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When Students Become Critics: Reviewing peer reviews in theory and practice

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ABSTRACT

The design review is so embedded in the architecture curriculum that alternative approaches are infrequently – if ever – considered. This article researches student peer review through a project evaluating students' experiences of them. Attention is paid to how they compared to the traditional review, how participants valued peer feedback and how the process affected subsequent learning. The research concludes peer review to be a valuable formative feedback process, but not a replacement for traditional reviews; that they are an effective means of augmenting students' participation and agency within their learning; and offer significant value in developing critical analysis skills and self-reflection.

KEYWORDS

design review, peer review, formative feedback, student perceptions

The design review – also known as a crit or jury – is a long-standing cornerstone of architectural education.¹ Its format reflects its origins in the *École des Beaux Arts*, which moved from closed panels to open reviews at the beginning of the nineteenth century, and its perceived value as a formative and summative evaluation process embeds it centrally within the pedagogic process as a critical forum for feedback in design modules.² Yet the UK National Student Survey repeatedly shows that students are least satisfied with assessment and feedback,³ and dissatisfaction is higher than average in architecture.⁴

In his seminal book *The Idea of a University*, Newman argues that, 'A university training ... is the education which gives a man [sic] a clear, conscious view of his own opinions and judgements, a truth in developing them, an eloquence in expressing them, and a force in urging them'.⁵ Given the format and power-dynamic of the conventional design review – a nervous student standing in front of their work, facing a panel of critics seated before them, beyond whom other students passively observe the proceedings – it is questionable as to what extent it meets any of Newman's objectives. What, if anything, does the review offer as a means through which to foreground the student, and toward developing their critical and reflective thinking?

This article interweaves two methodologies to critique student peer review – where students become critics in place of their tutors – as an alternative to the traditional format. Firstly, and theoretically, by interrogating it in the context of contemporary pedagogic research, to debate its value, strengths and weaknesses in terms of learning gain and skills development, and its suitability to the contemporary higher education environment. Secondly, and empirically, through a primary research project that evaluates the experiences of architecture students involved in peer reviews; this provides understanding of how students feel about being placed in the position of critics to their peers, and what they take from the process. Particular attention is paid to how they compared to traditional design reviews, how they valued their peers' feedback, and in what manner the process contributed to subsequent creative and critical thinking – a key attribute research cites of peer review.⁶ The objective is to identify the extent to which peer reviews establish meaningful dialogue between learners, in which they are contributors as opposed to mere passive recipients, and in augmenting their participation and agency in the learning enterprise.

Background

Creating opportunities for students to develop independence in their learning is a fundamental objective of higher education;⁷ however, this has been largely overlooked in respect of feedback, which has largely remained a transmission-based activity lacking meaningful student engagement and dialogue.⁸ In recent years research and pedagogic discourse on feedback has started to move away from teachers' delivery of comments and focus on students' actions

and agency within feedback processes;⁹ at the core of these new paradigm feedback practices is students' active participation in dialogues that enable them to solicit and engage in feedback interactions.¹⁰

Fostering students' critical evaluation skills is a quintessential objective in architectural education in order that they can learn to evaluate their own work, both at university and in their professional lives. Developing students' evaluative judgement – defined as the capability to make decisions about the quality of one's own work and that of others –¹¹ entails constructing an enhanced role for students in generating and using feedback via dialogic feedback processes,¹² and providing opportunities for students to observe how self-generated judgements of work compare with those of others.¹³ Ramsden avers that structured peer review – defined here as students providing feedback to those in the same cohort –¹⁴ encourages a self-critical view in students.¹⁵

Research also suggests that peer review has numerous other attributes, many of which align closely with learning objectives in architecture. These include: fostering independent thinking, increasing the quantity and range of feedback students receive, developing an understanding of what constitutes good work (and why), developing collaborative skills, increasing confidence and empathy, encouraging deeper learning, and improved academic outcome.¹⁶ Stuart-Murray identifies student-led design reviews as showing higher levels of both engagement and understanding.¹⁷ However, peer review is not without potential challenges; for example, students may doubt the competence of their colleagues to provide feedback.¹⁸ Studies highlight that students can find it difficult to be objective and critical of their peers,¹⁹ which would create a significant problem in a creative discipline where critique is a fundamental objective of formative feedback.

Although tutors might believe that the traditional review develops students' critical thinking, it is questionable how effectively it does so. Sadler highlights that students need experience of making judgements about quality themselves.²⁰ The degree of involvement of the student audience in traditional reviews varies, but typically they passively observe from behind the tutors.²¹ In part this is due to the physical layout of the review, as tutors sitting in front of the work create an effective barrier making it difficult for peers to see the work being discussed let alone engage in the critique. Students are also reticent about contributing due to the student-tutor power dynamic,²² which they can perceive as adversarial,²³ and may not wish to openly criticise a peer in the presence of tutors.²⁴ To create conditions that help students learn, Palmer advocates a physical and conceptual learning space that is *open*, as opposed to *filled by the teacher* –²⁵ the latter being a pervasive characteristic of traditional reviews and arguably not one conducive to foregrounding the student.

There is some research exploring peer review in architecture,²⁶ however

little focuses on students' qualitative evaluation of them.²⁷ A study of studio culture finds that most architecture students perceive dialogue with their peers as important in the context of their learning, with exposure to different perspectives seen as the greatest benefit; however, fewer consider that peer feedback should be formalised.²⁸

Student peer review process

The primary research in this article involved students from a cohort of NQF (National Qualification Framework) Level 6 architecture students, in the third and final year of their undergraduate degree. At this point they were working on their final project – a twenty week design module. Following approval by the university's Research Ethics Committee, every student was invited to participate via a cohort-wide email, which gave an overview of the project and what involvement would entail. As the peer reviews would take place in self-directed study time it was important that participation was voluntary. 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.²⁹

Although this would be their first experience of peer review, encouragingly the volunteers included a well-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 peer reviews were held in a similar format to traditional reviews because one 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 an optimal model proposed for peer review.³⁰ Unlike traditional reviews in which there are often several review panels running concurrently, to manage the number of students in each cohort, the peer reviews took place as one panel of eight students. The group size was similar, if a little smaller, to that of one of the traditional review panels. If peer reviews were extended across the full cohort in this format, then they would likely also run as concurrent panels.

Two peer review sessions were held. The participants pinned up their drawings and models in the studio and were briefed on the nature of feedback to be provided. Each student described their work to the peer group – sitting in a loose semi-circle around them – who then gave feedback to the presenting student. Throughout the process the tutor sat at the back and acted purely as a facilitator, refraining from giving any feedback. Parnell suggests that students could critique work first followed by the tutor,³¹ but White considers that this might suffer from the traditional student-tutor dynamic, either reducing the perceived value of peers' comments or them being ignored in favour of the tutor feedback to come.³² The first session took place mid-way through the module and the second two weeks later, so participants had opportunity to reflect on the process and incorporate

feedback into their work. The sessions lasted between two and three hours.

F i n d i n g s

As the first session progressed there was very little need for tutor intervention. There was no set time limit for each review, and the discussion between the student presenting and their peers was deliberately allowed to be self-directing and fluid. The tutor only had to speak up to draw each review to a close and move the group on to the next, mindful that each student had parity in their time to present and receive feedback over the course of the session as a whole. The participants were strikingly forthcoming with feedback; the level of engagement from each student was very high, with no apparent reticence. Whilst some participants would be first to speak or contribute more feedback, no-one dominated the sessions. The feedback was generally of notable depth, relating to issues central to the development of the work and not just discussing peripheral matters. The level of engagement and quality of feedback suggests an answer Pearce, Mulder and Baik's question of whether students take peer review seriously if it does not count for marks – in this study, without a doubt.³³

Student evaluation of the peer reviews was conducted through a questionnaire, issued to participants following the second session. This consisted of eleven open questions, exploring aspects such as: how they compared peer with traditional reviews, the value of feedback, and the potential role of peer review; all the participants completed the questionnaire. The responses were studied anonymously through relational content analysis, from which a report was drafted summarising key concepts and responses associated with them.³⁴ The findings, below, are interrogated in the context of pedagogic research on peer review, to debate its value in terms of learning gain and skills development, and its suitability within the wider context of the contemporary higher education environment.

How do peer and traditional reviews compare?

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 does not occur in traditional reviews. The peer reviews generated a very different environment; several participants highlighted that this enabled them to articulate themselves better, 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.

Whilst responses implied that aspects of peer review are unique, equally there were qualities that participants did not get from the peer reviews that they do from traditional ones. One negative perception arose because of the open debate that they instigated. Whilst this was generally seen as positive in the sense that many ideas were generated, one participant highlighted a lack of direction at the end of the sessions. Whilst Pearce, Muldr and Baik suggest that this helps students learn to distinguish between helpful and unhelpful feedback,³⁵ it was clearly a matter of concern. Two participants considered the peer reviews to be less onerous than traditional reviews, and consequently produced less work in preparation for them. Half of the group felt 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' consensus was that peers have more empathy than tutors, and that the informal atmosphere of the peer reviews enabled them to articulate their thinking more clearly. The informality compared to 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 reviews.³⁶

Research suggests that peer review encourages higher levels of engagement, as the process of forming opinions and constructing feedback is cognitively demanding rather than passive;³⁷ the participants unanimously reinforced this. Two highlighted that in traditional reviews it is easy to become removed from the process, supporting Vu and Dall'Alba's observation that peer review promotes discursive interaction.³⁸ 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.

What is the experience of giving feedback to peers?

With just one exception, the participants felt confident delivering feedback to their peers. This is very positive, particularly given that it was direct verbal feedback in an open forum. 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. This was reinforced by others, who highlighted they felt confident for two reasons: firstly, as final year students they were more experienced and possessed greater understanding, and secondly that familiarity between the peers enabled them to give stronger feedback.

Delivering feedback directly has many advantages, such as facilitating dialogue, but this 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 peer review environment students did not feel that critical feedback would adversely affect their peers. Two participants specifically highlighted as feeling that they could give more critical feedback to peers with whom they were familiar, contrasting with Falchikov's research on peer assessment.³⁹ Nicol finds that students value anonymity in peer feedback,⁴⁰ however in this study familiarity was more important when giving more critical – and arguably more insightful – commentary. Participants recognised the mutual critique between each other, felt open-minded to new ideas, and in a position of wanting to assist each other.

Do peer reviews generate useful feedback?

A key issue was to establish the participants' opinions about the quality of feedback they received from their peers, particularly in comparison to that delivered in traditional reviews. Although one of the objectives of peer review is to develop critical analysis skills, if students do not value the feedback they receive this undermines the process. It is noteworthy that participants both respected and valued feedback from their peers; they were unanimous that it made a positive contribution to their project, answering Vickerman's question of whether students find peer feedback valuable.⁴¹ One participant commented:

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.

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. The peer review environment fostered rapid sharing of diverse ideas, and therefore the feedback had a broader scope.

In a traditional review there is normally around two or at the most, three people there. In the peer reviews we had a small group which resulted in a range of different opinions which we don't necessarily get in a traditional review.

However, two participants suggested that although the feedback was varied and diverse – which was perceived positively – it also meant that within the limited timeframe of a review it might not be as focused. One participant suggested that with peer review being a new experience they sometimes found it difficult to express points clearly and concisely, whereas tutors would be much more adept in articulating their feedback. Also, whilst the peer feedback discussed issues it did not necessarily suggest solutions in the way that a traditional review might. 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 similar findings in other studies.⁴² However, in a study where both peer and tutor feedback was anonymised, there was a similar level of acceptance between the two, suggesting that differences between them may be less than imagined.⁴³

Does reviewing work of others develop wider learning and critical thinking?

A key attribute that research cites of peer review is learning beyond that of the feedback received, developed through the process of critiquing – a powerful quality if present. For example, Nicol, Thomson and Breslin describe how the process engages students in multiple acts of evaluation and critical judgement, both about the other students' work and, in different ways, about their own.⁴⁴ Consequently, providing comments to peers is often more beneficial than receiving them because the process is more cognitively engaging.⁴⁵

Strikingly, every participant described wider learning arising from the process, which they used after the sessions. Particularly interesting is that learning varied from student to student, including: decision making, thoughtfulness, creative thinking and inspiration. 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; one participant commented:

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.

Developing critical thinking is one of the learning outcomes research associates with peer review that is most aligned to architecture programmes;

therefore, a key objective of this study was to identify the nature and extent of learning in this respect. Having to study and analyse the different projects and then provide developmental feedback on each other's work evidently facilitated thinking about similar issues in the participants' own work,⁴⁶ as this student demonstrates:

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?'

Significantly, this went beyond questioning if issues raised in another student's review also applied to a student's own project. Three-quarters of the participants made direct reference to applying the critique process to their own work as a direct result of the sessions, thus validating an increase in self-critical analysis. This supports research that suggests giving and receiving feedback in peer reviews contributes to students' subsequent self-evaluation of their own work, as the following response exemplifies:

I feel that it has helped in that its [sic] allowed me to become more self-critical of my own work. As well as this I feel it's made me more thoughtful when it comes to decision making in the design process.

Participants identified other learning from the sessions, including debating skills and presentation techniques. Amusingly, one commented on problems deciphering other students' drawings, giving them insight into what tutors express on numerous occasions during reviews! Having to critique each other revealed the need for clarity in presenting work so that reviewers can read and interpret it.

What is the role of peer review in an architecture curriculum?

There was unanimous support for peer reviews as a method for generating formative feedback. One participant commented that they didn't think colleagues give each other enough feedback, and that the peer reviews were a good platform to voice opinions on each other's work. Students already perceive peer feedback arising from informal discussions that take place in the design studio as an important part of the learning process,⁴⁷ it is, therefore, crucial that any formalisation of the process through structured peer reviews does not undermine that value.

Significantly, the participants were also unanimous that peer review is a valuable complimentary session to – but not a replacement for – traditional reviews. For example, one participant perceived them more as an advanced tutorial than a formal review; alternating peer reviews with traditional was also suggested. Like the reviews in this study, they could be supplementary events situated within self-directed study time, although Sampson and Cohen

suggest that peer review is most successful as an integral part of a course.⁴⁸

D i s c u s s i o n

McClellan and Hourigan suggest that student confidence levels inhibit many from taking a step that distances themselves from a tutor's position.⁴⁹ Webster identifies a deference in students to the tutors critiquing them in design reviews due to the power differential between them, resulting in students accepting comments even if they did not agree with or understand them; this passivity is attributed to reasons such as not wanting to look stupid in front of peers and tutors and because the reviewers are those who would assess the work.⁵⁰ Salama and El-Attar describe another response to the power differential in design reviews is students adapting their presentation to suit the interests of the particular tutors reviewing them.⁵¹ This would seemingly undermine the students' learning and their creative process.

It could therefore be inferred that students value tutor feedback in part because the tutor is the one ultimately assessing their work. Nicol, Thomson and Breslin identify peer review as facilitating diverse conversations between students on their coursework.⁵² In this respect, peer reviews could serve as a valuable way of separating formative design criticism from summative assessment, and in so doing help lead students to more explorative and independent thinking, supported by their peers.

At this institution there are typically four or five design reviews per semester for each cohort. As the volunteers in this study were in the second semester of their third year, they had participated in the traditional review process many times, and as such they had substantial experience to draw upon. Furthermore, they also had considerable exposure to the informal peer dialogue that often occurs working within the design studio, where friends and colleagues will discuss their on-going project work. This is supported by the participants' observation that familiarity with their peers directly related to their being able to give more critical feedback. From this it can be inferred that the peer reviews would be a different experience for students with significantly less familiarity of the traditional review.

As such, it could be argued that peer reviews are more suited to the latter semesters of an undergraduate course than earlier ones, as students need to develop their explicit knowledge of both subject and feedback protocols before they can build the tacit skills required by such a process.⁵³ However, in fostering students' agency, feedback literacy and engagement within feedback processes, others propose that peer feedback should be embedded at a programme-wide level, such that it becomes a core element of the course in which students are trained during their first year, and thereafter tutors reduce the scaffolding provided to support the process, and build increasingly higher levels of sophistication.⁵⁴

Peer learning can suffer problems with acceptance.⁵⁵ For example, in a study of the design review at one institution, architecture students across the undergraduate programme were asked to rank on a scale from one to five how much they learnt from different approaches to critique: individual, group, peer, panel discussion and final review; the lowest score was for peer critique, which was attributed to an absence of student-involvement culture and a perceived unreliability of the process.⁵⁶ Whilst the participants in this study were strongly supportive of peer reviews, it could be that as volunteers they were more likely to respond positively than if it were a requirement across the full cohort. However, research suggests that negative perceptions are more often associated with peer review in summative evaluations where it is perceived as a strategy to reduce tutors' marking, and it is supported much more as a way to increase formative feedback.⁵⁷ Furthermore, Boud suggests that those reluctant to participate might become keener through experience of the process.⁵⁸ Significantly, however, research also shows that students can be under-prepared for independent learning of this nature;⁵⁹ if tutors want to adopt peer reviews across their programme, they must carefully consider how they are gradually and supportively introduced.

Numerous studies advocate the provision of training before students engage in peer reviews.⁶⁰ During this study the students were briefed on the nature of feedback to be provided before the reviews began; arguably this could have been more extensive, and elaborated on the broader aims and benefits of peer reviews and ways of framing and delivering feedback. Furthermore, because effective peer feedback needs practice and experience, support needs to extend beyond initial training before the peer reviews, and include tutors modelling how to give constructive feedback, and sustained coaching during the process itself.⁶¹ Students become primed to develop their feedback literacy through peer reviews when they are coached in how to conduct it effectively.⁶² In a study on peer review of oral presentations Xu and Carless identify two interdependent dimensions necessary for peer review to be used as a feedback enabling activity: social-affective support, to build students' trust and rational attitudes toward critical feedback, and cognitive scaffolding, to develop their confidence and competence to raise questions and generate feedback comments.⁶³ An additional benefit of appropriate training is that it can address students' doubts and uncertainties over the value of peer reviews, which may not be immediately apparent.⁶⁴ Should peer review be expanded to include cohorts below the final year, then the need for such training and coaching becomes even more paramount.

Many examples of peer review in the research literature are of students providing written feedback on draft essays or reports.⁶⁵ The advantages of the format used in this study, with students providing verbal feedback, include immediacy, opportunity to ask questions, providing explanation and elaboration, and negotiation of meaning. In a study of peer feedback with mixed modes of both written commentary and verbal dialogue students cite an important part of the feedback process being the verbal dialogue, as it

facilitates deeper consideration of the coursework and enhances evaluative skills and learning efficacy.⁶⁶

Furthermore, the trend of using peer review for evaluation of draft essays raises potential opportunities to broaden the application of peer review in architecture programmes by extending it to other parts of the curriculum. In contrast to the formative feedback in design studio through tutorials and reviews, essays often only receive summative feedback following submission. Applying peer review to essays as well as design projects would have several advantages: increasing students' familiarity with the process of giving feedback, providing them with formative feedback on coursework for which they might not ordinarily receive it, and creating more coherency in feedback between different aspects of the curriculum.

A discrepancy in gender ratios between volunteers for the study and the cohort is worthy of discussion. The peer review group was composed of eight students, one female and seven males – a ratio of twelve percent female and 88 percent male; this is very different to the gender ratio of the cohort, which was 36 percent female and 64 percent male. It is not clear why this occurred. If it was due to female students' unease at the prospect of reviewing or being reviewed by their peers, thus hindering them from volunteering, then it could have serious implications on the wider application of peer review.

Research on gender in peer review is inconclusive. In a study of peer assessment of oral presentations, therefore not unlike this study but for the fact that the work was assessed as opposed to given feedback, Langan and others find that the male student assessors tended to award slightly lower marks to female peers, but that female assessors were more consistent and their marks were unaffected by the presenter's gender.⁶⁷ Topping reports a study which found that male peer tutored students achieved higher Grade Point Averages than non-tutored male students, but that female students did not.⁶⁸ However, this contradicts the view of Boud, Cohen and Sampson that peer learning can foster greater respect for the varied backgrounds of participants, and that collective forms of learning may better suit women and those from minority backgrounds than more individualistic learning and teaching practices.⁶⁹ In calling for a reassessment of pedagogical conventions in architectural education, Sara argues that qualities traditionally considered to be feminine – such as empathy and collaboration, negotiation and enabling – are undervalued in the existing mainstream model; arguably, however, each of these qualities can be nurtured and facilitated through peer review, as evidenced in the participants' responses above.⁷⁰ A participant in one study on the traditional design review at another UK architecture school identifies the process as a particularly masculine model of professional department, and describes as objectionable the way it discriminated against those who, for reasons of gender, race or culture, could not or would not conform to the professional model; criticisms echoed by other students in the study.⁷¹ Therefore, the issue may not lie with the fact that the process involved student

peers, but with the design review format itself.

C o n c l u s i o n s

One of the most significant qualities of peer review is the dual-aspect of learning that takes place: primarily, the development of critical analysis skills through reviewing peers, and secondarily the formative feedback received about project work from peers. The participants' involvement clearly benefitted their critical thinking, where heightened awareness subsequently caused them to appraise and question their own work. They identified significant wider learning in addition to the feedback received; this is supported by research which finds peer review to benefit both reviewer as well as reviewee.⁷²

The participants were generally positive about the quality of feedback received from their peers, although half suggested that tutors give deeper insights, and would have raised issues their peers did not. They were unanimous both in their support of peer review as a part of the learning process, but also in seeing them as supplementary to traditional reviews. Contrary to existing research, most participants did not find giving critical feedback to their peers awkward. The peer reviews created a different environment, 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.

It must be highlighted that the sample size in this study was small – eight students from a cohort of 71 – and therefore, along with the gender imbalance within the group, any conclusions must be treated with a degree of caution. However, the very high incidence of unanimous responses indicates robustness. Taking the participants' responses collectively, there is strong validation of peer review as a valuable pedagogical strategy. They are clearly an effective means of foregrounding students within the learning enterprise, both through establishing meaningful dialogue between learners – one in which they are active contributors as opposed to mere passive recipients – and in augmenting their participation, agency and critical thinking.

As described above, the peer reviews were held in a similar format to traditional design reviews, with the student presenting their work standing in front of a seated panel of their peers. In part this was because one objective was to evaluate how students compared the two; but also, it was reasoned that providing feedback to their peers would be a novel experience without further complication of a new format. However, research suggests that students can find this format challenging. For example, one study at another UK architecture school identifies the design review as eliciting feelings of fear, humiliation and failure – a situation exacerbated by the spatial configuration and choreography of the review process;⁷³ similarly, a study of student perceptions of the design jury in Egypt and Saudi Arabi, which has been

imported from pedagogic practices in Europe and the United States, reveals that students can find the traditional review to be intimidating, hostile and adversarial.⁷⁴

Increasing students' agency through actively engaging and interacting in the feedback process has become a focal point of new paradigm feedback practices in higher education.⁷⁵ A further dimension through which this could manifest in peer review would be to enable the students to have their own say in the format of the session, such as their spatial configuration, how the students present their work to each other, or receive their feedback. Topping reports a study on cross-year small group peer tutoring in which interviews with tutees yielded many reports of reduced anxiety and more confidence.⁷⁶ Providing more opportunities for students to direct their learning would increase their sense of agency in the process, and could address students' reticence in participating due to the peer reviews conforming to the format of traditional design reviews. A study on alternative formats for peer feedback in the design studio could also explore if the disparate gender split between the peer review group and the cohort was attributable to the peers reviews themselves or because they adopted the same format as traditional design reviews. This would be an insightful aspect of peer reviews to be explored in further research.

Another dimension of further research would be to compare peer review across different cohorts. For example, as design reviews are frequently used across both Degree and Masters programmes, further study could evaluate students' views in both undergraduate and postgraduate levels. Huisman and others advocate a longitudinal approach to research on peer reviews that would study development of students' peer review skills and their attitudes toward the process, proposing that a culture could be nurtured in which peer review is increasingly accepted and normalised as students become more skilled and accustomed to the process through iterative engagement across the levels.⁷⁷ Evans suggests that impact on students' performance from their involvement in peer review may have a period of incubation, in which the benefits may not be immediately apparent.⁷⁸ Such a study would demand programme-wide adoption of peer review, so that students' perceptions and learning outcomes can be charted as they move through each year. Whilst students already have exposure to the informal peer dialogue that occurs within the design studio, this will likely take place with friends and colleagues with whom there is an established level of trust – an important facet to nurture in peer review.⁷⁹ A longitudinal application of peer review may better socialise students to trust and value peer feedback.

In a study such as this one, where students volunteered to participate in the peer review process, it would also be informative to survey other students in the cohort to identify reasons for them choosing not to engage in the reviews. This would provide understanding that could subsequently allay concerns that inhibited them from participating.

In her study on the traditional design review Webster concludes that while the process is very effective in inculcating students into the rituals of the discipline, it is questionable whether a pedagogy so insistent on the reproduction of particular paradigms can be equated with student-centred learning.⁸⁰ Steen-Utheim and Wittek highlight that a key objective of dialogic feedback is to enhance students' growth through collaborative processes with others, and requires a fundamental shift in the power balance between student and tutor, without which feedback is simply traditional and transmissive.⁸¹ Peer review could be one strategy to diversify the design review experience, foreground student engagement and influence in their learning, and create a much more student-centred environment.

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