

Competence Development and Portfolios: Promoting Reflection through Peer Review.

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Abstract

Portfolios are widely used in higher education to support students' competence development, especially in professional disciplines. A claimed strength is that by actively engaging in portfolio construction, and in reflecting on and assessing their current competences and future development, students will grow as self-regulating professionals. However, researchers argue that students require coaches to support their reflections. Yet coaching is time-consuming, and research shows that it often undermines the very reflective processes that it is meant to help develop. This article investigates peer review as an alternative approach to supporting reflection. Education students identified three competences and justified and evidenced them in a portfolio. They then reviewed the competence claims of peers and received feedback on their own claims from peers. Findings showed that both reviewing and receipt prompted deep reflective thinking as evidenced by changes in the students' portfolios. The discussion focuses on the value of peer review in promoting reflection, on ways of extending this method, and on its relationship to coaching practices.

Keywords: competence, coaching, internal feedback, portfolios, peer review, reflection.

1. Introduction.

Portfolios have a long history of use in higher education to support students' competence development, especially in professional disciplines such as education, medicine, engineering and law (Klenowski, 2002; McMullen et al., 2003; Strudler & Wetzel, 2005). A key merit of structuring competence development around portfolios is that students are active participants in the assessment process. To compile a portfolio, they must reflect on and evaluate their own competence development before submitting it for teacher assessment. Indeed, many researchers and practitioners view portfolios as a tool to promote reflection and, in turn, to develop learner self-regulation (Lam, 2014). However, the success of portfolio implementation, and indeed of competence-based education itself, depends critically on the students' reflective capability (McMullan et al., 2003; Tartwijk & Driessen, 2009). Driessen, Tartwijk, Overeem, Vermunt, & Vlueten (2005) describe reflection, in the portfolio context, as a 'cyclic process of self-regulation' in which students look back at what they have done, analyze what they have and have not yet accomplished, and create plans for future learning. The outputs of such reflections are written justifications of the competences that students think they have developed together with the evidence for them, all appropriately structured in a portfolio. The main problem with portfolios in practice, however, is that their use does not automatically guarantee deep or productive reflection, as research primarily in medical education has shown (Arntfield, Parlett, Meston, Apramian & Lingard, 2016; Aronson, 2011; Driessen et al., 2008).

Driessen et al. (2005) researched the conditions for successful reflection using portfolios and found that the support of a coach or mentor (who generally has a more directive role) was a critical success factor. Coaches were needed to give students feedback on their reflections, to open them up to positions outside their personal perspective, to help them ask the 'right' questions and to help them design their future learning plans. However, this notion of 'coaching reflection' is problematic in practice. First, its implementation requires that coaches invest considerable time and effort, as it is usually proposed as a one-on-one activity (McMullan et al., 2003). This is not a sustainable model given that in all sectors of education student numbers are increasing without a corresponding increase in teachers or coaches. Second, and more important, reflecting is an internal and personal activity, ownership of which resides with students. While it is true that students might need external inputs to help trigger and widen the scope of their reflections (e.g. questions, alternative perspectives), there is an inherent danger

that too much external direction might undermine the very reflective processes that coaches wish to develop (Arntfield et al., 2016; Driessen, 2016; Mitchell, 1994). Third, students themselves need to become more aware of their own developmental relationship with competences, if they are to make informed decisions, unaided, about which to mobilize and when, and if they are to learn to take actions to improve them by themselves. As Knight and Yorke (2003, p. 10) put it, *'the more we are aware of what we know and how we know, the more we are able to use our resources to good effect and go about acquiring new ones'*.

Building on recent research on peer review, this article explores a different position with regards to supporting reflection during portfolio construction. It investigates whether students themselves can, through peer review processes, support each other's reflections about their competence development. In the past, peer review was seen as valuable because students received feedback from a range of other students which added to, and complemented, teacher feedback (Topping 1998; Falchikov, 2005). However, recent research has investigated the learning that results from reviewing, from having students evaluate and provide feedback comments on the work of their peers. This research has shown that producing feedback reviews affords significant learning benefits for the reviewer, and that learning from reviewing usually surpasses the learning gains from receipt of feedback reviews (Cho & Cho, 2011; Cho & MacArthur, 2011; Nicol, Thomson & Breslin, 2014; Huisman, Saab, van den Broek & van Driel, 2018).

An important discovery in recent peer review research is that the benefits of reviewing are born of a 'reflective comparative process' in which students compare the work they are reviewing against their own work, and through this they generate internal feedback on their own work, all without any teacher input (Nicol et al., 2014; McConlogue, 2014; Nicol, 2018). In this sense, reviewing is a genuine reflective activity in that it involves students putting a mirror in front of themselves, whereby they see, compare and evaluate their own work through the lens of the work of others, and whereby they evaluate other's work through the lens of their own (Nicol, 2014). This article investigates whether having students review the competence claims of peers, during portfolio construction, activates similar reflective processes with regards to students' own competence claims. It also investigates the added value of the receipt of feedback reviews on students' reflections about their competences. The following are the specific research questions that framed this investigation:

Q1: How does reviewing the competences of peers, support students' reflection on, evaluation of and narration of their own competence development?

Q2: How does receipt of reviews from peers, support students' reflection on, evaluation of and narration of their own competence development?

This investigation only provides data on the actual changes that students made to their reflective commentaries and to the evidence they included in their portfolios, after reviewing and after receipt of reviews. A subsequent article will report on students' perceptions of the processes of reflection during reviewing and after receipt.

2. Methods.

2.1 Participants.

Nineteen students studying for a Master in Adult Education at the University of Padova participated in this investigation. A requirement in this course is that each student prepares a personal online portfolio, following the European Portfolio Framework. One purpose of this activity is to familiarise students with the European Portfolio, so they can use it in their future professional practice.

2.2 Procedure.

The European Portfolio Framework developed by the Council of Europe¹ requires that students identify and evaluate the competences that they have developed including their scope and context of use, and provide evidence in support of them. They lodge this evidence in the e-portfolio along with a written reflective commentary, which is a justification of their competence claims including proposals for future development. For the Master in Adult Education course, however, students are only required to document five competences rather than all their competences. In this article, we use the term 'competence statement' or 'competence narration' to refer to the reflective commentary and the term 'competence claim' to refer to *all* the information students provide about a specific competence.

¹ <https://pjp-eu.coe.int/en/web/youth-partnership/european-portfolio>. The portfolio version used in this study was the previous one, available at: https://pjp-eu.coe.int/documents/1017981/8494916/Portfolio_en.pdf/b79d4522-1979-493e-b441-16e7153c5428

Table 1 briefly outlines the activities students engaged in as they constructed their portfolio entries. It also shows the timings of the survey questions where students wrote about their experiences of reviewing and receipt of reviews. As noted above the survey data are not reported here.

Table 1: Student activities during the different phases of the peer review process

Phases	Student Activities
Phase I	Individually ranked 6 competence statements produced by students the year before. In small groups discussed the rankings and constructed some evaluation criteria. [From this, the teacher formulated three broad criteria by merging the small group outputs].
Phase II	Constructed three competence statements, using the criteria as guidance, and collated evidence to back up each competence claim.
Phase III	Reviewed (evaluated) 4 competence claims, 3 produced by peers plus one of a high-standard produced by a student in the previous year. Wrote feedback on each, using criteria as guiding framework.
Phase IV	Updated own competence claims and colour-coded changes in blue.
Survey Questions about reviewing	
Phase V	Received feedback from three peers on own competences claims
Phase VI	Updated all competence claims again, and colour-coded changes in green
Phase VII	Added 2 more competence claims with evidence to complete the portfolio
Survey Questions about receiving reviews	

The different phases of student activities depicted in Table 1 were structured drawing on Zimmerman's (2000) cyclical self-regulation model, meaning that in each phase as much responsibility as possible was invested in the students. In Phase I, *preparation*, students individually ranked six teacher-provided competence claims from good to weak and rationalized their rankings. Then, in small groups, they formulated some criteria that could be used to evaluate competence claims. The teacher then collated these group outputs and structured them into three

broad criteria categories to be used by the students and the teacher for the evaluation of competence claims.

In Phase II, *performance*, each student constructed three competence claims, using the criteria as guidance. The next four phases were the focus for the *reflection and improvement*. In Phase III and IV students reviewed the competence claims of four peers and then updated their own competence claims. Reviewing here means evaluating the competence claims of peers and writing feedback comments on them in relation to the criteria. In phases V and VI students received feedback on their own competence claims from three peers and again updated their own competence claims.

A special feature of this intervention was that the fourth competence claim to be reviewed by all students was a high-quality example produced by a student in the course in the year before. This example was enhanced and made anonymous by the teacher. Hence all students had at least one high-standard exemplar against which to compare their own. This meant, however, that they only received feedback from three not four peers. Finally, in Phase VII, which builds on their learning in the earlier phases, students added two more competence claims to their portfolios. The software module 'workshop' in Moodle was used to support all the online activities during phases II-VII.

2.3 Analysis of competence improvements after reviewing and after receipt of reviews.

Nineteen portfolios were constructed with each portfolio showing the changes the student made after reviewing their peers' competence claims, and after receiving reviews on their own competence claims. All students were informed about the nature of the research and gave consent that the information in their portfolios could be used for research purposes.

To assist in the research, students colour-coded the changes they made to their competence statements after reviewing in one colour and after receipt of reviews in another colour. Using Atlas.ti 7 software, the researchers coded the changes in the competence statements against the three broad criteria constructed during Phase 1. Briefly, these were:

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- *Description*: clarity and level of detail in the description of competence from a readers' perspective
- *Depth of analysis*: of claims made, of different contexts where competence was used, differentiation of fact from opinion, of evidenced claim from unsubstantiated claim.
- *Self-evaluative - developmental*: evaluation and critique of strengths and weaknesses in competence development, and identification of need for and ways of further developing competences.

Following Silverman (2001) a mixed approach was taken to the content analysis of the portfolios. This combined a bottom-up data analysis and top-down inferences based on the three criteria. The coding process began with identification of the changes made in the statements and in the evidence in the portfolios, with attention paid to the context of these changes. Coding was then made against the three criteria categories, independently by each researcher so as to establish the boundaries of each criteria category. Once the codes were agreed and verified through a second iteration, one researcher completed all further coding.

Examples of coded changes at the *description level* might include improving the clarity of the description of a competence or its context of application or improving the quality of the writing in general. At the *analysis level*, changes might include greater differentiation of the components of the competence, or more analysis of the rationale for and of the strategies adopted in competence application, or additional contexts of use, or more information about students' affective and motivational experiences during competence development. At the *self-evaluative-developmental level* changes might include deeper evaluation of strengths and weaknesses in that competence and in its development or improvements in the quality and/or scope of plans for future development.

3. Results.

Overall, students made significant changes in their written competence statements as a result of reviewing and as a result of receiving reviews (Table 2). Statistical analysis revealed no difference in terms of the quantity of changes made after reviewing versus after receiving reviews. While changes at all three levels within the reflective commentary were significant (i.e. descriptive, analytical and self-evaluative/developmental) most changes were at the analytical level.

Relative to the competence statements, fewer changes were made to the documentary evidence for a competence which was perhaps predictable. In effect, it is how students interpret and evaluate this evidence that is more important.

Table 2: No. of changes students made to their competence claims in each criteria category after reviewing and after receipt of reviews.

	Reviewing impact		Receiving reviews impact	
	Competences writing	Evidence added	Competences writing	Evidence added
Descriptive level	42		37	
Analytical level	98	17	75	6
Self-evaluative	36		26	

The fact that most improvements occurred at the analytical level indicates that improvements were not just the result of students improving their writing and producing better competence descriptions. Rather, this intervention resulted in students' thinking or reflecting more deeply about where, when, how and why they exercised their competences, and about what they achieved and what they learned from their experiences. Changes made at the self-evaluative level were deeper still and hence there were less of these, as students would have had to deconstruct their experiences further and make judgements about them and determine further avenues for improvement.

Overall, the comparisons generated through reviewing and receiving reviews raised students' awareness of their competences, enabled them to see them from different perspectives, to compare them with others' competences and perspectives and to better justify and articulate them. There is no other way of accounting for the improvements students made to their portfolios. Moreover, the survey data, which will be reported in a subsequent article, and which gives a qualitative account of students' perceptions of their experiences provides additional proof, confirming the causal effects of the different components of peer review on students' reflections. Finally, the teacher of this course, the second author, can attest personally to the fact that students' portfolios in the year of this intervention were significantly better than in any previous year.

4. Discussion.

The consensus in the educational literature is that students need a coach or a mentor to help them reflect and to improve their reflective capability, when constructing a portfolio to evidence their competence development (Driessen et al., 2005; Driessen, 2016; McMullen et al., 2003). There are however conceptual and practical arguments against coaching as the main or only pathway of support, and the idea of coaching reflection is considered problematic by some researchers and by some students, especially those opposed to 'mandatory' reflection (Arntfield et al., 2016; Snadden, Thomas, Griffen & Hudson, 1996; Mitchell, 1994). The research reported in this article demonstrates an alternative approach to supporting reflection when making competence claims and constructing a portfolio. It shows that students can support each other's reflections through peer review activities.

4.1. Peer review and reflection.

In the peer review intervention that forms the basis of this article, students compared their competence claims against those of three peers, against a high-quality competence claim constructed by the teacher and against comments received from three peers. This rich source of external inputs provided students with a kaleidoscope of different perspectives and reference information with which to stimulate their reflections, and out of which they made significant improvements in their competence claims. What is remarkable about these reflections is that they all occurred without any direct input from a teacher or coach.

This research therefore provides strong evidence that reviewing and receiving reviews are at least complementary to, and might even afford advantages over, the learning benefits a coach might provide. First, peer review puts responsibility for reflection into students' hands which is where it is ultimately located. By exercising reflection in this way, students are more likely to develop the independence of thought and self-regulation that coaches wish them to develop. Secondly, through reviewing students make actual comparisons of their own competence claims with those of others who have different competences (and hence have made different competence claims), so this provides a potentially richer lens of inputs for reflection than a single coach could provide. It also means that students' reflections might embrace wider aspects of their competence experiences (e.g. affective, motivational), beyond those required merely to satisfy the grading demands of the portfolio task. Thirdly, students still receive feedback from

others on their competence claims (i.e. from peers) but they do so only after they have self-generated reflections and feedback themselves from their earlier comparisons (during reviewing). Receipt at this point might reinforce prior reflections, or add to them, or even conflict with them, all of which should trigger further productive reflections.

Finally, a specific advantage of reviewing is that the internal reflections generated by students themselves, through the lens of their own competence claims, are more likely to tap into their own perceived developmental needs, rather than their needs as interpreted by others. However, one potential drawback of reviewing is that students might not encounter a high-quality reflective commentary against which to make a comparison, and against which to calibrate their own reflective commentary. This was addressed in this implementation by inserting a high-quality exemplar into the set of competences that students reviewed.

In sum, while reviewing and receipt of feedback reviews might confer different learning benefits and trigger different reflective processes the merit of peer review is that both reviewing and receipt occur together, one after the other. In addition, the fact that reviewing precedes receipt is an important feature of this method as it means that the initial reflections by students occur without any direction from others. As well as helping address the coaching issue, the research presented here also adds to the literature on peer review. Prior research on peer review has focused on the learning benefits that occur when students are producing academic work (e.g. a design, an essay, a report). This investigation shows the potential power of peer review in another domain, that of competence development and portfolio construction.

4.2 Limitations of this investigation.

Despite its promising implications for future research on reflection and reflective practice during portfolio construction, there were a number of limitations in this investigation. First, the sample size was small, and the subjects were postgraduate education students, so there is a need to investigate these methods with a larger sample, with undergraduate students and with those from disciplines and professions other than education. However, there are a growing number of studies of peer review showing that the core ideas are applicable across disciplinary domains (e.g. Huisman et al., 2018). A more specific limitation with regard to portfolio construction is that in this implementation students compiled a portfolio based on their prior learning and competence development. There is therefore a need to investigate reviewing and receiving reviews

in more dynamic scenarios where students are constructing a portfolio over time, for example, as they are acquiring competences over the timeline of a whole degree. Medicine would be a good focus here, as this is an area where portfolios are widely used, and where there is considerable discussion about reflection and coaching (Hodges, 2015; Driessen, 2016; Arntfield et al., 2016).

5. Conclusion.

In terms of future improvements, it should be recognized that the peer review methodology reported here was based on the exchange of documents, and while there was dialogue amongst students in tutorials it was not a specific feature of the peer review process. Significant enhancements to the peer review implementation could therefore be made by, for example, having students review the competences of peers in pairs or in groups rather than individually or by harnessing peer dialogue at other stages of the peer review process. Indeed, from the perspective of the reflective approach proposed here, working in pairs and in groups would provide further opportunities for reflective comparisons, with students comparing their thinking about their own competences and their development with those of other group members during their portfolio constructions. Indeed, Nicol (2013; 2014) proposes dialogue as one of his principles for effective peer review design and those researching peer review are now increasingly turning their attention to such group processes (Strijbos & Wichmann, 2018).

Another consideration, not discussed so far, is how to integrate the benefits of coaching with those of peer review. This article is not an argument against coaching or mentoring, rather its intention is to suggest another method that might help achieve the main goal of portfolios, which is that students have maximum opportunities to develop their own reflective capability, their independence and capacity for self-regulation. Hence, if coaching were to be added to peer review, ideally it should follow rather than precede peer review processes. After students have generated a wide range of reflections by themselves, they are much more likely to be receptive to any valuable suggestions a coach might provide but without being overwhelmed or dominated by that coach.

6. References

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