

# DEVELOPING TEAMWORK SKILLS: AEC STUDENTS WRITING REFLECTIVE JOURNALS AND USING ACTION RESEARCH

Henning Grosse<sup>1</sup>

*School of Business and Technology, University of Gloucestershire, Oxstalls Lane, Longlevens, Gloucester, GL2 9HW, UK*

Construction is a collaborative endeavour. Therefore, AEC students should learn to critically reflect on interpersonal issues and how they act in teams alongside their technical and scientific training. I teach the required skills and knowledge to attain this, within a master's level course in green building design at a German university, which revolves around a training project. Students design a building in interdisciplinary teams. First, I encourage the students to develop a project schedule and assign responsibilities. Subsequently, they use an action research approach to improve their project management skills. They keep a personal reflective journal throughout the project, enabling them to critically reflect on how they perform individually and how they interact as a group. This journal writing helps them to identify problems and subsequently improve their practice by employing action research. Therefore, my account of how to engage AEC students in critical reflection reveals the challenges and opportunities of this process. Students on my course can struggle to identify the value of reflection and hence problematising their practice. They grab the most readily available solution to their organisational problems without more in-depth investigation. Often tight project schedules restrain their willingness to reflect and make it hard to get them engaged. However, after overcoming initial obstacles, they start to write and use their insights to feedback into their action research projects. Conflicts in the teams are particularly challenging for the students but also unique learning opportunities.

Keywords: action research; feedback; reflexivity; teamwork; project teams

## INTRODUCTION

The aim of the paper is to demonstrate how action research and learning journals might help students acquire skills and knowledge to foster learning in their later professional career is. Within a multidisciplinary master's course in green building design, I introduced students to critical reflection or reflexivity. To achieve it, I encouraged students to use action research methods to improve their project management practice and write a learning journal to actively reflect on their practices.

Although a prominent topic in construction management research (e.g.; Kanjanabootra and Corbitt 2016), critical reflection or reflexivity has attracted little attention within the curriculum of architecture engineering and construction (AEC) students. The primary focus within the ACE courses lies in technical knowledge, as is the case with

---

<sup>1</sup> hgrosse@glos.ac.uk

the course I teach. The teaching of project management is often side-lined and concentrates on technical features (Nijhuis, Vrijhoef and Kessels 2018). Even so, management in general, but project management in particular, will be a significant part of my students' future jobs. Moreover, management is a profoundly social activity. Hence, soft or interpersonal skills are essential.

## **BACKGROUND**

The master's course I am involved in runs over three semesters, followed by one semester preparing a master's thesis. I teach two successive modules which deal with project management and teamwork in interdisciplinary teams spanning the first two semesters. The students hold a bachelor's degree in architecture, civil engineering, building equipment, facility management, landscape architecture or other closely related engineering degrees. Some of them have work experience in the construction sector, some work part-time, but there are also students entering the course without any practical experience in the construction sector.

The two courses resembled a student project for each semester, which included designing a student dormitory during the first semester and turning a public library into an office facility during the second semester. The students were assigned to interdisciplinary groups of five or six students, of which at least one student of each group has previously studied architecture, civil engineering and building equipment. The student project was conceptualised to integrate the knowledge of the different disciplines. To succeed, it was important for the groups to consist of at least one member from each of the disciplines mentioned above. As the name Green Building Design suggests, strong emphasis was laid on sustainable design.

Interdisciplinary teamwork is considered a significant part of the curriculum. The students had to design the student project, which included almost all other modules in one or the other way. Therefore, students were required to work in interdisciplinary teams throughout the whole course over three semesters. One of the leading ideas behind the course was to learn from different disciplines. Emmitt and Ruikar's assertion reflects this idea: "To be effective [...], the construction design manager will also need to understand how designers and engineers work and be able to communicate effectively across a broad spectrum of organisations and levels. This calls for a collaborative approach, excellent interpersonal ('soft') skills, and the ability to make informed decisions on a strategic and operational level" (2013: 6). These "people skills, such as diplomacy, negotiating, coordinating, communicating, integrating, and organising are central to the design management role." (2013: 58)

Within the module, I concentrated on the personal side of management. My colleagues dealt with the technical and engineering skills in other modules or learned them by themselves. As a result, I often had the feeling that they were well equipped to deal with technical issues. Yet, they were unfamiliar with social science methods, not to mention qualitative research and practice approaches.

### **Design and Aim of My Module**

Project management in higher education often covers only a minor part of the curricula (Nijhuis 2017). So too did the module I taught, and it was assigned an auxiliary or supportive role in the curriculum. Hence, my main aim was to teach competencies and behaviours "that enable managers to develop independently and continuously within their role." (Dainty, Mei and Moore 2004: 883). This enabled them to learn some general competencies of project management and acquire specific

competencies in their jobs (Nijhuis, Vrijhoef and Kessels 2018). Therefore, I used two separate but supplementing concepts: action research/learning (Reason and Bradbury 2008, Revans 2016) and learning journals (Moon 2006).

I asked students to keep a personal reflective journal in which they took notes about their experiences in their teams. I encouraged them to write about thoughts and emotions and about what triggered these thoughts and feelings. Subsequently, I urged them to ask themselves intriguing and uncomfortable questions, why they acted, thought, and felt to lead them towards deeper reflection (Moon 2006). The journal was to help the students observe themselves in action and subsequently sensitise them to their personal interactions and other group members. I actively encouraged them to draw on experiences made outside of the university to understand the patterns of acting and thinking more thoroughly.

The journal also served a second purpose closely related to action research. The observation and reflections helped the students to identify actions to improve their project management. Journal writing was meant to clarify the “objective” of the action, serve as an analysing or “fact-finding” tool, as well as a means to plan actions (Lewin 1946).

### **Triggering and Maintaining the Process**

During the first semester, students were given different activities in order to develop a project plan for their design project. The first activity consisted of planning their project work according to Allen’s (2015) Natural Planning Model. They had to define the purpose, envision the outcome, brainstorm ideas and action, organise actions, and finally define the next actions (Allen 2015). In a later activity, they had to schedule the different task and actions they had defined before.

These activities helped the students to get their project work running. Here the module fulfilled its supportive or auxiliary role to the main design project. I sought to support the students to achieve their best performance and asked them critical questions to clarify their goals and problematise issues in their teams and their work. During our bi-weekly online meeting, I provided feedback on the activities, and we discussed how to proceed. Often these discussions took longer than planned and took surprising twists and turns because we touched interpersonal issues and problems neither I nor the students had anticipated.

These issues resembled the necessary soft skills I sought to teach students. To develop these interpersonal skills, I repeatedly encouraged students to reflect on their teamwork and question their assumptions critically. The vehicle is the project and their teamwork. To foster their reflection, students were asked to tackle problems within their teamwork using an action research approach. This action research approach was an option for the students to learn a methodology which Dainty, Mei and Moore (2004) call for and which they might use in the future to learn and develop independently.

Action research and journal writing have a particularly good fit. Action research forces the students to take action, into moving things forward, although it also entails observing and reflecting on action. Here AEC students put action in the foreground. However, learning journals encourage the students to recall, record, observe and reflect, which is less action driven. The students are taken out of the heat and put in a calm spot to think about what had happened and what they have done, only to be thrown into new actions later (Heidegger 1927) and to use their earlier reflections.

At the start of the second semester, I asked them to identify problems or themes about teamwork they had stumbled over in the first semester. Therefore, they had to individually consult their learning journals and identify themes and discuss them in their groups. Subsequently, they had to select up to three themes and prepare a brief action research proposal. This proposal was the basis for a student-led learning design during the semester.

I supported the students again through bi-weekly feedback, discussions and planning. In this way, I sought to offer them guidance and help them with thoughts and literature on their investigated topics. For grading, the students had to prepare a personal or a group paper. During the semester, I offered them feedback on a draft version of the paper. Through my feedback, I sought to give them additional food for thought. The draft also enabled me to understand their learning progress better and adapt my teaching in the following meetings.

One particular challenge was studying and teaching remotely. Due to the ongoing COVID-pandemic, we had to meet via online meeting tools such as Jitsi, Microsoft-Teams or Zoom, throughout the period. Students relied almost entirely on synchronous and asynchronous online communication tools. Yet interpersonal skills were more challenging to teach as, according to Ellis, Thorpe and Wood (2003: 139), “softer interpersonal skills were best dealt with in face-to-face class sessions.” Although online communication tools have significantly improved since 2003, not meeting in person and enjoying the full range of in-person communication remained an obstacle and was regularly lamented by students. However, whether and how the COVID restrictions affected their learning is beyond this paper’s scope.

## **METHODS**

I collected qualitative material in three ways. Initially, I wrote field notes during and after meeting the students in our bi-weekly online sessions. First, I took brief jottings and developed them later into broader accounts of the events or conversation I participated in.

I also drew on the formative and summative papers the students submitted. I found vivid accounts of their changing thinking in these. I provided feedback on their formative assignments predominantly in the form of questions, hints for further thoughts, and reading suggestions. These papers also provided impressions of the students’ difficulties with writing reflectively. I continuously asked the students for feedback on my teaching, predominantly because I sought to improve their learning experience. This feedback also provided me with insights into their learning and their struggles with critical reflection as a side-effect.

Finally, once the second semester was finished, I asked several students to participate in an unstructured interview. Two students participated in one-to-one interviews and another two students took part in a group discussion. These interviews could be best described as guided conversations, where I raised some topics but sought to let the students talk. Occasionally, our conversations drifted away from the interview's initial aim but often offered me exciting takes on the lectures that I had not had before.

## **RESULTS AND INTERPRETATION**

In the following section, I will report on the process, starting with the first semester of teaching. Subsequently, I will present my findings regarding the learning journals and then focus on the action research. Finally, I will wrap up my interpretations of what

the students learnt over the course and what challenges the students and I faced throughout this process.

### **Natural Planning Model**

Allen (2015) suggests that the process of a Natural Planning Model is to define an aim, envision an outcome, brainstorm ideas, organise them, and identify the next actions. Completing these activities helped the students kickstart their work on the project itself and in my module. Very soon, they knew what to do next; they had actions or tasks to be fulfilled and knew who was responsible for the delivery.

I soon noticed that the students mainly focussed on what they should submit as a project file to the tutors and disregarded the fact that the project was a mere vehicle to foster their learning. They prioritised delivering an excellent design to earn them a good grade rather than focussing on the learning experience. I asked one group why they were working on the project. The initial response was to design a sustainable student home. I insisted their “best learning experience” could also be a viable objective of the project. Their intriguing response was something like, “oh, we hadn’t thought about the project this way.”

One could reference an allegory often used in counselling in which the counselled is metaphorically asked to “go onto the balcony” in a theatre and see themselves acting on stage (Ury 1992: 11). Once the counselled has seen themselves acting, their acting changes through the new perspective. In some way, this was a game-changer for the students. Once they realised the potential learning for themselves, they had another intrinsic motivation apart from delivering an excellent design and the extrinsic motivation of achieving a good grade.

The approach of these engineering students also demonstrated a way of thinking similar to what Antonacopoulou (2010) addressed to managers: they were focused on immediate problem-solving rather than problematising. In this situation, I probably wore the researcher's hat and problematised their project's possible objective. Yet, it was an exercise to drag the student away from the problem-solving mode. Only later did I learn that problematising, as I often do, caused resistance within the students.

### **Journal Writing**

Journal writing was only a familiar task for a very few students who had written diaries before. The majority of students were very unfamiliar with this sort of writing. Additionally, it appeared that most engineering students preferred to capture and communicate their thoughts through drawings and calculations rather than written texts. Hence, they showed some hesitance or resistance to the task. During the meetings, they often admitted to having not written much in their journals. They cited different reasons; for example, ‘I didn’t have enough time’, ‘I was too tired after long hours of working’, ‘I forgot to write’ etc.

It may be tempting to call these reasons cheap excuses. One student later even referred to laziness as the root cause of not writing. However, I think this is short-sighted. During the interviews, but also in informal conversation, the students said they did not know what to write. I told them repeatedly to write what moved them during the meetings, what made them feel strongly, what they enjoyed. Essentially, I urged them to write what they wanted and to understand what that meant to them. However, they were not used to writing that freely, and I had severe difficulties overcoming this reluctance.

Motivation to write is a big issue. I am not sure how to tackle it. Coercion through formal assessment is somewhat tricky. Moon (2006) cautions us of the effects when journals are assessed directly. It often leads students not to write freely. They restrict what they write because they fear being judged on their journal writing. For that reason, I told my students that I would not assess the journals directly from the outset. However, some students still continued asking whether I wanted to see their journals, which I, of course, denied.

The whole point of writing the journal is that students are provided with a tool to develop personally. Hence, they must have ownership of it; it must be their private space to think. Therefore, forcing the students to write becomes counterproductive. As a tutor, one can only highlight the benefits and perhaps offer personal examples of journaling to motivate students to follow my advice and example.

Despite the difficulties (and after lengthy discussions), some did start writing. First, they used it to memorise meetings. One student recounted that he wrote notes after meetings and ahead of the next meeting to structure his thoughts much better. Hence, he first adopted quite a technical use of the journal. This observation does not come as a surprise, but it appears to be a way of breaking the deadlock. After a while, most students wrote at least occasionally. Some wrote after the meetings, others once a week, and some even wrote daily. Some wrote and never consulted their previous writing again; others reread the written passages later to learn about shifting perceptions. Some noted that they stepped into the shoes of team members and tried to adopt their perspectives. One engineer attempted to understand the architects in their group better. One student sought to anticipate what it meant to be a parent of a 3-year-old during lockdown.

Despite the positive progress during this phase, I repeatedly emphasised that I would not assess the journals. Still, one set of questions, among many, constantly surfaced: “Is this appropriate to write? Is this worth noting? Am I doing it right?” I answered, “It’s fine if it helps you.” Students were not satisfied with this answer. It offered them too little advice. They were used to tutors telling them whether they are right or wrong. But I did not, and I could not. They had to learn to see by themselves.

The difficulty is getting the students away from these judgemental questions. Because they wonder about rightness and appropriateness, they often do not write. Yet, the writing from the very beginning can never be wrong. The students need to write to start a more profound thinking process. Even when they got into writing, hindering questions or expectations still remained. Two students mentioned that they wanted to question more, would have liked to go deeper, and felt superficial. They thought this, although they did very well, and their level of reflexivity in writing and thinking exceeded that of most other students.

One of the most significant challenges of critical reflection is that it has no logical endpoint (Moon 2006). The deeper one digs, the more questions one asks, the more challenging and uncomfortable the questions become. Critical reflection or reflexivity is best when it challenges its own roots, when everything starts moving along with the question one asks. This raises the question of when reflection is sufficiently deep. In the case of engineering students it seems enough when they get a sense of ‘unstable ground’, since it gives them a feeling of what they can expect from critical reflection and what it can offer.

Students commonly reported that this approach - writing a reflective journal which contains feeling and emotions - was something they did not come across during their

engineering studies and was not what they expected from a course in project management. It was utterly new, which added to their reluctance to write. However, once they overcame these obstacles, it turned out to be of considerable value for the students. The example of one student is representative of several accounts. This student reported that he learnt to manage his emotions better. He observed himself being less impulsive than before. He could “go to the balcony” (Ury 1992), and he entered the scene again in a much calmer mood.

Still, through writing, this student reported becoming much more aware of looming problems. Subsequently, he became more proactive in addressing issues that could later turn into conflicts. Hence, here is a development visible from pure reactive problem-solving to early problematising (Antonacopoulou 2010). It shows that this student was able to use “forms of knowledge” which “do indeed complement each other” (Bartunek 2007: 1328)

### **Action Research**

After the project commenced and the students had their schedule, tasks, deadlines, and next actions ready, I asked them to identify issues that could be improved. I used the word “problems”, and to this day I regret using the word. One student replied “We have no problems, and even if they’re so small we solved them immediately. No need to reflect.” That was the day I saw my whole concept for the lecture dissolve.

Other students were not as dismissive. However, the reluctance to search for problems prevailed. There was little appetite from them to ask critical questions about their project management practice. They did not immediately see the value in thoroughly investigating actual problems and had even less appetite to search for potential problems. Here again, the mindset of researcher and practitioner clashed (Antonacopoulou 2010, Bartunek 2007). However, after some feedback with the “no-problem” group and many challenging questions, some minor issues surfaced, which helped to keep the module up and running. Some other groups willingly explored their issues, including communication techniques, feedback methods, ways to update meeting minutes, etc. As the project developed, more issues grew in importance and increased the students’ appetite to explore them.

Although I hoped they would work on their project, observe, reflect, plan changes to the working routine, execute them, and subsequently learn to work more effectively and efficiently (Kolb 2015). Instead, the students increasingly seemed to drown in their project work. Hence, they were less and less interested in critically examining their project practice. This also highlights a structural problem of action research: it is the circularity that seems counterintuitive to apply to a project - because a project is a one-off situation. Here, the growing demands towards the project's due date increased the pressure on the students and did not allow for the repeated interventions. However, some issues repeat themselves, namely, jour-fixe meetings in teams, repeated feedback, etc.

Such repeating issues were the focus during the second semester. At the beginning of this semester, the students were assigned to new teams. In these new teams, they prepared the action research proposals and started their actions research. They sought to explore issues, for example, giving feedback, sharing information, everyday working routines. The questions were similar to what they had already asked in the first semester. However, this time they were more familiar with the idea of doing action research and reflecting in their journals.

One common issue the students raised in the interviews at the end of the second term was a lack of structure. Some found it very disturbing, even demotivating. One student recounted that if other team members had not kept her on board, she would have completely lost motivation to work in this module, whereas the others in her group enjoyed “the freedom to do what they wanted”. This highlights a danger within this mode of student-led learning. Some students appear to need more guidance than others. For these students, a tighter “scaffolding” to support their learning and research process seems to be necessary (Kolb 2015 drawing on Lev Vygostky). I did not realise this problem when it occurred in the student because the rest of the group covered me. I only learnt about it during a later interview. Still, this is a risk one needs to keep in mind. Another student also mentioned the lack of structure. She recalled others complaining about having little clarity about where the action research process should lead. She did reasonably well and could deal with the open-ended design. Others she recounted had more difficulties. Interestingly, although the two students mentioned the lack of structure, their respective teams delivered outstanding results.

Other groups had internal conflicts, including how much each contributed to the teamwork, keeping deadlines, responding to questions, and teammates' demands. These groups discussed their conflict in my feedback session because it was one of the few places, they felt they could raise such issues. In these cases, I sometimes felt overwhelmed with the task of mediating their problems. In retrospect, however, it was a great learning opportunity for me.

Three students from a conflicting group approached me for an extra conversation. They told me that they realised they had to take over the leadership of the team. These three were not satisfied with the work of the other team members. In the end, we concluded that they needed to move things forward. They met for informal meetings between the three of them and thought about distributing the tasks ahead. Through this reflection, they took over an informal leadership role in their team without patronising the other members. Subsequently, tasks were complete on time, and they could successfully submit their design.

Within these conversations, the students understood that a leadership role was required to finish the project. We clarified that this sort of leadership might be needed from them in their future roles. Although they were very reluctant to take on the position in the first place, they gained confidence and saw the value of their leading position. These students even gave the impression that they did not consider themselves as managers. One might argue a great deal of their work is designing, drawing, calculating etc. Yet chances are high that these students will one day supervise builders, contractors, and co-workers; they will communicate and negotiate with clients, partners, contractors and staff on building sites. After leading the group, the students realised that this could be a significant part of their future roles.

A student of another conflict-ridden team only occasionally responded to other team members emails and messages. But once this student replied, he promised to deliver on the tasks given to him. Only weeks later, the others learnt that he had not. The students had a great learning opportunity regarding managing an almost screwed up project, and I was supposed to assist them. At the same time, they faced severe ethical dilemmas as to whether to kick this student off the team or not. At the same time, I encountered another difficulty as a tutor - I saw the students' potential learning from the conflict. However, they reasonably feared terrible grades in other subjects because



of it. They were distracted from the project work and had one team member who did not deliver. Naturally, they spent little effort in doing action research but concentrated on keeping their project running.

This conflict shows that action research is a risky business. Conflicts in the groups can severely undermine this approach. In such cases it is very demanding for the tutor to keep the group motivated and focussed on the action research. However, team members for one group (which went through a severe conflict in the first term) enjoyed working in a new group much more afterwards and did everything to make the group work well. Through the conflict and reflecting on it, they clarified how they wanted a team to work. They spent considerable effort in action research - making teamwork fun for the group and creating a sense of community despite COVID restrictions. They even developed the habit of meeting for breakfast online to experience more closeness.

These reflections clearly show that students - critically analyse their needs, communicate them and search to satisfy them. So, they tried out NVC methods (Rosenberg 2015) and could find a way to improve their lives mutually. It is hard to identify how deep their understanding of critical reflection or reflexivity goes. However, they took their experience, reflected on it, abstracted, planned and acted as Kolb (2015) describes in his experiential learning model.

## **CONCLUSIONS**

Since project management is often assigned only an auxiliary role in AEC course curricula, action research and journal writing can provide students with essential tools to develop management skills. Writing journals helps them to organise thoughts and to reflect on the project management practice. Hence, they begin to question their actions and thinking. They adopt new perspectives and critically observe themselves. In other words, they acquire tools to begin a personal development process, which might help them to adopt to new roles and task in their future careers. In particular, they realise the social aspect of building which is beyond right-and-wrong-schemes. However, often special effort is needed to motivate them to start and to keep them writing journals. The lack of structure and clear guidance about journal writing (and action research) might be particularly challenging for AEC students used to well-defined goals. Yet once they realise the benefits, it becomes easier for them to maintain the habit of writing.

Using an action research approach within a curriculum around a student team project can yield very insightful outcomes and foster a deep learning experience. Students tackle problems they are concerned with during their project work. They learn a methodology which uses personal experience to gain deeper insights into managing not only construction projects and to kickstart a personal development process. However, conflicts within the student teams can derail the action research. Being witness to students' conflicts and their emotional suffering was very demanding for me as tutor. Sometimes, I felt overwhelmed by the situation they brought into my seminar. Still, I could offer some guidance, or at least an outsider's perspective which helped them to reframe their thinking and move forward. Nevertheless, conflict in teams offers unique opportunities for the students to learn about project management and interpersonal skills.

Keeping learning journals and using action research the students investigated issues relevant to their team's daily work and acquired knowledge and skills they might use in future teams.

## REFERENCES

- Allen, D (2015) *Getting Things Done: The Art of Stress-Free Productivity*, New York: Penguin Books.
- Antonacopoulou, E P (2010) Beyond co-production: Practice-relevant scholarship as a foundation for delivering impact through powerful ideas, *Public Money and Management*, **30**(4), 219-26.
- Bartunek, J M (2007) Academic-practitioner collaboration need not require joint or relevant research: Toward a relational scholarship of integration, *The Academy of Management Journal*, **50**(6), 1323-33.
- Dainty, A R, Mei, I C and Moore, D R (2004) A competency-based performance model for construction project managers, *Construction Management and Economics*, **22**(8), 877-86.
- Ellis, R, Thorpe, T and Wood, G (2003) E-learning for project management, *Civil Engineering*, **156**(3), 137-41.
- Emmitt, S and Ruikar, K (2013) *Collaborative Design Management*, Abingdon, UK: Routledge.
- Heidegger, M (1927) *Being and Time*, Oxford, UK: Blackwell.
- Kanjanabootra, S and Corbitt, B (2016) Reproducing knowledge in construction expertise: A reflexive theory, critical approach, *Construction Management and Economics*, **34**(7/8), 561-77.
- Kolb, D A (2015) *Experiential Learning: Experiences as the Source of Learning and Development Second Edition*, Upper Saddle River, NJ: Pearson .
- Lewin, K (1946) Action research and minority problems, *Journal of Social Issues*, **2**(4), 34-46.
- Moon, J A (2006) *Learning Journals: A Handbook for Academics, Students and Professional Development Second Edition*, London, UK: Routledge.
- Nijhuis, S, Vrijhoef, R and Kessels, J (2018) Tackling project management competence research, *Project Management Journal*, **49**(3), 62-81.
- Nijhuis, S A (2017) Exploring project management education, *European Journal of Social Science Education and Research*, **4**(1), 44-61.
- Reason, P and Bradbury, H, Eds (2008) *The Sage Handbook of Action Research: Participatory Inquiry and Practice Second Edition*, Thousand Oaks, CA: SAGE.
- Revans, R W (2016) *ABC of Action Learning*, Abingdon, UK: Routledge.
- Rosenberg, M B (2015) *Nonviolent Communication: A Language of Life Third Edition*, Encinitas, CA: Puddle Dancer Press.
- Ury, W (1992) *Getting Past No*, London, UK: Century Business.