

Sep 28th, 9:00 AM

Evaluating Architecture students' perspective of learning in peer reviews

Charlie Smith
Liverpool John Moores University

Follow this and additional works at: <https://dl.designresearchsociety.org/learnxdesign>



Part of the [Art and Design Commons](#)

Citation

Smith, C.(2013) Evaluating Architecture students' perspective of learning in peer reviews, in Reitan, J.B., Lloyd, P., Bohemia, E., Nielsen, L.M., Digranes, I., & Lutnæs, E. (eds.), *DRS // Cumulus: Design Learning for Tomorrow*, 14-17 May, Oslo, Norway. <https://doi.org/10.21606/learnxdesign.2013.138>

This Research Paper is brought to you for free and open access by the Conference Proceedings at DRS Digital Library. It has been accepted for inclusion in Learn X Design Conferences by an authorized administrator of DRS Digital Library. For more information, please contact dl@designresearchsociety.org.

Evaluating Architecture students' perspective of learning in peer reviews.

Charlie SMITH*

Liverpool John Moores University

Abstract: Existing research suggests that peer review is a highly effective method for delivering formative feedback, and that it embodies numerous qualities that align closely with creative programmes. However, little research has evaluated creative students' qualitative opinion of the process. This paper summarises a case study that identified Architecture students' perceptions of peer reviews, addressing: how they compared to traditional feedback methods, the value of peer feedback, and how peer review contributed to their learning both in relation to the work being evaluated and beyond. Peer reviews were held with a group of final year undergraduates to provide feedback on their concurrent design project, and the students' views of the experience identified through a questionnaire. A key objective was to draw conclusions on the nature of learning associated with peer review, and its appropriateness as a forum for formative feedback. The study found that students valued the feedback from their peers, and that the process contributed to their own critical thinking in subsequent work. They were generally highly supportive of peer review, but not as a substitute for traditional feedback methods. Some notable contradictions with existing research on peer review were observed.

Keywords: Peer review, formative feedback, design review, student perceptions.

* Corresponding author: School of Art and Design | Liverpool John Moores University | United Kingdom | e-mail: c.r.smith@ljmu.ac.uk

Introduction

Existing research suggests that peer review – students providing feedback to those in the same year, as defined by Topping (1998, 250) – has numerous attributes as a learning method, many of which align closely with learning objectives in creative programmes. These include: developing analytical and evaluation skills, fostering independent thinking, heightening engagement, increasing the quantity and range of feedback students receive, developing an understanding of what constitutes good work (and why), developing team-working and collaborative skills, increasing confidence and empathy, and encouraging deeper learning (Pearce *et al.* 2009, 4; Vickerman 2009, 222; Liu and Carless 2006, 288; Boud *et al.* 2001, 8; Falchikov 2001, 70; Orsmond *et al.* 2000, 35; Topping 1996, 324). Ramsden (2003, 199) suggests that structured use of peer review encourages a more responsible and self-critical view of student's achievements, and Stuart-Murray (2010, 16) identifies student-led reviews as showing higher levels of both participation and understanding, as the process is cognitively demanding rather than passive (Nicol 2011a, 2). A study cited by Berry and Sharp (1999, 29) found that co-operative learning tends to promote higher achievement than individualistic methods. However peer review is not without potential issues; for example, students may not believe they can learn anything worthwhile from their colleagues (Boud *et al.* 2001, 11). Studies have found that students can find it difficult to be critical of their peers (Lindholm *et al.* 2006, 59; Falchikov 1995, 184), which would create a significant problem in creative disciplines such as Architecture, where critical evaluation of project work is a fundamental objective of formative feedback.

The annual UK National Student Survey (NSS) repeatedly shows that students are least satisfied with assessment and feedback, and that dissatisfaction is higher than average amongst creative programmes - especially Architecture (Vaughan and Yorke 2009, 8). In design modules of Architecture programmes formative feedback is unwaveringly delivered using the design review (Stuart-Murray 2010; Parnell *et al.* 2007; Ilozor 2006; Koch *et al.* 2002; Nicol and Pilling 2000; Anthony 1991). In its traditional format a cohort is divided into groups of 15 to 20 students, who each stand in front of their drawings and models before a small panel of tutors and deliver a brief verbal overview of the work and the ideas that underpin it. The tutors – varying in number from two to six or more and seated immediately in front of the student – then ask questions and provide feedback verbally on strengths, weaknesses and areas for development. Students are critiqued in turn, and those not being reviewed observe in an informal semi-circle behind the tutors.

Boud (1995, 40) argues that Higher Education must equip students to self-assess in their professional lives through developing self-assessment activities. Indeed, developing students' critical evaluation skills is a quintessential objective in architectural education – albeit often an implicit one (Nicol 2011a, 3) – in order that they can learn to critique their own work and give feedback on that of others. Although tutors might believe that the traditional design review develops such skills, in reality it is notably ineffective in doing so. As Sadler (2010, 544) highlights, students need experience of being involved in making judgements about quality themselves. The degree of involvement of the student audience in traditional design reviews varies, but typically they will passively observe from behind the tutors. This is due in part to the physical layout of the review, as tutors sitting in front of the work create an effective barrier to observing peers, which makes it difficult for them to see the work being discussed let alone engage in the critique. Also, students are reticent about

contributing due to the student-tutor power dynamic (Webster 2006, 289), not wishing to openly criticise a peer in the presence of tutors (Wilkin 2000, 105) or to make inarticulate comments.

There is some research exploring peer review in architecture (Parnell 2003; White 2000), however little (CUDE undated) focuses on students' qualitative evaluation of them. This case study sought to identify students' opinions of peer review, in particular on: how they compared to traditional design reviews, how they valued feedback from their peers (compared to their tutors), and – importantly – did they consider that the process contributed to their subsequent critical appraisal of their own work? The latter is particularly significant in terms of identifying the development of critical analysis skills – a key attribute cited of peer review (Sadler 2010, 542; Boud 1997, 200).

The study focussed exclusively on formative feedback, as a primary objective was to evaluate peer review as an alternative to the traditional design review as a forum for developmental feedback. Both Liu and Carless (2006, 282) and Nicol (2011a, 4) highlight that most published studies of peer review focus on grading rather than formative feedback, and reassert Topping's proposal (1998, 258) that research is needed on peer review as a process where students develop critical judgement by reviewing the work of others.

Methodology

The study involved students from a cohort of NQF Level 6 (final year) undergraduate Architecture students studying for a three-year degree within a United Kingdom university, all of whom working on their final project – a 20-week design module. Every student in the cohort of 68 was invited to participate by email, giving an overview of the project, what involvement would entail and the project timescale. The Participant Information Sheet was attached, confirming: the purpose of the study, that participation was voluntary and that participants could leave at any time, what participants would do, any risks and benefits of being involved, that participation and contributions would be confidential, and what would happen to the results of the study.

Given an obvious comparability between peer reviews and focus groups – an open exchange of ideas about a given subject – a group size of eight students was based on an ideal for a focus group (Litosseliti 2003, 3). Had the number of respondents exceed this then participants were to be selected on the basis of those who responded first; however, in the event the number of respondents matched the intended group size. Whilst this method of participant selection was not without short-comings, others were considered more problematic. As the peer reviews would take place in self-directed study time – independent of tutorials, traditional reviews and lectures – it was important that participation was voluntary.

The project was approved by the host university's Research Ethics Committee. Informed consent was gained by each participant completing a consent form before the first peer review session, at which they were re-issued with the Participant Information Sheet. The students were assured they were within a confidential, non-judgemental environment; research seeking students' opinions is more robust when participants feel that they can freely express themselves (Merton *et al.* 1990). Although this would be their first experience of peer review, encouragingly the volunteers included a balanced mix of abilities, and therefore it was not a format that only appealed to stronger students – a possibility given that they were providing feedback to each other in an

open forum. The gender ratio of the group was 12% female and 88% male; this is discussed in the context of the cohort's gender ratio later.

The peer reviews were held in a similar format to traditional design reviews as an objective of the study was to evaluate how students compared them; also, providing feedback to their peers would be a novel experience without further complication of a new format. This arrangement also aligned with the relevant features of van der Berg *et al.*'s optimal model for peer review (2006, 34). Additionally, Sadler proposes that peer review should provide participants with an experience as similar as possible to their tutors' in order to facilitate students' understanding of tutors' feedback (2010, 541). Combining this format with students' reviewing their on-going project work also ensured strong alignment with concurrent learning objectives (Gielen *et al.* 2011, 144).

Two peer review sessions were held. The participants pinned up their current drawings and models in the design studio, and were briefed on the objectives of the case study and the nature of feedback to be provided. Each in turn described their work to the peer group – sitting in a loose semi-circle around them – who gave the presenting student mutual feedback (Gielen *et al.* 2011, 146). Throughout the process the tutor sat at the back and refrained from commenting. Parnell (2003, 2) suggested that students could critique work first followed by the tutor, but White (2000, 218) considered that this might suffer from the traditional student-tutor dynamic, either reducing the perceived value of peers' comments or ignoring them in favour of the tutor feedback to come; therefore the tutor maintained a role purely of facilitator. The first peer review session took place mid-way through the module (week 11) with the second two weeks later, so participants had opportunity to reflect on the process and to incorporate feedback into their work. Each session lasted between two and three-and-a-half hours.

As the first session progressed there was very little need for tutor intervention - only to move the group on to the next review. Participants were strikingly forthcoming with feedback; the level of engagement from each student was very high, with no evident reticence in contributing. Whilst there were clearly leaders within the group who would be first to feedback, or contribute more to the commentary, no-one dominated the sessions. The quality of feedback was also notable. Previous research suggests comments might deal with peripheral issues so as not to openly question fundamental elements of each other's work, but there was no evidence of this. Feedback was generally high quality, relating to issues central to the development of the work. The level of engagement and quality of feedback suggests an answer Pearce *et al.*'s question of whether students take peer review seriously if it does not count for marks (2009, 5) – in this study, without a doubt.

Analysis and Findings

Student evaluation of the peer reviews was established through a questionnaire, issued to participants following the second session. This consisted of 11 open questions which started generally, asking how they compared them with traditional reviews, and moved on to more specific issues such as the value of feedback, and the potential role of peer review. The response rate was one hundred percent. The responses were studied anonymously through relational content analysis (Marshall 2011, 161), from which a report summarised key concepts and responses associated with them. The following synopsis identifies the group's general consensus on these key concepts, and uses representative responses to illustrate significant points.

What were the differences between peer and traditional reviews?

The traditional design review is used almost exclusively to deliver formative feedback throughout the undergraduate course – between five and ten times each year. The participants were unanimous in perceiving that the peer reviews had positive qualities not found in traditional reviews, but the nature of those qualities varied. Although in traditional reviews an audience of peers is always present, three participants highlighted that they received feedback from their peers in a way that doesn't occur in traditional reviews, with one confirming the view that students are reticent to participate in traditional design reviews. The peer reviews generated a very different environment; indeed, several participants highlighted that this enabled them to articulate themselves better. This suggests that the peer reviews facilitated clearer thinking – and therefore potentially learning – than traditional reviews, as this response illustrates:

There was a calmer, friendlier, relaxed atmosphere with the peer reviews which then allowed you to express every step of the project painting a clearer picture in the reviewers' mind of the scheme. This atmosphere allowed me to think quicker and remember some points than in a traditional review.

Whilst responses implied that aspects of peer review are unique, equally there were qualities that participants didn't get from the peer reviews that they do from traditional ones. One negative perception associated with the peer reviews arose as a consequence of the open debate that they instigated. Whilst this was generally seen as positive in the sense that many ideas were generated which inspired students, one participant highlighted a lack of direction at the end of the sessions. Two participants considered the peer review sessions to be less onerous than traditional reviews, and consequently produced less work in preparation for them. Also of concern is the perception given in four responses (half of the group) that their peers' feedback had less significance than that of their tutors, as the following response exemplifies:

I think some students treated the peer reviews with less gravity and didn't see the ideas discussed as significant as those of a traditional review.

The participants' overall consensus was that peers have more empathy than tutors, and that the more informal atmosphere of the peer reviews generated greater interaction, enabled students to express themselves better and articulate their thinking more clearly. The informality compared with traditional reviews encouraged debate and more opinions to be expressed; there is evident benefit in challenging the tutor-student power dynamic that clearly impacts upon learning in traditional design reviews (Sara and Parnell 2004, 2). However, concern was raised by half of the participants over the depth of feedback received; this is discussed in more depth later.

Did participants feel more engaged in peer reviews than traditional ones?

One of the qualities existing research highlights of peer review is encouraging higher levels of engagement. This was reinforced by all of the participants. Peer reviews were unanimously considered more engaging, with two participants highlighting that in traditional reviews it is easy to become removed from the process, supporting Vu and Dall'Alba's (2007, 542) statement that peer assessment promotes discursive interaction

in relation to a task. Four participants commented specifically that both the process itself – being expected to deliver feedback to each other – and the intimacy of a small group contributed to this. One of Thomas's findings (2012, 72) was that promoting supportive peer relationships in HE, such as active participation and interaction, is a key characteristic of fostering belonging, contributing in turn to retention and student success. However, although participants were more engaged in the sessions on the day, it is worth re-iterating that some prepared less for them and were less engaged in that respect.

Did participants consider that feedback from peers contributed to their design project?

Participants were asked if the feedback received from their peers contributed to their learning about their project, to identify if feedback was valued in terms of the development of their work. All of the participants responded positively. More than half of the group commented specifically on the process as being very dynamic and fostering creative thinking; it was considered more multi-directional than traditional reviews, where dialogue is predominantly between the tutors and the student being reviewed:

During the reviews a lot of the students were bouncing ideas off each other at quite a fast rate. I feel that by doing this it encouraged us to use our creative thinking at a quicker rate.

It is noteworthy that participants both respected and valued feedback from their peers, who would have no involvement in the final assessment of their work. They were unanimous in commenting that feedback from peers had a positive contribution to their project, which contradicts previous research (Nicol 2011b, 6) that found a large number of students claim that peer reviews they receive are not helpful.

Did reviewing work of others help thinking beyond the sessions themselves?

The next questions delved deeper, seeking to identify if critiquing the work of others had developed skills used outside of the sessions. This would establish if the peer reviews had value beyond learning derived from the feedback itself, and if learning developed through the process of questioning – a powerful quality if present. The participants substantiated this. Indeed, it is striking to note that every response was positive; clearly participants found they took a significant level of learning from the peer reviews. Particularly interesting is that learning varied from student to student, including: decision making and thoughtfulness, creative thinking and inspiration, and awareness of specific issues. Analysing and providing developmental feedback on each other's work evidently facilitated thinking about similar issues in participants' own work. Learning from the work of others, and understanding the standard of their work and where they are up to, was a clear feature of the sessions.

Of all the positive qualities that the literature review highlights of peer review, arguably the one most closely aligned to architecture and other creative programmes is its contribution to developing critical analysis skills. Therefore a key ambition of the study was to identify the nature and extent of learning participants identified in this respect. All of the participants identified learning beyond the peer reviews, with three-quarters making direct reference to applying the critique process to their own work as a direct result of the sessions, which validates an increase in self-critical analysis – one

of the key objectives of the process. This supports Topping's (1996, 325) suggestion that peer review contributes to students' self-assessment, as the following response exemplifies:

After the peer reviews when working on my design I thought about each aspect of the design with a critical mind asking "do I need this here?" and "what does this contribute to my project, is it positive or negative?"

Some participants also identified wider learning from the sessions, including debating skills and presentation techniques. Amusingly, one commented on problems deciphering other students' plans, giving them insight into what tutors express on numerous occasions during reviews and tutorials! Having to critique each other revealed the need for clarity in presenting work so that reviewers are able to read and understand it. It is widely recognised that that one of the most effective routes to learning something is to act as the teacher (McKeachie *et al.* 1986, 63; Topping 1996, 324), and research on peer teaching finds that both parties benefit in peer teaching, but the tutor more so than the tutee (Biggs 2003, 112); this study suggests that the same is true of peer review.

How confident did participants feel giving feedback to their peers?

In a design review work is presented and feedback given in front of colleagues and tutors. Therefore the participants' experience of providing feedback to their peers was explored, firstly in terms of how confident they felt delivering it. With just one exception, the participants felt confident delivering feedback to their peers. This is very positive, particularly bearing in mind that it was done verbally – directly to the student in an open forum – and not anonymously through a written feedback sheet. It is noteworthy that the one participant did not feel confident only because they did not know some of the peer group and therefore did not know how they would react to feedback. This was reinforced by others, who highlighted that they felt confident for two reasons: firstly as final year students they feel more experienced and that they have greater understanding, and secondly that familiarity between the peers enabled them to give stronger feedback.

Did participants find it awkward to give critical feedback to each other?

Delivering feedback directly has many advantages, such as facilitating a dialogue between tutor and tutee (Smith 2011, 59), but could create tension between peers in a manner that does not exist in traditional reviews due to authority in the tutor-student power dynamic. Therefore, as well as having the confidence to deliver feedback, a related issue was whether participants found it difficult to make critical comments to their peers:

At first it seemed almost hard to criticise someone's work, knowing how much effort they put in. However after the first two or three presentations, there becomes a more relaxed atmosphere and it becomes easier to give feedback because you know that they appreciate the help.

Two participants stated they were initially cautious of giving critical feedback, but for both this diminished as the first session progressed; the rest were unanimous that making critical comments of colleagues' work was not awkward. These responses

suggest that in the environment of peer reviews students did not feel that their peers would be adversely affected by critical feedback, contradicting Lindholm *et al's* (2006, 59) study where students found it difficult to be critical towards a peer. Two participants specifically highlighted as feeling that they could give more critical feedback to peers with whom they were familiar, which contrasts with Falchikov's research on peer assessment (2001, 2). Nicol (2011b, 6) found that students value anonymity in peer feedback, however in this study familiarity was more important when giving more critical – and arguably more insightful – commentary. The informality of the sessions and familiarity between the peers was fundamental in facilitating critical feedback. Participants recognised the mutual critique between each other, felt open-minded to new ideas, and in a position of wanting to assist each other's work.

How did participants perceive peer reviews in terms of feedback received?

A key issue was to establish the participants' opinions about the quality of feedback that they received from their peers, particularly in comparison to that delivered in traditional reviews. Although one of the objectives of peer reviews is to develop critical analysis skills, if students do not value the feedback they receive this undermines the process as a whole; if feedback is valued in addition to developing such skills, then it is a win-win. Encouragingly, the feedback participants received was generally perceived positively by the significant majority of the group, as the following response demonstrates:

I feel it was really helpful in discussing ideas about how the project could move forward. Unlike a traditional review, we had more time to relax and discuss the ideas in more details, which we don't always get the chance to do in traditional reviews.

However, two participants suggested that although the feedback was varied and diverse – which was perceived positively – it also meant that within the limited time frame of a review the feedback might not be as specific, or therefore in-depth. Also, one participant suggested that with peer review being a new experience they sometimes found it difficult to express points clearly and concisely, whereas in a traditional review the tutor critic would have much more experience in articulating feedback.

There were evident differences perceived in the nature and quality of feedback between peer and traditional reviews. None of the respondents directly questioned the validity of feedback from their peers, some even describing it as more palatable and less confusing! Furthermore, feedback covered areas not normally considered in traditional reviews, such as presentation techniques. The peer review environment fostered rapid sharing of diverse ideas, and therefore the feedback had a broader scope. However, half of the participants considered that the process lacked tutors' foundation of experience – such as an appreciation of wider architectural issues – and as such the feedback lacked depth, reinforcing the findings in White's study (2000, 215). Also, the feedback highlighted and discussed issues but did not necessarily suggest solutions in the way that a traditional review might.

What is the role of peer review?

The questionnaire concluded by asking how participants perceived the role of peer reviews in design modules. They were unanimous that peer review is a valuable complimentary session to – but not a replacement for – traditional reviews. The participants found peer reviews to be interesting, engaging and inspiring; they were unanimous in supporting them as a method for generating formative feedback on their work. One student commented that they didn't think colleagues in the year give each other enough feedback, and that the peer reviews were a good platform to voice opinions on each other's work. Participants also felt motivated following the sessions. Whilst both traditional and peer review are a form of oral evaluation, the latter is weighted much further towards 'dialogue' as opposed to 'presentation' in Joughin's range of interaction (2003, 148). Therefore it could be argued that peer review is more appropriate in generating formative feedback, particularly in the early stages of a design project where students are exploring ideas rather than refining them.

If staff-to-student ratios continue to rise then peer review might present an appealing strategy for providing formative feedback (Boud 1995, 36). However at a time of increasing fees is it acceptable for students to be adopting the role of critic, in place of tutors? Biggs (2003, 191) notes that some students resent reviewing other students' work, believing that is the tutors' responsibility. In this study the participants all supported peer reviews, but not as a replacement for traditional ones. For example, alternating peer reviews with traditional was suggested. One participant perceived the peer reviews more as an advanced tutorial than a formal review, which suggests a potential role for peer reviews between the tutorial and traditional review.

It is worthwhile noting that notwithstanding the unanimous positive responses of this study – a series of incidental events that took place outside the concurrent module – peer review is most successful as an integral element of the overall course (Sampson and Cohen 2001, 21). However, Vickerman (2009, 226) cautions that while useful for some, peer review is not a strategy for all students, and problems of acceptance are elaborated on further by Cohen and Sampson (2001, 61). Whilst participants were unanimously supportive it must be noted that they were all volunteers, and therefore others may be less so.

Conclusions

Some critical remarks can be made regarding this study. Firstly the sample size was small and there was a significant gender imbalance within the group; therefore conclusions drawn from the study must be treated with a degree of caution. Also, the facilitator for the project was one of the cohort's tutors, which may have impacted upon questionnaire responses. However, the very high incidence of unanimous responses is indicative of some robustness. It could be argued that volunteers are more likely to respond positively than if it were a requirement of all, but Boud suggests that those reluctant to participate might be more keen through experience in the process (2000, 157).

To answer Vickerman's (2009, 223) question of whether students find their peers' feedback valuable, the participants in this study were unanimously positive. Involvement clearly benefitted subsequent self-critical analysis, where heightened awareness caused participants to question their subsequent work as they designed it. They identified other learning in addition to the feedback received on their project, and beyond the peer review sessions themselves, such as: decision making, communication

skills, and inspiration. Being asked to critique work also effectively demonstrated the need for clear representation so that critics can understand a project through drawings and models. Participants did find it challenging to articulate their feedback clearly, however this was an unfamiliar experience.

Pond *et al* (1995, 317) highlight issues of low student motivation in peer review that had no bearing on assessment. In sharp contrast, although the reviews in this study had no summative dimension the participants were unanimously more engaged than in traditional reviews. However, this should be cautioned with the participants' perception that peer reviews were less onerous than traditional reviews, and therefore some approached the sessions with less preparation.

Contrary to existing research the majority of participants did not find giving their peers critical feedback awkward; this is particularly worthy of note given that participants were delivering verbal feedback, face-to-face. That participants felt able to be more critical with peers they were familiar with has implications for structuring peer groups. The peer reviews created a different environment to traditional reviews, in which participants could think more clearly and articulate themselves better; this generated very open dialogue with a wide range of opinions being expressed – something not experienced in traditional reviews.

Liu and Carless (2006, 285) comment that whilst research indicates students are able to make reliable summative judgements compared to tutors, the issue of students' expertise when delivering feedback remains unclear. In this study participants were generally supportive of the quality of feedback received from their peers, highlighting that valid and useful issues were raised that were often more palatable and less confusing. However, half the participants identified that the greater depth of tutors' knowledge gives deeper insight than a more basic comment from a peer, and that there were probably issues that were not raised in the peer reviews that would have been during a tutor-led one. Also, the open debate that was seen by some as a positive quality also meant that there was less direction given by the end of the review, and therefore less understanding of what participants' next step should be. Whilst Pearce *et al* (2009, 13) suggest that this helps students learn to distinguish between helpful and unhelpful feedback, it was clearly a matter of concern. Evidently peer review is not seen as substitutional (Topping 1998, 256) to tutor-led formative reviews.

Whilst nothing can be robustly concluded, the discrepancy in gender ratios between volunteers for the study and the full cohort is worthy of comment. The ratio of volunteers was 12% female and 88% male – very different from 36% female and 64% male of the cohort. It was not clear why this occurred. If it was due to female students' unease at the prospect of reviewing or being reviewed by their peers, then it could have serious implications on the appropriateness of applying peer review to a whole cohort. Research on gender in peer review is inconclusive. Topping (1996, 328) reports a study that compared Grade Point Averages for peer tutored and non-tutored students, which found that male peer tutored students achieved higher GPAs than non-tutored, but that female did not. However this contradicts the view of Boud *et al* (1999, 415) that collective peer learning may better suit female students, and Sara's (2001, 11) argument for feminising the architecture curriculum through increasing collaborative learning such as peer assessment.

Participants were unanimous both in their support of peer review as a part of the learning process, and in seeing them as supplementary to traditional reviews. In their collective responses there is strong validation of Sadler's view of peer review as a valuable pedagogical strategy (2010, 548). Peer review clearly has an important

potential role to play in architectural education, and indeed other creative subjects, particularly in the early stages of a project where ideas are being generated and explored. However the contradictions with existing research and the unresolved question of how gender impacts on peer review mean there is significant need for further research. The author's ambition is to integrate peer reviews as a formative assessment method within design modules. It will be particularly informative to introduce peer review across the full cohort, or across all undergraduate levels, thereby increasing students' familiarity with the process, and undertake a similar study of establishing the students' perceptions.

References

- Anthony, Kathryn H. 1991. *Design juries on trial: the renaissance of the design studio*. New York: Van Nostrand Reinhold.
- Ilozor, Benedict D. 2006. "Balancing jury critique in design reviews." *CEBE Transactions*, 3(2): 52-79.
- Berry, John, and Jenny Sharp. 1999. "Developing student-centred learning in mathematics through co-operation, reflection and discussion." *Teaching in Higher Education*, 4(1): 27-40.
- Biggs, John. 2003. *Teaching for quality learning at university*. 2nd ed. Buckingham: The Society for Research into Higher Education and Open University Press.
- Boud, David, Ruth Cohen and Jane Sampson. (Eds). 2001. *Peer learning in higher education*. London: Kogan Page.
- Boud, David. 2000. "Sustainable assessment: rethinking assessment for the learning society." *Studies in Continuing Education*, 22(2): 151-167.
- Boud, David, Ruth Cohen and Jane Sampson. 1999. "Peer learning and assessment." *Assessment and Evaluation in Higher Education*, 24(4): 413-426.
- Boud, David. 1997. *Enhancing learning through self assessment*. London: Kogan Page.
- Boud, David. 1995. "Assessment and learning: contradictory or complimentary?" In *Assessment for learning in higher education*, edited by Peter Knight, 35-48. London: Kogan Page.
- Cohen, Ruth, and Jane Sampson. 2001. "Implementing and managing peer learning." In *Peer learning in higher education*, edited by David Boud, Ruth Cohen and Jane Sampson, 50-66. London: Kogan Page.
- CUDE. (undated). "Enriching the review: constructive criticism and peer review." www.heacademy.ac.uk/cebe/themes/alldisplay?type=resources&newid=themesandprojects/Teaching_Packs_from_the_CUDE_Project&site=cebe (accessed 17 September 2012).
- Falchikov, Nancy. 2001. *Learning together: peer tutoring in higher education*. London: Routledge Falmer.
- Falchikov, Nancy. 1995. "Peer feedback marking: developing peer assessment." *Innovations in Education and Training International*, 32(2): 175-187.
- Gielen, Sarah, Filip Dochy and Patrick Onghena. 2011. "An inventory of peer assessment diversity." *Assessment and Evaluation in Higher Education*, 36(2): 137-155.
- Joughin, Gordon. 2003. "Dimensions of oral assessment and student approaches to learning." In *Assessment matters in higher education: choosing and using diverse approaches*, edited by Sally Brown and Angela Glasner, 146-156. Buckingham: SRHE & Open University Press.

- Koch, Aaron, Katherine Schwennsen, Thomas A. Dutton and Deanna Smith. 2002. *The redesign of studio culture: a report of the AIAS studio culture task force*. Columbia: The American Institute of Architecture Students.
- Lindholm, Sari, Heikki Pihlajamaki and Toomas Kotkas. 2006. "Self, peer and teacher assessment of student essays." *Active Learning in Higher Education*, 7(1): 51-62.
- Litosseliti, Lia. (2003). *Using focus groups in research*. London: Continuum.
- Liu, Ngar-Fun, and David Carless. 2006. "Peer feedback: the learning element of peer assessment." *Teaching in Higher Education*, 11(3): 279-290.
- Marshall, Catherine, and Gretchen B. Rossman. 2011. *Designing qualitative research*. 5th ed. London: SAGE Publications Ltd.
- McKeachie, Wilbert J., Paul R. Pintrich, Yi-Guang Lin and David A. F. Smith. 1986. *Teaching and learning in the college classroom*. University of Michigan: Office of Educational Research and Improvement.
- Merton, Robert K., Marjorie Fiske and Patricia L. Kendall. 1990. *The focused interview*. 2nd ed. Illinois: The Free Press.
- Nicol, David. 2011a. "Developing the students' ability to construct feedback." Paper presented at QAA Enhancement Themes conference, Heriot-Watt University, March 2-3.
www.enhancementthemes.ac.uk/pages/docdetail/docs/publications/developing-students-ability-to-construct-feedback (accessed 3 September 2012).
- Nicol, David. 2011b. "Peer evaluation in education review." *JISC Final Report*.
www.reap.ac.uk/PEER/Project.aspx (accessed 13 September 2012).
- Nicol, David, and Simon Pilling. (Eds). 2000. *Changing architectural education: towards a new professionalism*. London: E & FN Spon.
- Orsmond, Paul, Stephen Merry and Kevin Reiling. 2000. "The use of students derived marking criteria in peer and self-assessment." *Assessment and Evaluation in Higher Education*, 25(1): 23-28.
- Parnell, Rosie. 2003. "The right crit for the right project: what implications might learning objectives and ethos have for the review process?" Trigger paper at *Studio culture: who needs it? CEBE and Concrete Centre conference, Oxford*.
<http://cebe.cf.ac.uk/news/events/concrete/triggers/parnell.pdf> (accessed 10 January 2011).
- Parnell, Rosie, Rachel Sara and Charles Doidge. 2007. *The crit – an architecture student's handbook*. 2nd ed. Oxford: Architectural Press.
- Pearce, Jon, Raoul Mulder and Chi Baik. 2009. *Involving students in peer review: case studies and practical strategies for university teaching*. Centre for the Study of Higher Education, University of Melbourne. <http://apo.org.au/guide/involving-students-peer-review-case-studies-and-practical-strategies-university-teaching> (accessed 4 September 2012).
- Pond, Keith, Rehan Ul-Haq and Winnie Wade. 1995. "Peer review: a precursor to peer assessment." *Innovations in Education and Training International*, 32(4): 314-323.
- Ramsden, Paul. 2003. *Learning to teach in higher education*. 2nd ed. London: Routledge Falmer.
- Sadler, D. Royce. 2010. "Beyond feedback: developing student capability in complex appraisal." *Assessment and Evaluation in Higher Education*, 35(5): 535-550.
- Sampson, Jane, and Ruth Cohen. 2001. "Designing peer learning." In *Peer learning in higher education*, edited by David Boud, Ruth Cohen and Jane Sampson, 21-34. London: Kogan Page.

- Sara, Rachel. 2001. "Feminising architectural education? A review of current trends in UK architectural education." Paper presented at the *Architectural education exchange conference*, 11/12th September, hosted by CEBE in the Welsh School of Architecture, Cardiff University. <http://cebe.cf.ac.uk/learning/studio/conf.php> (accessed 20 September 2012).
- Sara, Rachel, and Rosie Parnell. 2004. "The review process." *CEBE Briefing Guide Series* 3. http://www.heacademy.ac.uk/assets/cebe/documents/resources/briefingguides/BriefingGuide_03.pdf (accessed 8 July 2010).
- Smith, Charlie. (2011). "Understanding students' views of the crit assessment." *Journal for Education in the Built Environment*, 6(1): 44-67.
- Stuart-Murray, John. 2010. "The effectiveness of the traditional architectural critique and explorations of alternative methods." *CEBE Transactions*, 7(1): 6-19.
- Thomas, Liz. 2012. "Building student engagement and belonging in higher education at a time of change." Final report from the *What works? Student retention and success programme*. www.heacademy.ac.uk/what-works-retention (accessed 22 August 2012).
- Topping, Keith. 1998. "Peer assessment between students in colleges and universities." *Review of Educational Research*, 68(3): 249-276.
- Topping, Keith. 1996. "The effectiveness of peer tutoring in further and higher education: a typology and review of the literature." *Higher Education*, 32(3): 321-345.
- van den Berg, Ineke, Wilfried Admiraal and Albert Pilot. 2006. "Peer assessment in university teaching: evaluating seven course designs." *Assessment and Evaluation in Higher Education*, 31(1): 19-36.
- Vaughan, David, and Mantz York. 2009. "I can't believe it's not better: the paradox of NSS scores for art and design." www.adm.heacademy.ac.uk/projects/adm-hea-projects/national-student-survey-nss-project (accessed 7 January 2011).
- Vickerman, Philip. 2009. "Student perspectives on formative peer assessment: an attempt to deepen learning?" *Assessment and Evaluation in Higher Education*, 34(2): 221-230.
- Vu, Thu Thuy, and Gloria Dall'Alba. 2007. "Students' experience of peer assessment in a professional course." *Assessment and Evaluation in Higher Education*, 32(5): 541-556.
- Webster, Helena. 2006. "Power, freedom and resistance: excavating the design jury." *International Journal of Art and Design Education*, 25(3): 286-296.
- Wilkin, Margaret. 2000. "Reviewing the review: an account of a research investigation of the 'crit'." In *Changing architectural education: towards a new professionalism*, edited by David Nicol and Simon Pilling, 100-107. London: E & FN Spon.
- White, Rosie. 2000. "The student-led 'crit' as a learning device." In *Changing architectural education: towards a new professionalism*, edited by David Nicol and Simon Pilling, 211-219. London: E & FN Spon