underpinned by Bandura's (2001) social cognitive theory and human agency. Applying Bandura's notion to group work, student agency can be enacted through a learner's capacity to self-reflect on own capabilities (personal agency) as well as socially coordinated and interdependent efforts towards desired outcomes (collective agency).

Questionnaire data on self-regulation (N=42) confirmed the usefulness of peer evaluation of team members' contributions. However, only half of the students thought that peer feedback positively impacted group coherence and effectiveness such as time management, quality of submissions, or their own performance. Feedback and self-reflections on students' own strengths and weaknesses were found to be empowering and generally supported team effectiveness. This was also evident from students' comments (N=110) within the Feedback Fruits tool where students rated their self- and peer efficacy on six criteria: initiative, engagement, contribution, ideas and communication, focus, and harmony. We identified issues with timeliness and active engagement of the feedback received requiring further iterations of purposefully designed rubrics for intended learning outcomes. The impact of peer feedback on perceived self- and collective efficacy is highly complex and influenced by personal as well as sociocultural values (Bandura, 2001, p. 14). Our emphasis on feedback as a learning-centred process under controlled conditions (technology enhanced with clear rubrics) has shown that students can make the information work for themselves and their teams to improve high-stakes group project outcomes. Importantly, in agreement with Molloy et al. (2019), the development of feedback literacy helps to build academic skills, supports self-regulation and acknowledges feedback as a reciprocal process for future employability.

Keywords: peer review, self-assessment, graduate competencies, capstone learning, groupwork, computer-supported collaborative learning, team skills, employability skills, feedback literacy.

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